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FACULTAD DE CIENCIAS JURIDICAS Y DE LA EMPRESA

Departemento de Ciencias Sociales, Juridicas y de la Empresa

Competitive advantage by Customer integration. - Empirical investigation by the example of German manufacturers of Baggage Handling Systems -

Autor:

Uwe Schindler, MBA

Directores:

Prof. Dr. Marco Zimmer

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AUTHORIZATION OF THE DIRECTOR OF THE THESIS FOR SUBMISSION

Prof. Dr. Thomas Schmidt and Prof. Dr. Marco Zimmer as Directors[1] of the Doctoral Thesis "Competitive Advantage by Customer Integration - Empirical investigation by the example of German manufacturers of Baggage Handling Systems -" by Mr. Uwe Schindler in the Departamento de Ciencias Sociales, Jurídicas y de la Empresa, **authorizes for submission since it has the conditions necessary for his defense.**

SIGN, TO COMPLY WITH THE ROYAL DECREES 99/2011, 1393/2007, 56/2005 Y 778/98, IN MURCIA, SPAIN, 10.07.2016.

Prof. Dr. Thomas Schmidt

(Murcia, September 21, 2016)

Prof. Dr. Marco Zimmer

(Hamburg, September 21, 2016)

[1] If the thesis is directed by more than one Director must noted and sign both.

PREFACE

To develop a competitive advantage and to defend it as successfully as possible over a long period is usually part of firms' most important survival strategies. But this is more difficult if they have to compete in markets where they do not or cannot distinguish themselves sufficiently and by tangible factors from their competition. In such markets, the relationships between the players and thus the intangible factors become of crucial importance. To remain competitive, German manufacturers of baggage handling systems (BHS) are forced to use innovative methods of shaping the relationship with their customers. Therefore, it is the goal of this doctoral thesis to examine whether customer integration is a suitable approach for German manufacturers of BHS to achieve competitive advantages.

On the one hand, the idea for writing this doctoral thesis was born through my professional development and many years of working for manufacturing firms that deal with the BHS at airports and intralogistical conveyor systems.

On the other hand, the idea was supported by my diploma studies at the FOM – Hochschule fuer Oekonomie & Management, as well as by the topic of my diploma thesis, which dealt with customer integration in key account management. I would particularly like to thank my teacher for sales management and supervisor of my diploma thesis, the attorney Mr. Tobias Gros, who introduced me to the topic of customer integration, which henceforth accompanied me both professionally and scientifically.

I would also like to thank Prof. Dr. Mercedes Carmona-Martinez, UCAM Universidad Catolica San Antonio de Murcia, Spain, as well as Dr. Maria Huggenberger and Mrs Maike Seidel from FOM - Hochschule für Oekonomie & Management, Essen, Germany for all of the administrative work surrounding my doctoral thesis.

The two supervisors of my doctoral thesis significantly contributed to the success of my dissertation. Therefore, I thank Prof. Dr. Thomas Schmidt, UCAM Universidad Catolica San Antonio de Murcia, Spain, for the given support during the entire time and the opportunity and necessary freedom to write my dissertation according to my ideas.

I am most and deeply grateful to my supervisor Prof. Dr. Marco Zimmer, FOM – Hochschule für Oekonomie & Management, Hamburg, Germany. During the entire time Prof. Dr. Marco Zimmer was my scientific mentor, who was both patient and a motivating, challenging and critical scientific discussion partner. Without him my project would not have been feasible.

Finally, and by far the greatest thanks are due to my wife Iren and my two children Lisa and Fabian. I thank them for all their support in recent years, for the confidence in me, for their optimism, understanding and moral support. Without the support of my family, this doctoral thesis would not have been possible. To them I dedicate this work.

To Iren, Lisa and Fabian

- Backing and source of power of this doctoral thesis' success -

DISCLAIMER

Various publications in the fields of customer integration and achieving competitive advantages were produced before and during the course of this dissertation (e.g. Schindler, 2007; Schindler, 2014; Schindler, 2015).

The contents of these publications and the doctoral thesis at hand may overlap to a certain degree.

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LIST OF ABBREVIATIONS

a. M.	am Main (GER) = upon Main
ACI	Airport Council International
ADV	Arbeitsgemeinschaft Deutscher Verkehrsflughäfen e.V. (GER) = Working Group of German Airports
ATM	Air traffic movement
B2B	Business-to-business
BayObLG	Bayerisches Oberlandesgericht (GER) = Bavarian Higher Regional Court
BC	Before Christ
BDM	Business Development Manager
BGBl	Bundesgesetzblatt (GER) = German Federal Law Gazette
BHS	Baggage handling system
BMVBS	Bundesministerium für Verkehr, Bau und Stadtentwicklung (GER) = Federal Ministry of Transport, Building and Urban Development
BMWi	Bundesministerium fuer Wirtschaft und Technologie (GER) = Federal Ministry of Economics and Technology
BoM	Bill of Material
CA	Competitive advantage
C_a/C_b	Customers' responses according to Interpretation
C_a/M_b	Customers' requirements and expectations of the manufacturer
CAs	Competitive advantages
Cf.	confer (Latin) = compare or bring together
CI	Customer integration
Cp.	Compare

DCV	Destination coded vehicle
DFS	Deutsche Flugsicherung (GER) = German Air Traffic Control
(ed.) / (eds.)	editor / editors
e. V.	eingetragener Verein (GER) = registered association
e.g.	exempli gratia (Latin) = for example
EC	European Community
et al.	et alii (Latin) = and others
etc.	et cetera (Latin) = and the other
EUGH	Europäischer Gerichtshof (GER) = European High Court
Fig.	Figure
FMG	Flughafen München GmbH
fn.	Footnote
Frequ.	Frequency
GER	German
GPA	General Procurement Agreement
GWB	Gesetz gegen Wettbewerbsbeschränkungen (GER) = Act against Restraints of Competition
HAM	Hamburg Airport
i.e.	in example
IATA	International Air Transport Association
ibid	also there
ICAO	International Civil Aviation Organization
ICE	International Electronical Commission
IMF	International Monetary Fund
IT	Information technology
KAM	Key Account Manager
LBA	Luftfahrtbundesamt (GER) = German Federal Aviation Authority
LuftVG	Luftverkehrsgesetzt (GER) = Air Traffic Act

LuftVZO	Luftverkehrszulassungsordnung (GER) = Air Traffic Licensing Act
M_a/C_b	Manufacturer´s requirements and expectations from the customer
M_a/M_b	Manufacturer´s responses according to Interpretation
MBV	Market-based view
MERIT-CATI	Maastricht Economic Research Institute on Innovation and Technology - Cooperative Agreements and Technology Indicators database
mn.	Marginal note
n. i.	no information
no.	Number
OECD	Organisation for Economic Cooperation and Development
OEM	Original equipment manufacturer
OLG	Oberlandesgericht (GER) = Higher Regional Court
P	Passenger, Passengers
p. / pp.	page / pages
p.a.	per annum (Latin) = annually or per year
PIMS	Profit Impact of Market Strategy
pt.	Point
R&D	Research & Development
R1	Rater 1
R2	Rater 2
RBV	Resource-based view
RCP	Resource-conduct-performance
RFID	Radio Frequency Identification Devices
RV	Relational view
SCA	Sustainable competitive advantage
SCP	Structure-conduct-performance
SDR	Special Drawing Right

SektVO	Sektorenverordnung (GER) = Ordinance Regulation
SITA	Société Internationale de Télécommunications Aéronautiques (FR) = International Society of Aeronautical Telecommunications
SME	Small and mid-sized enterprise (s)
SWOT	Strengths, Weaknesses, Opportunities, Threats
Tab.	Table
USD	US Dollar
VAT	Value Added Tax
Verg	Vergabe (GER) = award
VgV	Vergabeverordnung (GER) = Public Procurement Ordinance
VK	Vergabekammer (GER) = Public Procurement Tribunal
VOB	Verdingungsordnung für Bauleistungen (GER) = Contracting Regulation for Building Works
VOF	Verdingungsordnung für freiberufliche Leistungen (GER) = Contracting Regulations for the Awarding of Professional Services
VOL	Verdingungsordnung für Leistungen (GER) = ContractingRegulation for the Awarding of Works or Services
VOL/A	Verdingungsordnung für Leistungen, Teil A (GER) = Contracting Regulation for the Awarding of Works or Services, part A
VRIN	Valuable, Rare, Inimitable, Non-substitutable
VS	value step
WTO	World Trade Organisation
yrs.	Years

1 INTRODUCTION

1.1 THE RELEVANCE OF THE TOPIC FOR TODAY´S BUSINESS IN THE FIELD OF BHS

Achieving strong and unique competitive advantages is a goal in the strategic management of customer relations. Sustainable successful relationships to customers to secure profitable business in the face of growing competition are among the most important challenges for firms. In order to remain competitive in the future, German manufacturers have to force the application of innovative state-of-the-art methods to develop competitive advantages to attract and bind customers and to differentiate themselves from their competitors. This is of special relevance under conditions where their products alone are insufficient for the purpose. Such conditions also exist in industries which are crucial for the infrastructure and the care of a state and are of national interest and strategic relevance.[1] Especially commercial airports have to provide a logistical service for the carriage of passengers and luggage and are of strategic importance. The growing share of transfer passengers faces the airports with logistical challenges. Thus, the overall costs to the industry for mishandled baggage worldwide are approximately USD 2.4 billion (SITA, 2015: 6).[2] Complex engineered Baggage Handling Systems (BHS) that are customized to the requirements of the airport, promise a reduction in the share of mishandled luggage and a cost reduction, but also require close cooperation between the system manufacturer and the airport in order to ensure the manufacturer's success a competitive tendering process. The integration of the airport into the value creation of the manufacturer is a method to support such a goal. It involves the customer in the core processes of the manufacturer, so that his role in the process changes, voluntarily or involuntarily, from the passive recipient to an active co-designer of the

[1] Cf. Subchapter 8.6.1.

[2] Cf. in detail Subchapter 8.4.

achievement (Xue and Harker, 2002: 253-255).[3] This goes hand in hand with the interchange of knowledge between the customer and the manufacturer, down to the active participation in the manufacturing process. Especially strategic networks (e.g. with lead users)[4], the interchange of information and inter-firm relationships influence the success of the integration and the achievement of competitive advantages (CAs).

The dissertation at hand deals with the question of achieving competitive advantage through the integration of customers in the value creation from the perspective of the baggage handling system manufacturers. It shall investigate and answer the central question of this research:

Is customer integration (CI) a method that can be applied by German manufacturers of Baggage Handling Systems (BHS) to achieve a competitive advantage?

Airport baggage handling projects require highly specific customized solutions. They may need to combine a customized adaptation of existing technical solutions and the development of equipment and services that let the customer perform its core business. The dissertation discusses selected approaches to the application of strategic management in order to survey and to answer the research question, and mirrors it with success factors of CI in combination with technical and legal aspects. In order to answer the research questions sufficiently this dissertation also contains argumentations and results of my Diploma thesis "Kundenintegration im Key Account Management"[5] (Schindler, 2007) presented at the FOM Fachhochschule für Oekonomie and Management, Hamburg in 2007 as well as aspects and argumentations from my contribution presented in the yearbook 2014 of the UCAM-FOM Doctoral School of Business under the title "Competitive advantage under the condition of homogeneous products: Producing inhomogeneity by customer integration"

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[3] Cf. Wecht (2005; 2006). A simple example is the self check-in at an airport, where the customer takes over achievement shares from the provider in the form of log-on or checked baggage.

[4] Cf. von Hippel (1986).

[5] Translation from GER by the author: "Customer Integration in Key Account Management".

(Schindler, 2015). The theoretical discussion will be underlined by a qualitative empirical investigation that is an essential part of this dissertation and includes the manufacturer and customer perspective and provides an answer on the research question.

1.2 OBJECTIVES AND ORGANIZATION OF THE RESEARCH

The goal of this thesis is to discuss the problem on the basis of the above description and a theoretical discussion of strategic views. This is combined with a qualitative empirical investigation to present the achieved findings on whether CI is a suitable or unsuitable instrument for German manufacturers to achieve CAs under conditions of the baggage handling industry. In order to investigate the described problem the thesis proceeds according to the following description:

As a part of the introduction of chapter 1, Subchapter 1.1 deals with the description and necessity of the problem that is to be investigated on the basis of this research thesis, and presents the central question of the research. On this basis Subchapter 1.2 presents the objectives and the organization of the research (Figure 1) in order to answer the research question. Subchapter 1.3 completes the introduction with a demarcation of the terms applied in the dissertation.

Chapter 2 deals with the term and the formation of CAs. Subchapter 2.1 presents the relevant status of research; Subchapter 2.2 focuses on the formation of CAs by economic rents, whereas Subchapter 2.3 focuses on mechanisms to measure CAs. Subchapter 2.4 deals with the meaning of competitive advantages for the success of a firm, and Subchapter 2.5 presents the closer relation to the topic of the thesis.

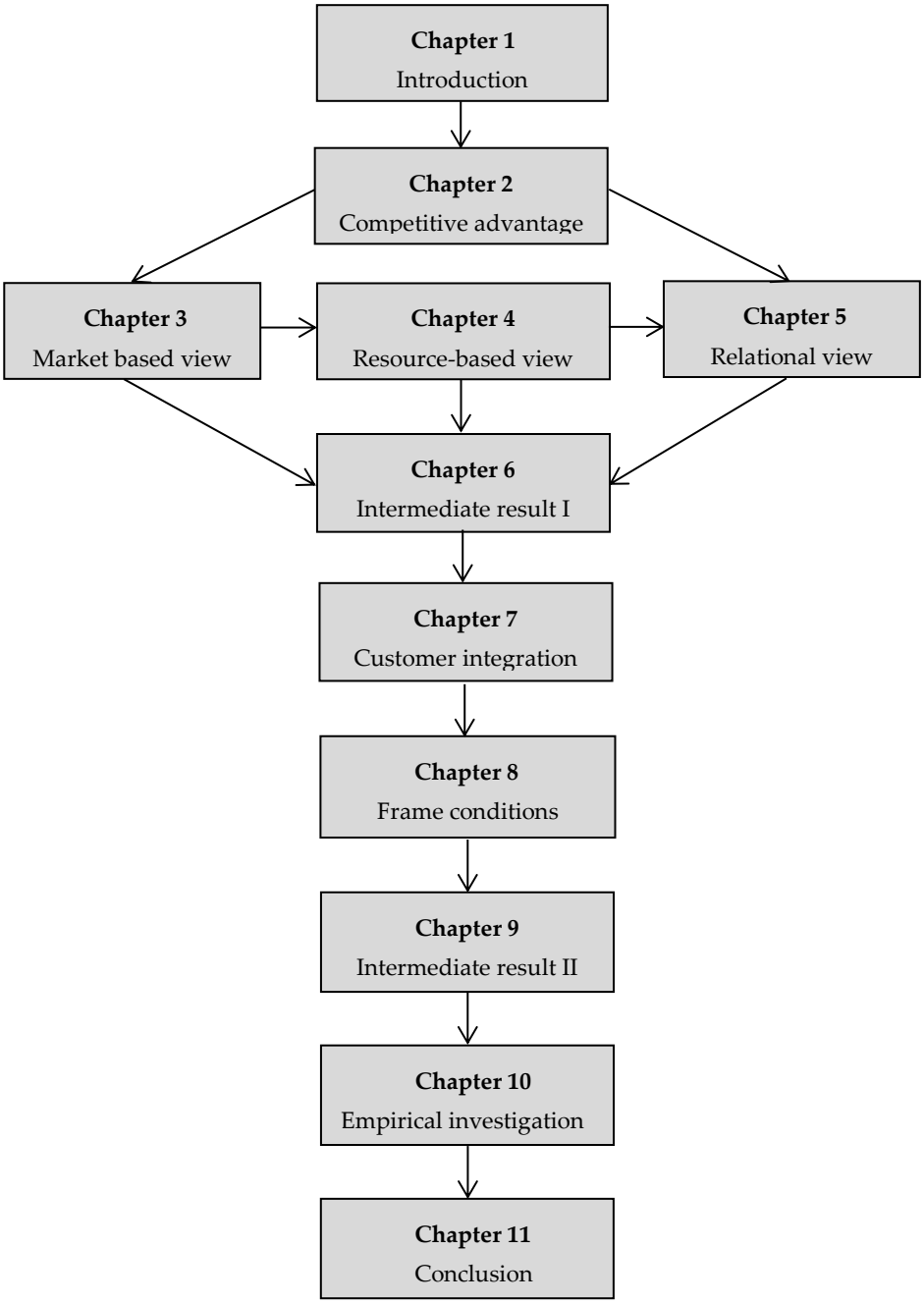
Chapter 3 deals with the Market-Based View (MBV) as the first of the three strategic views which will be discussed in the thesis. Beginning with a determination of the position and the status as a part of strategic management, Subchapter 3.1 deals with the meaning of mobility barriers, entry- and exit barriers, and strategic groups related to the context of the topic. Subchapter 3.3 follows with a contemplation of the competitive forces. Subchapter 3.4 proceeds with a thematic discussion on generic competitive strategies. Subchapter 3.5 contemplates the MBV from a critical perspective, provides an outlook on further research and completes chapter 3.

Chapter 4 deals with the Resource-Based View (RBV), which is differentiated from the MBV in Subchapter 4.1. Subchapter 4.2 discusses thematically conceptual conditioned relationships between the terms resources and capabilities as well as between core competences and cooperation. Subchapter 4.3 deals with the factors for success of efficient resources and focuses especially on the strategic value of resources, rareness, immobility, none-imitability, and limited substitutability. Subsequently, Subchapter 4.4 discusses resource characteristics in connection with sustainable competitive success and Subchapter 4.6 addresses the comparison between RBV, the neoclassic, and the transaction cost theory. Subchapter 4.6 provides critical aspects, an outlook on further development and completes chapter 4.

Chapter 5 deals thematically with the Relational View (RV) and differentiates it from RBV and MBV in Subchapter 5.1. Subchapter 5.2 discusses the meaning of inter-firm networks as a basis for CAs and relational rents. Subchapter 5.3 focuses on the sources of relational CAs. In this connection Subchapter 5.3 deals with relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and effective governance. Subchapter 5.4 discusses barriers to imitate relational rents with a view to the interconnectedness of inter-organizational assets, partner scarcity, indivisibly, and the meaning of the institutional environment. Subchapter 5.5 completes the discussion of the RV by mentioning some critical aspects and provides an outlook on the further development.

Chapter 6 presents an intermediate result as a summary of the previously discussed strategic views.

FIGURE 1: Course of Investigation



Chapter 7 deals with CI and begins with its classification, relevance and basic principles. Subchapter 7.2 discusses some characteristic aspects of CI, such as achievement dimensions, process types, and the points and forms of the integration. Subchapter 7.3 proceeds with discussing the stages of CI, followed by Subchapter 7.4 with a brief thematic discussion on the meaning of the Lead User (LU) concept in relation to the topic of this thesis. Subchapter 7.5 discusses important fundamentals which are strategically necessary for success, as well as fundamental key factors, followed by Subchapter 7.6 that focuses on special guidelines for successful CI. In this context process orientation, the avoidance of dissipation, the necessity of early gaining information and knowledge processes, process awareness, the increase of deterministic process shares, and the factor of integration will be discussed. These success factors will be also relevant for the evaluation and the interpretation of the empirical results in chapter 10. Moving on, Subchapter 7.7 presents a comparison with other forms of binding customers; Subchapter 7.8 discusses the chances and risks of the approach, and Subchapter 7.9 completes this section with an outlook on CI in the further course of the thesis.

Chapter 8 provides a deeper understanding of the preconditions faced by firms that act in the special baggage handling industry. Subchapter 8.1 revolves around the introductory fundamentals of the industry, followed by Subchapter 8.2 that presents the passenger air traffic in Germany and Subchapter 8.3 that provides an overview of airport-specific logistical processes. A description of baggage handling logistics as a key factor for airport competitiveness is provided in Subchapter 8.4, followed by a detailed introduction of the baggage handling process in order to provide an understanding of the various complex technical components and systems in Subchapter 8.5. In providing an overview of the key conditions of the industry, it is also necessary to discuss the relevant legal preconditions in chapter 8. Therefore, Subchapter 8.6 presents the relevant legal preconditions German firms face in this industry. The chapter starts with a demarcation of relevant terms and the legal basis. It continues with a legal classification on the example of the FMG (Flughafen München GmbH), followed by an overview about of the procurement procedure and the related schedule. The last two Subchapters, 8.6.6 and 8.6.7 complete the legal part of chapter 8 by means of a discussion about specifications and technical requirements, while also drawing attention to the chances to achieve CAs through legal uncertainty.

Chapter 9 presents an intermediate result as a summary of chapters 7 and 8.

Chapter 10 addresses empirical investigation and describes the methodological basis, the guidelines, and the sample. Subchapter 10.4 evaluates the answers of the experts, distinguishing between the manufacturer experts and the airport experts. Both groups focus on the main categories: market, CA, CI, and relationship and completes this subchapter with a intermediate summarization of relevant findings. Subchapter 10.5 provides the interpretation of the evaluation, divided again into both groups, with a focus on the key success factors of CI. The interpretation is followed by Subchapter 10.6 that provides a comparison of the expert groups and discusses the similarities and differences between them. Subchapter 10.7 presents a comparative summary of the results.

Chapter 11 completes the dissertation by a conclusion that contains of a the presentation of the relevant results in Subchapter 11.1, which provides the results of the empirical investigation and answers the central research question. Subchapter 11.2 summarizes the results and hands-over to Subchapter 11.3 for a critical appraisal. Subchapter 11.4 finishes the dissertation with the provision of a recommendation for further research.

1.3 DEMARCATION AND USE OF TERMS

In this thesis, different terms are used interchangeably in the course of the discussion. The term customer is used synonymously with the term airport, which is the customer of the manufacturer of BHS within the scope of the thesis; therefore it is regarded as a supplier of the baggage logistics service.

The term OEM, or manufacturer of BHS, also includes those manufacturers that combine their own system with subsystems of other manufacturers so that the combination of the individual systems results in a customized total system.

A project in the context of this thesis is "eine zeitlich befristete, relativ innovative und risikobehaftete Aufgabe von erheblicher Komplexität, die aufgrund ihrer Schwierigkeit und Bedeutung meist ein gesondertes Projektmanagement erfordert“[6] (Wirtschaftslexikon Gabler, 2015). In reference to

[6] Translation from GER: “a temporary, relatively innovative and risky task of considerable complexity, which usually requires a separate project

the context of this doctoral thesis, the point of starting a project is different from the perspective of the customer and that of the manufacturer. The different starting point is based on the internal starting point of the customer, as the customer is usually active in the project before the manufacturer is informed and starts to work. That means the project starts at the manufacturers', but following the time perspective the project starts with the customer, and the at earliest when receiving the information about the existence of a project.

Under the terms achievements and products this thesis also includes such products, achievements, services and their preparation which are not directly paid for by the customer and for which the customer has no direct objective to pay. In the context of the thesis this means that customer and manufacturer work together in non-contractual ensured cooperation on achievements (e.g. system specifications) which will probably be paid after the manufacturer is awarded the project.

Furthermore, this thesis defines product homogeneity in the context of complex customized conveyor systems as follows: homogeneity is achieved when several manufacturers are committed on the basis of specific customer specifications, a BoM or equivalent technical specifications, to offer a service that is technically equivalent to the specifications (cf. §7 SektVO).

With regard to the legal framework, references are made to the Sector Regulation (SektVO) in the course of this work. When not otherwise explained in the text, the GWB and the SektVO are understood as the legal basis to be applied for such sector applications in this thesis.[7]

The values mentioned in the context of the empirical study were presented in the form (x, y). Here, x corresponds to the frequency of mention, while y corresponds to the respective percentages of the responses, based on the number of respondents from the respective expert groups. Due to the size of the sample a direct correlation of the values of the same or another response category cannot be concluded. In this context very low frequencies (e.g. 1) mentioned can be

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management due to its difficulty and importance" (Wirtschaftslexikon Gabler, 2015).

[7] See in detail Subchapters 8.6.3 and 8.6.5.

necessary if this is relevant for the argumentation and supports the answering of the research question. A correlation result from the overall context as a part of the evaluation and interpretation stages of empiricism. Therefore, it is only set a value on the recording and designation of the relevant content and the corresponding pair of values in the context of thesis.

During the dissertation (e.g. chapters 10 and 11) certain terms (e.g. shows, presents or similar to that) are used for the evaluation, discussion and interpretation of frequencies and are only related to the evaluation on hand related to a selected group of experts and are not to understand as a generally valid statement.

The thesis at hand uses references previously published by the author (see also the disclaimer).

2 COMPETITIVE ADVANTAGE

Chapter 2 of the thesis deals with the emergence of CAs.[8] In addition to ensuring sales, profits, market share and growth the achievement of CAs creates added value for firms. In the literature, there are numerous articles that deal with the generation and preservation of CAs. However, there is no vision determined by a common term.

Therefore, Subchapter 2.1 will determine the concept and focus on an overview of relevant literature contributions. It posits that the formation and expression of CA can be discussed depending on the ingested perspective, e.g. market-based, resource-based or based on relationships. These perspectives will be discussed in detail later on in the thesis[9]. Particularly the relational perspective is of crucial importance in this thesis. For example, the exchange of knowledge among the actors, the relationships between firms as a resource for achievement combination, innovation, networking, and the achievement of trust and adherence to commitments among actors are essential for the RV. The thesis will present how the focus of the considerations changes from tangible to intangible resources. It will also present that intangible assets, like trust, loyalty and reputation are immobile resources, which cannot be purchased or built in the short term. Relationships that base on these resources create a mobility barrier for potential suppliers and enable the creation of sustainable resource-based CAs.

Subchapter 2.2 deals with the cause and the development of CAs by means of economic rents. In order to build CA firms must be able to generate stable economic rents. They can be differentiated as Ricardian rents, Monopoly rents, Entrepreneurial rents, and Pareto rents (Mahoney and Pandian, 1992: 364). Zimmer (1999: 110) states that the existence of a rent is subject to market failure, because at perfect markets exists transparency among the market participants with regard to their resources and capabilities. Therefore, at least heterogeneity among market participants must exist, as they may have access to different

[8] Cf. Schindler (2015: 158-164).

[9] Cf. the discussions in Chapters 3, 4 and 5.

resources and capabilities (Rasche, 1994: 55). Peteraf (1993: 186) goes a step further and presents four conditions that must all be met so that enterprises can achieve rents and generate CA. These conditions are: heterogeneity in order to generate Ricardian or Monopoly rents, ex-post limits to competition in order to sustain the rents, imperfect factor mobility in order to sustain the rents within the firm, and ex-ante limits to competition in order to offset the rents from the competition.

Subchapter 2.3 then discusses possibilities for measuring CAs. There is no common valid scale *per se* for the measurement of competitive advantages of firms from a customer focused and competition focused perspective. Additional investigation of the presented methods and techniques in further research seems appropriate.

Subchapter 2.4 shows what sets companies apart from their competitors and, if necessary, how this can be established. The basis will be the customer-oriented as well as the competition oriented perspective. This follows the goal to obtain information about the quality of in-house resources and achievements compared to the competitors. The crucial point here is how the customer perceives and evaluates the achievements.

Subchapter 2.5 presents the closer relation to the topic of the thesis. Based on the criterion of heterogeneity, it discusses an example of how, e.g. under the conditions of the legal framework of public tenders that force relative homogeneity among suppliers of BHS[10], heterogeneity and thus a symbiotic

[10] The term system can be defined as "a complex of interacting elements (…) Interacting means that the elements stand in a certain relation, R, so that their behaviour in R is different from their behaviour in another relation, R' " (von Bertalanffy, 1950: 143). Backlund (2000: 444) defines "A system is a set of interacting units with relationships among them." A technical definition characterizes a system as "Menge untereinander in Beziehung stehender Elemente, die in einem bestimmten Zusammenhang als Ganzes gesehen und als von ihrer Umgebung als abgegrenzt betrachtet werden können" (IEC 60050, 2013) (Translation from GER by the author: number of related elements which in a specific context can be seen as a whole and delimited form their environment).

benefit for supplier and customer can be achieved in attaining sustainable CAs and relational rents.

2.1 DETERMINATION OF THE TERM – STATUS OF RESEARCH

Fritz et al. (1988: 571) state that typical economic objectives, such as revenue, profit, market share and growth, are no longer the only dominant objectives for firms. Ensuring corporate survival, quality and competitiveness and the generation of CAs are also crucial goals of highest importance and possibly essential for the survival of a firm in a market (Fritz et al., 1988: 575). The following six tables present an overview about relevant literature related to the topic.

TABLE 1a: Contributions to the concept of competitive advantage, part 1

Author (date)	Article / Book title	Summary of main contribution
Alderson (1965)	The Search for Differential Advantage	Precursor to CA, proposes three bases for differential advantage: technological, legal, geographical; four strategies for achieving differential advantage: segmentation, selective appeals, transvection, differentiation.
Hedley (1977)	Boston Consulting Group Approach to business portfolio	Discussion about the importance of CA as strategic goals.
Hall (1980)	Survival strategies in a Hostile environment	Successful companies will achieve either the lowest cost or the most differentiated position.

Source: adapted from Hoffman (2000: 3-5); extended

TABLE 1b: Contributions to the concept of competitive advantage, part 2

Author (date)	Article / Book title	Summary of main contribution
Henderson (1983)	The Anatomy of Competition	Continues the discussion of unique advantages of a firm over competitors; the firms that can adapt best / fastest gain an advantage over competitors.
Porter (1985)	Competitive Advantage: Creating and Sustaining Superior Performance	Introduction of the value chain idea as the basic tool for the analysis of the sources of competitive advantage.
Coyne (1986)	Sustainable Competitive Advantage: What It Is, What It Isn`t	Explanation of the conditions needed for sustainable CA to exist; capability gaps idea.
Ghemawat (1986)	Sustainable Advantage	Discussion of advantages that tend to be sustainable: size in the targeted market, superior access to resources / customers, restriction on options from competitors.
Day and Wensley (1988)	Assessing Advantage: A Framework for Diagnosing Competitive Superiority	Potential sources of advantage are superior resources; in assessing ways to achieve sustainable CA, competitor and customer perspectives should be considered.
Stalk jr.(1988)	Time- The Next Source of Competitive Advantage	He discusses the relevance of time (speed) as an intangible asset for achieving sustainable competitive advantage on the basis of practical examples.
Dierickx and Cool (1989)	Asset Stock Accumulation and Sustainability of Competitive Advantage	The sustainability of an asset position of a firm is based on how easily assets can be substituted or imitated by competitors.
Hamel and Prahalad (1989)	Strategic Intent	A firm should not search for a sustainable CA, instead it should learn how to create new advantages to create global leadership.

Source: adapted from Hoffman (2000: 3-5); extended

TABLE 1c: Contributions to the concept of competitive advantage, part 3

Author	Article / Book title	Summary of main contribution
Prahalad and Hamel (1990)	Core Competencies of the Corporation	Sustainable CA result from core competencies; firms should consolidate their resources and skills into competencies that allow them to adapt quickly to changing opportunities.
Barney (1991)	Firm Resources and Sustained Competitive Advantages	Discussion of four potential indicators of the potential of firm resources to generate sustainable CA: value, rareness, inability to be imitated, imperfect substitution.
Conner (1991)	A Historical Comparison of Resource-Based-Theory and Five Schools of Thought within Industrial Organization Economics: Do We Have a New Theory of the Firm?	With a RBV to achieve above-average returns, a firm product must be distinctive in the eyes of customers, or the firm selling an identical product in comparison to competitors must have a low-cost position.
Peteraf (1993)	The Cornerstones of Competitive Advantage: A Resource-Based View	Discussion about four conditions which must be met to achieve sustainable CA: superior resources (heterogeneity within an industry), ex-post limits to competition, imperfect resource mobility, ex-ante limits to competition.
Bharadwaj, Varadarajan, and Fahy (1993)	Sustainable Competitive Advantage in Service Industries: A Conceptual Model and Research Propositions	Sustainable CA evaluated in a service marketing context; an sustainable CA exists only if it is recognized by customers.

Source: adapted from Hoffman (2000: 3-5); extended

TABLE 1d: Contributions to the concept of competitive advantage, part 4

Author	Article / Book title	Summary of main contribution
Hall (1993)	A Framework Linking Intangible Resources and Capabilities to Sustainable Competitive Advantage	Identification of various intangible resources (including assets and competencies) that allow firms to possess relevant capability differences which result in sustainable CA.
Day and Nedungadi (1994)	Managerial Representations of Competitive Advantage	A firm´s use of strategy and reaction to the environment depends on its orientation (customer-oriented vs. competitor-oriented); CA is based on this orientation.
Hunt and Morgan (1995)	The Comparative Advantage Theory of Competition	Compares neoclassical and comparative advantage theory of the firm; comparative advantage of the firm can translate into a CA in the marketplace; offers categorization of resources. Source of CA: financial, physical, legal, human, organizational, informational, and relational.
Oliver (1997)	Sustainable Competitive Advantage: Combining Institutional and Resource-Based Views	Proposes a model of firm heterogeneity which suggests that both resource capital and institutional capital are indispensable to sustainable CA.
Srivastava, Shervani, and Fahey (1998)	Market-based Assets and Shareholder Value: A Framework for Analysis	Delineates market-based assets into two primary types: relational and intellectual. Largely intangible, these assets may be leveraged to achieve sustainable CA if they can add unique value from customers.

Source: adapted from Hoffman (2000: 3-5); extended

TABLE 1e: Contributions to the concept of competitive advantage, part 5

Author	Article / Book title	Summary of main contribution
Ma (1999)	Creation and Preemtion for Competitive Advantage	CA arises from differences along any dimension of attributes and characteristics of a firm that allows it to create better customer value than others do. Sources of CA include ownership of assets or position, access to distribution and supply, and proficiency (knowledge, competence, capability) in business operations. In addition a firm needs creativity and proactivity to exploit the generic sources.
Mazzarol and Soutar (1999)	Sustainable Competitive Advantage for Educational Institutions: A Suggested Model	Studies the structure, strategy and CA and outlines a model of factors that are critical to the establishment and maintenance of CA. Variables are conceptualized as industry and market structure: quality image, market profile, coalition formation, forward integration, expertise, culture, and information technology.
Ma (2000)	Competitive Advantage and Firm Performance	Makes three observations regarding CA: CA does not equate to superior performance, CA is a relational term, CA is context-specific and explores various patterns of relationships between CA and firms' performance: CA is leading to superior performance, CA without superior performance, superior performance without CA.
Gupta and McDaniel (2002)	Creating Competitive Advantage by Effectively Managing Knowledge: A Framework for Knowledge Management	Study about knowledge management and CA which investigates the link between the management of knowledge and the development of sustainable CA in contemporary organizations. Variables are: organizational effectiveness, efficiency, core competency, costs, knowledge harvesting, filtering, configuration, dissemination, and application.

Source: adapted from Hoffman (2000: 3-5); extended

TABLE 1f: Contributions to the concept of competitive advantage, part 6

Author	Article / Book title	Summary of main contribution
Lin (2003)	Technology Transfer as Technological Learning: A Source of Competitive Advantage for Firms With Limited R&D Resources	Discusses technology transfer as a possibly significant source of CA for firms with limited resources in R&D, and conceptualizes in eight terms: technological learning performance, organizational intelligence, causal ambiguity, firm specificity, complexity, maturity, employee qualification, innovation orientation.
Goh (2004)	Enhancing Organizational Performance through Knowledge Innovation: A Proposed Strategic Management Framework	Discussion about knowledge management as the next source of competitive advantage.
Ma (2004)	Toward Global Competitive Advantage: Creation, Competition, Cooperation and Co-option	Advanced an integrative framework on the determinants of CA in global competition about: creation, innovation, competition, cooperation, co-option.
Cousins (2005)	The Alignment of Appropriate Firm and Supply Strategies for Competitive Advantage	Study focused on strategy and CA which discovers that firms defining their CA as being cost-focused will generally tend to a cost reduction supplier role (e.g. passive, supportive). Firms viewing their CA as differentiated see supply as strategic (e.g. distinctive capability). Measured variables are business development related, market share, relationship development, cost, focus, differentiation, collaboration.
Liao and Hu (2007)	Knowledge Transfer and Competitive Advantage on Environmental Uncertainty: An Empirical Study of the Taiwan Semiconductor Industry	Investigation about the inter-relationships among environmental uncertainty, knowledge transfer, and CA, conceptualized as: ambiguity, complexity, partner protectiveness, organizational knowledge transfer, group and procedural movements, reduce dependency, knowledge transfer effect, technology development, and technology transfer.

Source: adapted from Hoffman (2000: 3-5); extended

As Sloan (1963: 49) states, achieving returns is a strategic business objective that is essential in order to secure the long term existence and the survival of a company. It is the basis of entrepreneurial thinking to achieve CAs that allow the firm to generate above-average returns compared with its competitors in the same industry. Generating these advantages, and securing them as the basis for above-average market success, has a key position in strategic management (Day and Wensley, 1988; Wolfrum and Rasche, 1994; Faix and Goergen, 1994; Simon, 1988). According to Gordon (1959), CAs develop if a firm has lower opportunity cost[11] in creating achievements than its competitors. Grant (2000: 174) defines as follows: "When two or more firms compete within the same market, one firm possesses a CA over its rivals when it earns a persistently higher rate of profit (or has a potential to earn a persistently higher rate of profit)". Bourgeois et al. (1999: 56) defines CAs as "the set of factors or capabilities that allows firms to consistently outperform their rivals". Simon (1988: 464) describes CAs in terms of their effectiveness toward customers as the completion of superior performance that must fulfill three main criteria:

a) it must relate to an important achievement feature for the customer,

b) be consciously perceived by the client and

c) the advantage must be permanent and not compensated by the competition in the short term.

Porter (1986: 21-22), however, considered a CA from an economic perspective within a specific industry sector and in terms of their effect on the competition. From Porter´s perspective firms can gain a CA if they differentiate from the competition from the customers' perspective by offering an achievement advantage, and thus are able to charge a higher price, or can offer an equivalent achievement more cost-effectively or on a more competitive level. Meffert (1994: 137) states that contrary to Porter's perspective, according to Simon a CA occurs if

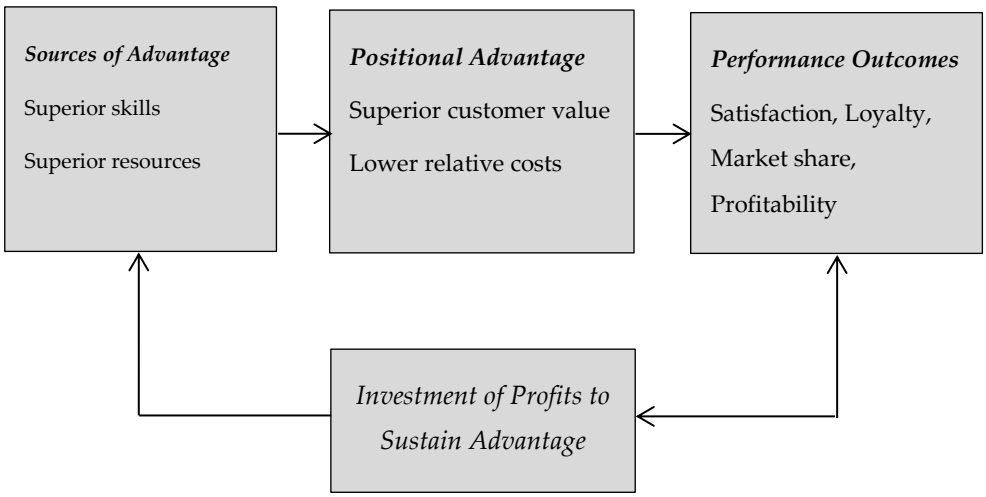
[11] Usually the term is defined as the value of a resource at its next best use. Peteraf (1993: 184) uses the term in her discussion concerning the generation of rents in a different way (cf. Subchapter 4.3.2): "(…) the value of the resource to its second-highest valuing potential-user. (…) This difference between the value of a resource to a firm and its opportunity cost is also a form of rent."

it leads e.g. to a price advantage for the customer and results in a pricing demarcation from the competition. However, this means that with the same achievement of several competitors, a cost advantage according to Simon is passed on as price advantage to the customer. The customer accepts the price advantage as such and must therefore distinguish the offering firm from the competition. If an achievement is at least equal compared to the competition (or almost equal or homogeneous), a cost advantage must, according to Porter (1986: 33-34; Walley and Thwaites, 1996: 164), not necessarily be passed on to customers in the form of a lower price and can also remain in the firm in order to realize a larger profit margin compared with the competition. This would also have an impact within the firm as a cost advantage. While an achievement advantage in the market acts directly when perceived by the customer, a cost advantage acts only indirectly and if the additional profit is used for the generation of achievement advantages. Contrary to Porter and Simon, Day and Wensley (1988: 19-20) consider the distinction of CAs according to cost or achievement leadership as insufficient. Figure 2 presents their model, which considers the content and the impact of CAs. According to that model, sources of advantage are superior to proprietary firm-owned resources and capabilities that generate a positional advantage, a situational advantage, and in consequence a performance outcome that can lead to positive results in the market. In turn these are used for re-investments (investments of profits) in superior resources and capabilities that can help to maintain a CA.

Day and Wensley (1988) argue that the value of an achievement actually perceived by the customer and the associated costs for the preparation of this performance are the crucial dimensions for determining the form of CAs. Both are described as follows: on the one hand the value of the performance from a customer perspective compared to the competition as a direct resource / capability input that creates a value directly perceived by the customer, and on the other hand as costs that are associated with it compared to the competition (costs for input of resources and capabilities). Porter (1992: 4-16) argues further that operational effectiveness alone cannot achieve a sustainable CA. Operational effectiveness means to perform similar activities better than rivals (Dess et al., 2005). Dess et al. (2005) follow Porter´s argument by arguing that operational effectiveness measures, like just-in-time, business process engineering, etc. do not

lead to sustainable CA, for the simple reason that everyone is doing them (other firms could imitate this) and it would be necessary to be different from others.

FIGURE 2: Model of competitive advantage



Source: adapted from Day and Wensley (1988: 3)

That means that attaining a sustainable CA is only possible through performing different activities from the rivals or performing similar activities in different ways (Dess et al., 2005). Porter (1980) sees CAs as the center of a company´s performance in competitive markets. Porter (1980) argues further that a CA in an industry occurs when companies are able to create advantages by using generic strategies, if the advantage exceeds the costs incurred for its creation. In his approach, achieving CA means achieving low costs, advantage by differentiation or using a focused strategy.[12]

Peteraf (1993: 179-191) instead argues that a CA is sustained "above normal returns". Such superior returns are rents[13] which occur under specific conditions.

[12] Increasing diversification vs. a focused strategy leads to less concentration on core competences, less efficiency, and in consequence to lower averaged rents Montgomery and Wernerfeldt, 1988: 623-632).

[13] About the term rent and its generation cf. Subchapter 2.2.

Peteraf (1993: 179-191) discusses four conditions that must be met to achieve a sustainable CA, which are superior resources (heterogeneity within an industry), ex-post limits to competition, imperfect resource mobility, and ex-ante limits to competition, and defines imperfectly mobile resources as those which are specialized to the firm. Peteraf (1993: 179-191) states that such resources "can be a source of competitive advantage", and that "any Ricardian or monopoly rents generated by the asset will not be offset entirely by accounting for the asset's opportunity cost". Barney (2002: 9) argues that "(…) a firm experiences competitive advantages when its actions in an industry or market create economic value and when few competing firms are engaging in similar actions." The firms must differentiate and be in competition with each other. Barney (2002: 9) continues that CA is connected with performance and argues that "(…) a firm obtains above-normal performance when it generates greater-than-expected value from the resources it employs" and that "This positive difference between expected value and actual value is known as an economic profit or an economic rent." Barney (1990: 382-393) also states that not all firm resources lead to CAs because they have to meet four conditions: they must be of rareness, value and of inability to be imitated or substituted. Ghemawat and Rivkin (1999: 49) argue that a firm "that earns superior financial returns within its industry (or within its strategic group) over the long run is said to enjoy a competitive advantage over its rivals." Barney (1991: 102) defines an sustainable CA by the following: "A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy (italics in original)". Hoffman (2000: 1) defines sustainable CAs as "(…) the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy". Besanko, Dranove, and Shanley (2000: 389) state that "When a firm earns a higher rate of economic profit than the average rate of economic profit of other firms competing within the same market, the firm has a competitive advantage in that market" and define economic profit as the "difference between the profits obtained by investing resources in a particular activity, and the profits that could have been obtained by investing the same resources in the most lucrative

alternative activity" (Besanko, Dranove, and Shanley, 1999: 627). According to Kay (1993: 14; 194) CAs can be created if distinctive capabilities are applied in an industry or brought to the market. Kay measures the value of CAs as added value, with the costs of physical assets measured as cost of capital applied to replacement costs. Dierickx and Cool (1989: 1059) argue close to Barney (1986b: 1234-1235) that CA is not obtainable from free tradable assets and extend that by stating "if a privileged product market position is achieved or protected by the deployment of scarce assets, it is necessary to account for the opportunity cost of those assets" and "In those cases, market prices are indeed useful to evaluate the opportunity cost of deploying those assets in product markets. However, the deployment of such assets does not entail a sustainable competitive advantage, precisely because they are freely tradable." Brandenburger and Stuart (1996: 5-24) continue the discussion with the conditions applicable to multi-agent games, where the agents include buyers, suppliers, and producers and the gains to trade are at maximum available from the assignments among the agents. Brandenburger and Stuart (1996: 5-24) conclude that the maximum value is limited by the agents' value added to the game and "To have a positive added value it must be different from competitors" and "enjoy a favorable asymmetry".

The different perspectives demonstrate that the term and generation of CAs is connected with uncertainties regarding: a) "value is to conceptualize or measure (gains to trade, value to owners, increases in value to owners)" (Rumelt, 2003: 2), b) "about the meaning of rents" (Rumelt, 2003: 2), c) "about the appropriate use of the opportunity cost concept" (Rumelt, 2003: 2), and d) "about whether competitive advantage means winning the game or having enough distinctive resources to maintain a position in the game" (Rumelt, 2003: 3). Prahalad und Hamel (1990: 79-91) argue that firms can combine their skills and resources to core competencies in a manner that it can generate an advantage compared to their competitors. The focus on core competencies has a positive impact on the generation of rents and related CAs (Montgomery and Wernerfeldt, 1988: 625). Morgan and Hunt (1996; 1999: 282-283) emphasize the uniqueness of the achieved competencies or skills that are perceived and evaluated as such in the market. Thus, the literature has focused on the interpretation of expressions that can lead to CAs in connection with certain conditions or circumstances and under specific frame conditions.

The different approaches to the generation, perception, determination and interpretation of competitive advantages are significantly affected by certain fundamental views. In the literature, the formative considerations are mainly those that deal with the approaches MBV[14] and RBV[15]. The presentation of the research contributions in Subchapter 2.1 as well as the contributions in the following table (Table 2) demonstrate that the development related to the generation of CAs involves additional resources beyond the consideration of core competencies or dynamic capabilities[16]. The RBV has therefore been expanded to include a relational perspective (RV)[17] that has inter-organizational relations as a resource base.[18] This is due to the fact that traditional resources of firms may be very similar within an industry. To differ from other similarly cost-wise positioned competitors, firms are forced to take relational resources into consideration and by that to establish advantages that can generate cost advantages or rents again. By utilizing this expanded resource consideration that is "most usefully categorized as financial, physical, legal, human, organizational, informational, and relational" (Hunt and Morgan, 1995: 6-7) employees combine their skills and resources in the most efficient, unique and enduring way. Day and Wensley (1988: 2) understand these skills as “distinctive capabilities of personnel that set them apart from the personnel of competing firms”. The resulting RV, which can be understood as an extension of the RBV, is concerned with the generation of CAs and securing them on a long term base on a relational level. Furthermore, it relates to the creation and exchange of knowledge among the actors, and includes relations among firms to combine achievements and key

[14] Cf. chapter 3.

[15] Cf. chapter 4.

[16] Cf. Zimmer and Ortmann (2001: 27-55) for more detailed information about the market relations between MBV and RBV, core competencies and dynamic capabilities.

[17] Cf. chapter 5.

[18] Cf. Lavie (2006), Dyer and Singh (1998), Sydow, Windeler, and Wirth (2003).

factors such as innovation[19], networks[20], commitment[21], and trust[22]. According to Srivastava, Shervani, and Fahey (1998: 2-18) intangible[23] resources can, due to their outward-focus, better contribute to achieve CAs than tangible resources. The authors identify two forms: relational and intellectual resources. They reflect relational market-based assets[24], i.e. the binding between customer and supplier which can be e.g. represented in intimate business relationships. This enables the supplier to manufacture a highly customized product in cooperation with the

[19] Fichter (2014: 13) defines innovation as follows: „Innovation ist die Entwicklung und Durchsetzung einer technischen, organisationalen, geschäftsbezogenen, institutionellen oder sozialen Problemlösung, die als grundlegend neu wahrgenommen, von relevanten Anwendern akzeptiert und von Innovatoren in der Erwartung eines Erfolges betrieben wird.“ (Translation from GER according to Fichter (2014: 13): “Innovation is the development and implementation of a technical, organizational, business-related, institutional or social problem solution that is perceived as fundamentally new, accepted by relevant users and is operated by innovators in the expectation of success”.)

[20] The term network identity according to Anderson, Häkansson, and Johanson (1994: 4) is the perceived attractiveness / non-attractiveness of a firm as an exchange partner due to its unique set of connected relations with other firms, the links to their activities, and the ties with their resources.

[21] Slater and Narver (1995: 63-74) understand the term commitment as the development of new knowledge or insights that have the potential to influence behavior.

[22] Morgan and Hunt (1994: 20-35) define trust as a willingness to rely on an exchange partner in whom one has confidence; Ploetner (1995) adds that person will not expect another person or group of persons to behave opportunistically toward him.

[23] Hall (1993: 609) sepatates resources into tangible and intangible and understands intangible assets as intellectual property rights (non-material like e.g. patents or copy rights, etc.) and tangible (material like e.g. machines, tools, etc.).

[24] I.e.: The detailed and specific knowledge that the supplier collected about the customer (e.g. needs, habits, decision-making processes, decision-makers, preferences, etc.).

customer.[25] Customer and supplier establish a relationship on a contractual or non-contractual basis that rests on common interests and share a common goal, namely to create an achievement that is customized for the customer and thus quasi unique (e.g. CI[26]). In addition to the characteristics of being rare, unique, valuable, and difficult to imitate or substitute, these intangible resources and skills can be combined in a unique way. Firms aim to achieve sustainable CA by inter-organizational learning. Table 2 presents the shift of focus toward intangible resources.

Therefore, organizational learning[27], innovation, relationships, and networks take on a new and important role in the contemplation and in conjunction with CAs. Relationship marketing and the creation of networks are of particular importance in achieving CAs. According to Morgan and Hunt (1996; 1999: 281-290), resources such as loyalty, trust and reputation are immobile resources which cannot be purchased or built in the short term.

[25] Cf. in detail chapter 7.

[26] Cf. in detail chapter 7.

[27] According to Slater and Narver (1995), organizational learning is to be understood as the development of new knowledge or insights that have potential to influence behavior.

TABLE 2: Relationship of sustainable CA to concepts in strategy theory

Strategic conception	Author (date)	Relationship / contribution to Competitive Advantage
Branding	Gardner and Levy (1955), Aaker (1991), Keller (1993)	They define branding as what distinguishes a product from competitors; brand equity is described as a potential source of CA.
Market orientation	Kohli and Jaworski (1990), Jaworski and Kohli (1993; 1996), Day (1994a), Slater and Narver (1995), Hunt and Morgan (1995), Morgan and Hunt (1996)	They argue that market orientation is an intangible resource which involves a dual focus on customers and competitors. Market orientation can contribute to achieve sustainable CA.
Organizational learning	Fiol and Lyles (1985), deGeus (1988), Ghoshal and Westney (1991), Glazer (1991), Day (1994b), Slater and Narver (1995)	Managing information is an asset used to gain sustainable competitive advantage that lies in the ability to learn faster than competitors.
Innovation	Foxall (1984), Wolfe (1994), Rogers (1995), Gatignon and Xuereb (1997)	Competitive advantage can result from those innovations which are consistent with the firm (socially and technologically) and provide some direct or indirect value to customers.
Customer value	Day and Fahey (1988), Woodruff (1997), Parasuraman (1997), Slater (1997)	The provision of customer value is a source for competitive advantage. If customers' desired values change, firms should monitor these changes via continuous learning about customers.[28]
Relationship marketing	Morgan and Hunt (1994; 1996, 1999)	The building of trust and commitment make relationship marketing rare and difficult to imitate, thus rendering it a potential source for SCA.
Networks	Thorelli (1986), Jarillo (1988), Iacobucci and Hopkins (1992), Anderson, Häkansson, and Johanson (1994), Achrol (1997, Gulati (1998)	Networks involve technology transfer and informational exchange; trust fosters network relationships; networks allow for core competencies to be strengthened and resulting in CA; network relationships should be a part of strategic planning.

Source: adapted from: Hoffman (2000: 9); modified

[28] This is also related to the concepts of organizational learning and relationship marketing.

It is probably difficult for competitors to imitate appropriate long term relationships based on trust and loyalty to partners and customers as a resource. Therefore, Morgan and Hunt (1996) argue that relationships that are based on organizational, relational or informational resources in conjunction lead to sustainable resource-based CAs. Webster (1992) argues that the formation of networks provides the opportunity to build relationships with business partners, to deepen them and to exchange information just-in-time. They reduce administrative and market control resources and enhance those resources like trust that are important for building long-lasting relationships. Anderson, Häkansson, and Johanson (1994: 5) argue that networks are the "step beyond" dyadic relationships or partnerships and consist of various multiple relationships which allow each participating firm to gain the resources they need to build core competencies and achieve sustainable CAs. Jarillo (1988) states that establishment of trust and goal congruence are the two critical factors in the development of organizational networks and determine effectiveness and efficiency in the network relationship. The presence of the intangible asset of trust in a relationship is therefore an indicator of value that does not allow opportunistic behavior, because if parties participating in the network realize the opportunities to create joint value the network can enable and support each participating firm to specialize in activities it performs best (Jarillo, 1988). Thus, the inclusion of aspects of the RV, especially in competitive situations where a distinction between competitors in terms of tangible assets seems to be difficult or impossible, can provide firms with the option to achieve CA and relational economic rents by the inclusion of inter-organizational relations, and to use them in order to set themselves apart from the competition.

2.2 COMPETITIVE ADVANTAGE BY ECONOMIC RENTS

In order to be in the position to generate a CA in an industry, firms must be able to generate economic rents which have a certain stability (sustainability), so that both the economic rents and the resulting CA are useful for the firm (Schindler, 2015: 162). Firms generate an economic rent, if the return that is based on the use of the resources exceeds the expenditure needed to control the resources (Zimmer 1999: 109-110). Depending on the kind of resources, the literature distinguishes between Ricardian rents, Monopoly rents, Entrepreneurial

rents and Pareto rents (quasi rents) which will be briefly characterized in the following (Mahoney and Pandian (1992: 364; Peteraf, 1993).

Ricardian rents are derived from permanently or almost permanently existing property rights on in principle transferable resources, such as raw materials, patents, etc. (Mahoney and Pandian, 1992: 364). According to Lippman and Rumelt (1982: 419) a firm can achieve rents if it is the owner of factors which are in principle uncertain[29] to imitate (e.g. rights to a brand name, reputation, etc.). Montgomery and Wernerfeldt (1988: 623) state "that Ricardian rents may be appropriated by owners of inimitable factors or by their trading partners if relation-specific investments tie the partners together". "Ricardian rents occur when superior resources[30] lead to lower average cost with inelastic supply curves" (Schindler, 2015: 162). Increasing market prices lead to an increase of the market´s attractiveness and to a reduction of the entry barrier level to the market, so that non-competitive or higher-cost firms get a chance to enter the competition with already established firms.[31] The new entries are high-cost firms achieving break-even, where the price is equal to average cost, when at the same time low-cost firms with their superior resources earn supernormal rents, when the price is higher than the average costs. The supply of these superior resources is limited; hence competitors cannot expand or imitate them in the short run. This means superior resources are quasi-fixed and the source of the advantages and can only be renewed incrementally in the long run (e.g. knowledge-based resources and collective learning) (Prahalad and Hamel, 1990: 79-91; Schindler, 2015: 162).

According to Rumelt (1987) monopoly rents are generated by high entry barriers or from competitive restriction due to governmental limitations and/or property rights to resources that are scarce (e.g. concessions, import taxes, etc.);

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[29] With reference to Lippman and Rumelt (1982: 418-438), Montgomery and Wernerfeldt (1988: 624) argue that the uncertainty is related to the fact that a competitor could try to develop a similar (in the sense of comparable) reputation, which makes an investment in principle uncertain and the factor imitable.

[30] Cf. Subchapter 2.1 (Fig. 2) that represents superior skills and superior resources as sources of CA.

[31] Cf. Prahalad and Hamel (1990), Peteraf (1993), Zimmer (1999) and Schindler (2015: 162).

they are quasi-rents in the form of lags and information asymmetries which means "a deliberate restriction of output rather than an inherent scarcity of resource supply" (Peteraf, 1993: 182).[32]

Entrepreneurial rents occur through Schumpeter shocks, resulting from the willingness to take risks or entrepreneurial foresight in uncertain environments (Schumpeter, 1964; Wieandt, 1994: 1029; Peteraf, 1993: 184, Schindler, 2015: 163).

Klein, Crawford, and Alchian (1978: 297-326) state that Pareto rents stem from the difference between the value of the resource to a firm and its opportunity cost and "the excess of an asset´s value over its salvage value or its value in its next best use" (Peteraf, 1993: 184) or firm-specific resources and capabilities (Bamberger and Wrona, 1996: 134; Mahoney, 1995: 91).[33]

The existence of an economic rent is subject to market failure in the neoclassical sense, because in markets with completely mobile resources and total transparency, rents cannot occur (Zimmer, 1999: 110; Montgomery and Wernerfeldt, 1988: 623). If all firms on a market would have homogeneous resources and internal capabilities, then in theory all the firms participating in the market would have the potential to imitate successful strategies of their competitors by employing the same resources and capabilities. If one of the firms would generate a CA it would be of short duration, because all other firms on the market would inevitably immediately imitate it due to the given market transparency. That would lead to a situation where the corresponding firm has no possibility to protect this advantage over its competitors (Barney, 1991: 104; Zimmer, 1999: 110). Zimmer (1999: 110) follows Barney (1991: 104) and argues, that at least the expectations of the market participants about the achieved profit from the use of the resources and capabilities must be heterogeneous and a differentiation exists in application and use (e.g. in the meaning of efficiency) which can only occur under conditions of market intransparency (Schindler, 2015: 163). Under such conditions the ways for firms to achieve superior profits must be different. Therefore, it is necessary that as an input condition at least heterogeneity exists. That means that the firms are equipped with different resources and capabilities (Rasche, 1994: 55; Peteraf, 1993: 180; zu Knyphausen,

[32] Cf. Schindler (2015: 163).

[33] Cf. Schindler (2015: 163).

1993: 774, Schindler, 2015: 163). Figure 3 presents the four conditions that, according to Peteraf (1993: 185) must be met, so that firms are able to generate rents and CAs.

One of the conditions is heterogeneity. Heterogeneity is the result of inefficient factor markets[34] (Rasche, 1994: 55; Montgomery and Wernerfeldt, 1988: 623; Zimmer, 1999: 110). Barney (1991) argues that resources and capabilities necessary for production are heterogeneous and differ in their efficiency level across firms. This implies that firms compete in a market with their varying capabilities and achieve at least break-even. Under the precondition that industry demand and supply determine the minimum efficiency level which is necessary to achieve break-even, firms with only marginal resources can expect to achieve only break-even. Compared to that firms with superior resources will earn rents which Peteraf (1993: 180) defines as "earnings in excess of break-even".

Ex-post limits to competition represent a second condition. As a basis the precondition of heterogeneity in order to achieve rents has to be fulfilled. If competitors in a market increase the supply of scarce resources, and firms with monopolistic / oligopolistic behavior decrease their output monopoly, rents will be limited by imperfect imitability and imperfect substitutability (Barney, 1991; Dierickx and Cool, 1989; Peteraf, 1993). Such limitations to preserving the rents of a firm are e.g. property rights, quasi-rights (e.g. lags, information asymmetries, frictions, etc.) or producer learning, buyer search and switching costs, reputation, channel crowding, and economies of scale (Rumelt, 1987:137-158). These are mobility barriers and serve to isolate groups of firms which are similar to each other in a heterogeneous industry.[35] According to Ghemawat (1986: 56) inimitable

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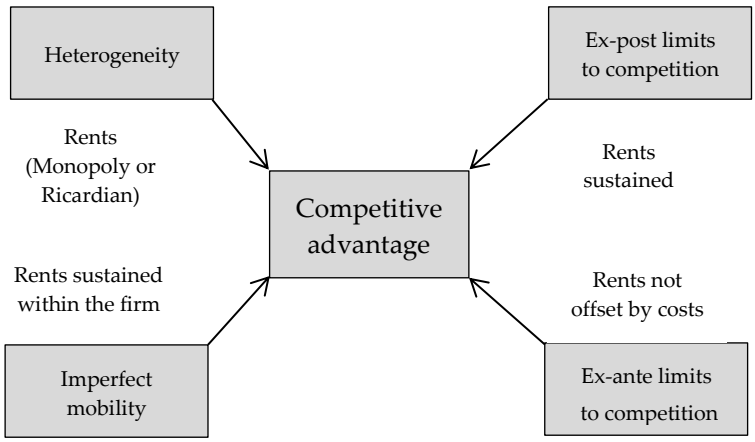
[34] A factor market can be understood as the place where demand and supply about the resource input factors meet (Barney, 1986: 1232). Barney also states that suppliers who need to acquire strategic success potential on factor markets need to connect strategic decisions about sales markets to strategic decisions in the corresponding factor markets.

[35] In comparison: Entry barriers (Porter, 1980) isolate participants of an industry from potential entrants. Yao (1988:59-70) extended the list of entry barriers for failures made by the competitive market due to production economies, sunk costs, transaction costs, and imperfect information.

positions among firms derive from size advantages, preferred access to resources or customers, and / or restrictions on the options competitors have. Such restrictions are given if resources and capabilities are concerned which are not tradable assets, are accumulated and developed within the firm, have a strong tacit dimension, are socially complex, and born of organizational skills and corporate learning (Dierickx and Cool, 1989). Also factors like the level of learning, investment, asset stocks, and development activities are immobile and bound to the firm. If a firm can use resources on an exclusive and sustainable basis, these resources become strategically valuable for the firm and enable the firm to earn rents (Rumelt, 1984). Firms see the sustainable access to these strategically valuable resources, ensuring the ability to earn rents, as a mechanism of isolation in order to save their competitive position (Mahoney and Pandian, 1992: 371; Rumelt, 1984). This means that imperfect mobility is a key factor for the generation of sustainable rents and CA.

FIGURE 3: The cornerstones of competitive advantage



Source: adapted from Peteraf (1993: 186); modified

The third condition is imperfect mobility. This applies to resources if they are specialized to firm-specific needs (Williamson, 1985). This could be e.g. a machine that is developed only for a special purpose and which is so special that it has no usage value for another firm. Resources where the transfer related costs (transaction cost) are exceedingly high are also imperfectly mobile due to being non-tradable or less valuable to other firms. Such resources remain with the firm, can be used over a long time, and are a possible source for sustainable CAs due to their exclusive use. Due to their uniqueness the value to use the resource is higher to the firm than their opportunity costs, which makes these resources strategically valuable. The resulting difference is an economic rent. Imperfect mobility is characterized by imperfect mobile resources and rents shared among firms (Wernerfeldt, 1989), because special resources cannot be productive apart of a firm and are related to both, the firm and the resource[36], which makes imperfect mobility "to a necessary condition of sustainable competitive advantage" (Peteraf, 1993: 184).

Ex-ante limit to competition is mentioned as the fourth condition. It means that prior to the possibility of other firms and under the precondition of limited or absent competition a firm establishes a superior resource position by anticipating future demands. This is ideal to develop imperfectly mobile resources (e.g. sympathy of the customer or good will). In the absence of competition or with only limited competition, the costs for the implementation of a strategy, access to resources and its execution must be lower than in a competitive situation. Barney (1986:1231-1241) argues that economic performance does not only depend on

[36] Rumelt (1987: 143) states: "The rent on (specialized) factor(s) is not logically or operationally separable from the profits of the firm."

returns from a firm´s strategy; it also depends on the cost of the implementation of such strategies.

Peteraf (1993: 185) states "Resource heterogeneity creates Ricardian rents or monopoly rents. Ex-post limits to competition prevent the rents from being competed away. Imperfect factor mobility ensures that the valuable factors remain with the firm and that the rents are shared. Ex-ante limits to competition keep costs from offsetting the rents" so that all four conditions must be met in order to enable a firm to achieve above-normal returns and CA.

2.3 CONTROL MECHANISMS TO MEASURE COMPETITIVE ADVANTAGE

The ability to achieve CAs in the form of economic rents has an impact on the competiveness of firms. According to Boon (1998: 22-24) market share and profitability are the most applied indicators for the competitiveness of firms. As an alternative Day and Wensley (1988) support the measurement of customer satisfaction, because it reflects the competitive position of firms from a customer perspective and is a statement about market share and the temporal and causal profitability. Hausknecht (1990: 2-4) argues that customers choose the one achievement of a supplier in the relevant company-specific situation that provides the greatest benefit, and this individual comparison of expected and perceived achievement can be used to measure customer satisfaction. Day and Wensley (1988: 9) have subdivided methods and techniques for assessing the competitiveness of firms according to different study areas with the focus on competition or customers. This results in the picture presented in Table 3.

TABLE 3: Methods for the analysis of competitiveness

Analysis topic	Competition focus	Customer focus
Sources of competitiveness	Management-based analysis of strength and weaknesses; comparison of use of resources and skills; marketing management audit	
Efficiency of the use of resources	Benchmarking	Promoter analysis
Competitive advantages	Comparisons of costs and competitor activity	Comparative evaluation of the performance of choice models, conjoint-analysis, competitive configurations
Identification of success factors	Winner-loser-comparison; investigation of the causes of high returns; benchmarking	
Measures of success	Market share; profitability (return on sales, return on capital employed)	Survey of customer satisfaction, customer loyalty, market share relative to recent buyers

Source: adapted from Day and Wensley (1988: 9); modified

The diversity of methods indicates that there is no valid scale *per se* to measure CA of firms.[37] Empirical studies focus on the measurement of the value of CA as added value, with the costs of physical assets measured as cost of capital applied to the replacement costs (Kay, 1993: 14; 194). Montgomery and Wernerfeldt (1988: 627) tested Tobin's q as a measure of economic rents and

[37] Cf. Subchapter 11.2 with the recommendation for further research.

define it "as the ratio of market value to the replacement cost of the firm".[38] In detail they express q as the following term:

$$q = M / V_P = 1 + (V_I + V_C + V_R + V_E) / V_P$$

The ratio of the market value of the firm (M) and the replacement value of physical assets (V_P) can be expressed as the ratio of the sum of 1, the value of intangible assets purchased by the firm (V_I), the value of collusive relationships with competitors (V_C), capitalized Ricardian rents (V_R), disequilibrium effects (V_E), and the replacement value of physical assets (V_P). One of the conclusions of the test is the result that the more a firm diversifies the less the firm can focus on core competences and the lower are achievable average rents.

A weakness of the study is that it refers “only to large, successful firms” and that “the theory is not expected to extend to small competitive firms” (Montgomery and Wernerfeldt, 1988: 631). The majority of the German suppliers of systems and components for baggage handling applications are small and mid-sized enterprises (SME).[39]

Each of the above methods provides its own meaningfulness and can therefore represent only a part within an overall analysis. For example, an internal SWOT analysis does not provide a conclusion on how the company is perceived from the perspective of the customer compared to its competitors. To be able to make statements in the context of such an analysis the customer has to have a certain transparency regarding the internal strengths and weaknesses of the related firm, or at least the opportunity to acquire this knowledge.[40] Therefore, a statement on the competitiveness of a company can only be made by a combination of several methods and taking the competitive and customer

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[38] The empirical test (N=167) by Montgomery and Wernerfeldt (1988: 627-632) was focused on the test of the correlation of diversification and achievable average rents under conditions of higher and lower factor specificity.

[39] Cf. chapter 10.

[40] Cf. chapter 7. Through the involvement of the customer, customer Integration provides bilateral insight into the processes and structure of the integration partner and can thus provide supporting resources related to the achievement potential of the partner and its degree of integration.

position into account. Once this has occurred the focus lies on the control and sustainable retention of the CA so that it enables the firm a CA position over a longer period. According to Orth (1998) a firm may, for instance, collect information about the behavior of the customers in certain segments by means of a situation analysis. This could help to measure the firm's success, and to detect its CAs by similarity and preference judgments according to selected achievement characteristics. Based on a causal analysis, information can be collected and analyzed in a second step which is related to the customer, competition and sources. Thereby, customers' attitudes and motives are investigated. With a view on the competition the results can be analyzed with respect to the used or preferred instruments of the marketing mix. Based on the characteristics of achievements that have to be provided, it is crucial to analyze their respective relevance. With regard to the source it is relevant to analyze the efficiency of the use of resources. From the information and knowledge gained, strategic (e.g. planning and development of CAs; imitation vs. innovation, etc.) and tactical (e.g. efficiency increase by improving the use of resources) specification measures can be derived (e.g. evaluation of the executed measures; learning about the market reaction) and put in place.

Focusing on the application of competition-related methods in order to analyze, plan and control the specific position of a firm can lead to losing attention to the concerns / benefit expectations of the customers and the market structure (Rothschild, 1984; Faix and Goergen, 1994). The simultaneous assumption of effective marketing places firms in danger of imitating their competition in terms of strategies, without developing alternative and more innovative strategies themselves, although these could create a favorable competitive position or achieve a CA. Customer-oriented methods compare competitors in a market from the customer perspective without taking a corporate internal perspective. They neither focus on costs nor on measures for creating an achievement, but rather on the identification of advantageous competitive positions and the analysis of measures to success[41], such as customer satisfaction, customer loyalty and the relative proportion of recent buyers. Customer

[41] Techniques to apply are choice models, like e.g. conjoint-analysis or graphic configuration of competitive positions.

satisfaction is one of the most important strategic business objectives, which is often attempted to detect and evaluate by means of a customer barometer in customer surveys. A customer barometer can provide a current view of the customer in terms of purchased products (primary achievement characteristics) and then often serve as a customer-oriented overall satisfaction indicator and indication of re-purchase intentions, in which secondary achievement characteristics are often not considered (Orth, 1998).

TABLE 4: Competition-advantage matrix

		Achievement value from customer perspective compared to competition		
	Input	**inferior**	**equivalent**	**superior**
Costs compared to competition	lower	undefined position	cost advantage	achievement and cost advantage
	equivalent	achievement disadvantage	equilibrium position	achievement advantage
	higher	achievement and cost disadvantage	cost disadvantage	undefined position

Source: adapted from Morgan and Hunt (1996: 109); modified

Customer loyalty expresses the sincerity and quality of the relationship between supplier and customer and is argued by Porter (1976: 398-406) as a positive difference between the cost of the search for a satisfying offer and its benefits. However, this description is not an indication to how to develop the perception of the customer, which in turn could be used as an approach to

additional corporate measures. For example, the means of CI in the development and implementation of an achievement could be such an approach, as a very strong identification with the achievement develops over the strong involvement of the customer, as well as closeness with the supplier due to the close cooperation.[42]

The relative proportion of recent buyers as an indicator of competitiveness (Hedley, 1977) cannot be as meaningful as an absolute market share. In contrast to that Hedley (1977: 9-15) argues that the relative market share, which means the share of the own company compared to the cumulative market shares of the three largest competitors, can be more meaningful to assess competitiveness.

Comparing the cost of using resources and capabilities to the value which a customer attributes to an achievement results in a competition-advantage matrix, which represents the respective competitive position of an achievement when compared to the competition (Hunt and Morgan, 1996). Accordingly, the undefined position represents a position at which the higher value of an achievement will be not perceived by the customer due to the cost level of resource use. Furthermore, a cost advantage from the perspective of the customer cannot be presented or be effective due to the low value (e.g. the achievement is absent due to parity). In the case of performance and cost disadvantages in the case of cost parity (also at higher cost) there are achievement disadvantages due to a lower rating from the customer's perspective. Under the precondition of achievement parity and depending on the cost situation, cost advantage, cost disadvantage, and equilibrium are all possible positions. This can lead to the effect that at a cost advantage in a customer dominated market can be used to generate superior profits. This may also affect other companies in a seller's market. These superior profits can be used as a basis for the creation of future achievement advantages.

In the position of an achievement advantage, at the same cost level and due to the value of the desired achievement perceived as superior by the customer, an achievement advantage can be generated. An achievement advantage is also given with a lower cost level, which can lead to superior profits.

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[42] Cf. in detail Subchapter 3.2. It constitutes an entry barrier against competitors and an exit barrier against the customer.

2.4 COMPETITIVE ADVANTAGE AS A BASIS FOR THE SUCCESS OF A FIRM

To determine what achievement advantages a company has and how these advantages can be established two approaches are possible. Hence, on one hand the consideration can be customer-oriented; on the other hand it can be competitive-oriented. The competitive-oriented procedure is an inside-out perspective that focuses on selected competitors where it is assumed that they are appropriately positioned in direct comparison with the own firm. The question is how good the own resources and offers are positioned in comparison to competitors. Seeing the supplier from the customer's perspective by means of the customer-oriented view (outside-in) and an extensive analysis of customer value, appropriate measures for the supplier to improve the achievement can be derived from the gained knowledge. Boon (1998: 22-24) argues that in principle both perspectives[43], inside-out as well as outside-in, should be in a balanced ratio in the analysis of CAs. This balance is to prevent a possible one-sidedness in gaining knowledge. After receiving the necessary information about the achievement position of the supplier compared to the competition, further action deals with generating a CA from it, which then in turn leads to success for the firm. Porter (1985) mentions individual capabilities and firm-specific resources as possible causes of CAs for firms if, on the one hand, they lead the firm to reduce costs and on the other hand to create value for customers.[44] According to Hunt and Morgan (1995: 1-14) a firm achieves CA compared to its competitors if the firm is able to use its available heterogeneous resources better than the competitors. In this context, the efficiency of the use of the heterogeneous resources is crucial (Day and Wensley, 1988: 18).

Bamberger (1989: 80-88) characterizes this superiority in that he argues that the value perceived by the customer, which is expressed by the price that the customer is willing to pay, is higher than the necessary costs for establishing a CA. The crucial factor here is the way in which the achievement is perceived and evaluated by the customer (Faix and Goergen, 1994: 164). Intangible resources,

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[43] For more detail see chapters 3, 4 and 5.

[44] Cf. Subchapter 2.1.

such as communication, trust, and knowledge, etc. may represent a significant entry barrier to the competitor.

2.5 RELATION TO THE TOPIC

Heterogeneity, ex-ante limits to competition, ex-post limits to competition, and perfect immobility are according to Peteraf (1993: 185) the conditions that must be met for the generation of economic rents. She argues that "Heterogeneity is the most basic condition" (Peteraf, 1993: 185) to achieve sustainable CA. The following refers to these conditions and provides the connection to the topic of this thesis.

Subchapter 8.6 presents significant legal framework conditions of tendering procedures for public procurement which are also applied in the airport-related baggage handling Industry. It is clear that the customer side is interested in having homogeneity in terms of achievements (e.g. product, system) of suppliers within the industry by applying the tendering regulations.[45] Under these circumstances, the achievements of suppliers are comparable or even identical.[46] With a concentration of technically identical or comparable achievements[47] it is not practical or almost impossible for the supplier to stand out from the competition in an appropriate manner. Homogenization of the achievement is the result, which is probably positive for the customer from the perspective of the costs,[48] but also represses the additional technical CAs of a supplier so that they cannot enter the game. Due to the legal framework conditions the supplier is forced to focus on such resources that are different from tangibles. Such resources should be difficult to imitate and nearly immobile. The supplier is therefore interested in providing recognizable added value to the customer by other means, which can distinguish the supplier from the technically comparable competitors in order to achieve CAs or economic rents. These other resources can be relational

[45] See in detail Subchapter 8.6.6.

[46] Achievements will be comparable by the formulation and application of product names or their equivalents in the tender documents.

[47] Cf. Subchapter 8.6.6 and §7 (7) SektVO.

[48] Transaction costs related to the evaluation and comparison of offers, etc.

(e.g. customer goodwill, trust, commitment, knowledge, etc.) and can due to its immobility set the supplier apart from the competitors in a sustainable way (Dyer and Singh, 1998: 673). The customer can also be directly and actively involved in the development and planning of an achievement involving the implementation of the customer´s requirements, bringing his experience and knowledge from his core competence in baggage handling on board. This will determine the performance of the customer in his core business at a later stage. These solutions can be provided as part of a tender and are available for all potential suppliers, which results in homogeneity among the potential competitors. The integration of the customer in advance of creating the achievement establishes a relationship with the customer on a relational level. Consequently, this can lead to the objectivity of the customer being affected by subjective assessments during the public procurement procedure and to an advantage for the firm that is involved as an integration partner. Supplier and customer have an information advantage that the potential competitors probably not have. This creates heterogeneity among the potential suppliers. Customer and supplier enter into a symbiotic relationship due to a reduction of the risk to fail with the project, which is an advantage for both of the integration partners. On one hand the airport is assured that the supplier is really able to understand the requirements and the task ahead to solve the problem successfully, on the other hand the supplier is able to reduce a project risk that could be caused by lack of information or a failed description. Airport and supplier reduce the tender risk, win safety and increase the probability of project success by means of intangible assets. The lower risk evaluation can influence the cost calculation of the supplier, and under normal objective criteria this can lead to a more competitive and more promising offer for the customer which results in a CA for the supplier. On this basis a sustainable relationship with the customer can emerge that is built on relational value in line with the potential for the supplier to generate cost advantages or economic rents on a sustainable basis. If the relationship based on relational assets is comparable when related to the technical achievements assessed as superior or as added value by the customer, then the supplier and integration partner have achieved a sustainable CA by means of a relational rent.

3 MARKET-BASED VIEW

3.1 CLASSIFICATION IN STRATEGIC MANAGEMENT

The previous chapter dealt in detail with the generation of CA. It presented that market failure leads to the development of economic rents due to above-normal firm performance and the emergence of supernormal profits. Economic rents can arise both on the sales market and on the market for resources. Firms have the possibility to determine the mobility barriers in both markets, in order to achieve success by CAs in order to generate rents. Firms need to find the right strategy in order to be successful. The term 'strategy' can be traced back to the combination of the Greek words "stratos" (army) and "agos" (leader). Henderson (1993c: 20-51) states that the concept of strategic leadership has always been applied in battles and is found in many writings of military leaders. Thus, Giles (1961: 12) for example cites the Chinese military leader Sun Tsu[49] who states:

> "Hence the saying: If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle." (Giles, 1961: 12 according to Sun Tzu, 544-496 BC)

A strategy that uses the knowledge about the own and the enemies' strength and weaknesses in order to achieve an advantageous position or a strategic CA, which in the end can be crucial for victory or defeat, has already been described. Over time, the term and the conceptual application have been extended from the military context to other fields. With regard to economic issues, conceptual expansion, for example in the field of corporate governance and strategic management, took place already in the 1940s by Harvard Business School and was defined as a comprehensive approach to strategic planning and strategic management in the 1960s (Staehle, 1999: 603). However, Giles (1961: 12)

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[49] Sun Tzu was a Chinese army leader and military strategist who lived approximately from 544-496 BC in the province of Wu or Qi / China.

cites Sun Tzu (544-496 BC) who argues that strategy is the hidden weapon, and tactics are visible to everyone. Staehle (1999: 601) states that e.g. von Clausewitz constructed analysis and planning instruments with the goal to develop strategies based on scientific knowledge. Hinterhuber (1990: 12; 81) argues that other generals included the random factor in their considerations and strategies in order to integrate as many variants as possible, instead of understanding the concept of strategy as a comprehensive planning and analysis tool and thus to include the execution as a part of the strategy by a kind of incremental approach (Hinterhuber, 1996: 12). Staehle (1999: 601-603) argues about the necessity for abstraction so that firms that are in permanent competition with each other have more options to act and a higher strategic flexibility. Staehle (1999: 603) characterizes strategy as a concept in which the actors have access to certain resources and are interested in opportunities in order to develop and implement alternatives. Mintzberg (1987: 16) characterizes strategy as taking into account the actions of others, being proactive, sustainable, and neither visible nor touchable. With the ongoing integration of the strategic concept in the theory of corporate governance, the focus of the coordination of individual functional management tasks moved on to the coordination of investments, markets, products and competition (Ansoff, 1965: 50-60). As a basis for the development of strategic alternatives, and thus for a decision about markets and products, an analysis of resources, strengths, weaknesses and the environment should be used that allows the preparation of long term and detailed planning within the context of the strategic planning. From this the term strategic management emerged, which is focused on defining, controlling and securing of the long term corporate development that also takes internal factors into account (Macharzina, 1999: 490-500). In order to be prepared for the increasing environmental changes a flexible and adaptive organization of the firm is necessary (Ansoff, 1965: 54-59). The increasing importance of the inclusion of the environment of the firm, based on its changing dynamics, supported the development and importance of strategy concepts in corporate governance (Macharzina, 1999: 203). The development of appropriate analytical tools and the differentiation of firms contributed to the increasing importance of appropriate strategic concepts for corporate governance (Rumelt, Schendel, and Teece, 1991: 5-29). Table 5 presents the hierarchical formulation of appropriate strategies and their focus on strategic business fields.

It is a core task of corporate governance to secure the firm´s competitiveness and to generate a "return on capital" (Sloan, 1963: 69) and above normal profits or economic rents. The basis for achieving these goals as a part of the strategic management is the theory of industrial organization, which revolves around the reasons for the economic success of firms in order to derive appropriate recommendations to act.

TABLE 5: Strategy formulation hierarchy

Hierarchy level	Focus on	Content on	Applicable approach
Industry policy	Total industry	Frame conditions of a specific industry (e.g. airport, logistics, etc.)	Market-based view (MBV)
Corporate strategy	Total enterprise	Definition of products, services, markets.	Resource-based view (RBV), Relational view (RV)
Business strategy	Business unit	Demarcation and orientation of strategic entities	Resource-based view (RBV), Relational view (RV)
Functional strategy	Functional entity / department	Goals and measures related to the added value chain	Resource-based view (RBV), Relational view (RV)

Source: adapted from Hofer and Schendel (1978: 14); modified

Fundamental research contributions made by Mason (1949), Chamberlin (1933; 1949; 1950; 1956), Bain (1954; 1956; 1959; 1968), Chandler (1962), Ansoff (1965), and Andrews (1971) on the development of strategic management has tried to answer the question about how firms can achieve success.

They surveyed the related determinants, and how the success of a firm can be influenced, related to two paths: a) strategy process research, which deals with the formulation and implementation of strategies. It assumes that the process of strategic decision-making consists of a systematic series of stages, and b) strategy content research that examines the content of actual strategic decision-making. The determinants of success were spawned by "clinical case studies of actual situations, with generalizations sought through induction" (Rumelt et al., 1991: 8) in the 1960s and 1970s. The integration of exit and mobility barriers as well as the application of the game theory extended Bain's concept with the goal to meet the interdependencies of established suppliers and new entries much better.[50] Up to date several strategic approaches in the form of strategy views have been developed. The approaches are partly shaped by various and contradictory arguments, which can help firms to achieve CA against competitors. The literature distinguishes the strategy views in inside and outside oriented approaches, showing operational factors and functions, which are not observable but influence the value chain of the firm (Stölzle et al., 2007: 5), and which essentially concern the question how to explain differences in firm´s success and how firms can create CAs that is sustainable in order to achieve the highest value possible (Stölzle and Hofmann, 2007: 1; Schindler, 2015: 165).

The literature on strategic management discusses many approaches[51] in order to explain how firms could achieve sustainable CA. Out of these approaches three basic and essential views were selected and considered for the further discussion in this thesis. In the 1980s Michael Porter contributed to the dissemination of the approaches, particularly by applying the market-oriented perspective of the MBV (Mintzberg, Ahlstrand, and Lampel 1998: 82-83; 99-100). Porter applied the welfare theory oriented industrial organization on individual firms and tried to derive what strategic lessons they could learn from an industrial organization; with this view he established the market-based perspective. As an outside oriented approach, the MBV tries to explain

[50] Cf. e.g. the contributions by A. A. Cournot, M. Bertrand, E. H. Chamberlin, J. Robinson and H. Hotelling.

[51] E.g.: Game theory, core competence approach, resource dependency approach, knowledge-based view, etc.

the success of the firm on hand of a view of the total market to which a specific industry belongs. Next to the necessity of explaining how firms generate success within an industry[52] Rumelt et al. (1991: 9) mentions additional reasons that supported the success of the MBV:

First reason: The success of the experience curve concept, which originated in the attempt to explain cost developments in various industries. In their investigations, the Boston Consulting Group in 1966 came to the conclusion that when doubling the production volume the prices of goods fell by approximately 25% (Henderson, 1993a). This means that with a doubling of the accumulated experience, the prices can be understood as an expression of the value added costs, resulting in the core message that with each doubling of cumulative experience the value added costs decrease by 20% to 30% (Henderson, 1993b; Zimmer, 1999: 43). This was explained by learning and specialization effects and economies of scale, etc. (Zimmer, 1999: 43; see in detail Henderson [1993a; 1993b] about the experience curve).

Second reason: The development of economic theories in order to explain permanent income differences of firms, such as the entry and exit barriers (Bain, 1968; Scherer, 1973; Caves and Porter, 1976; Porter, 1981) as a basis for Porter's contributions, named Competitive Strategy (1983) and Competitive Advantages (1986). Explaining the formation of permanent income differences can be provided by the resource-based view[53] which is considered in more detail in the further course of the thesis[54]. Also the commitment approach by Ghemawat (1991) about lock-in and lock-out processes tries to explain the reasons for differences related to the return (Zimmer, 1999: 43).

Third reason: Abandoning the neoclassical model of the firm[55] as "(…) a smoothly running machine in a world without secrets, without frictions or

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[52] Cf. Subchapter 3.5 about critical aspects and further development.

[53] Cf. Wernerfeldt (1984, 1989), Barney (1986, 1991, 1992), Ghemawat (1986), Grant (1991), Hall (1991), zu Knyphausen (1993).

[54] Cf. chapter 4 for more details.

[55] Moss (1981: 10) states that "the neo-classical theory of the firm can be applied only to those abnormal cases in which all competing firms accept production technologies from sources which are external to their industry. Such

uncertainty, and without a temporal dimension" (Rumelt et al., 1991: 13) to a more realistic view of the firm, with main contributions by the transaction cost theory, agency theory, and the game theory (Zimmer, 1999: 43).

Fourth reason: The move toward more economy-based research by research staff at American business schools (Rumelt et al., 1991: 16; Zimmer, 1999: 43).

Additional important concepts base on a firm´s property rights to resources and are opposed to the MBV's inside-oriented approaches, which try to explain the success of firms being subject to internal firm characteristics, and can differ e.g. in the RBV, knowledge-based view, capability and resource dependency concept, and, most recently, the RV. In the further course, this thesis discusses on hand of the MBV, the RBV, and the RV the applicability of the approaches to present answers to the topic under the special market conditions faced by the German baggage handling industry.

3.2 FUNDAMENTALS OF THE MBV

As Hungenberg (2001: 51) states the MBV[56] is one of the most important mile stones in the development of the strategic management. The MBV tries to explain the differences in the success of firms – related to above normal profits, which should not exist according to the neoclassical theory, with differences within the structure of the industry and the precondition of a non-perfect market. Kaufer (1980: 9) states that a classification of the structure should lead to specific behavior of the actors and to a disclosure of the relation of the results of firms. The approach has its roots in the works of Mason (1949) and Bain (1959; 1968) and

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firms cannot attempt the development of new products, of new inputs or of new ways of producing old products with new inputs. If competitive pressures lead them to do any of these things, the conditions of the application of the neoclassical theory of the firm are violated." Moss (1981: 12) continues that "The neo-classical theory of the firm, if the foregoing argument is right, is so special that it represents no important aspect of normal economic activity."

[56] Cf. Schindler (2015: 166-169).

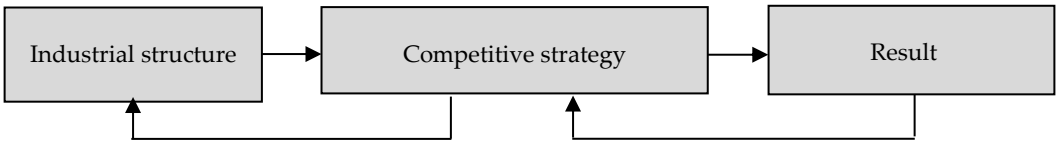
their Structure-Conduct-Performance-Paradigm (SCP-Paradigm)[57]. Structure (S), conduct (C), and performance (P) build on each other so that the market structure determines the strategic commercial behavior upon which the return of the firm (P) is dependent (Bain 1968; Porter 2000: 4; Schindler, 2015: 166). Thus, the structure of the industry and the market with its specific characteristics determines the behavior of the actors, which leads to certain firm results. A chain effect occurs, where the market structure determines the market conduct of the company, which in turn determines the success of the company in its industry.[58] The potential effect of the economies of scale in an industry is important as well as the industry concentration, product differentiation, entry barriers, and the relationship between market share and the success of the firm. A high market

[57] Schindler (2015: 166, fn. 11) refers to the paradigm as follows: "The Structure-Conduct-Performance-Paradigm (SCP-Paradigm) is a principal approach to analyze industries regarding its market power profitability interdependencies and relationships. The paradigm implies a relationship between the structure of the market, the conduct, and the performance in the way that the performance of a firm in an industry is influenced by the behavior (conduct) of other firms in the market. This behavior is determined by their strength in the industry (structure) (Waldman and Jensen (2001: 6-7)". The paradigm focuses on homogeneity of the related enterprises and does not take individual firm resources and dynamic changes of environmental conditions into consideration which leads in effect to a single-sided view to the market. Schindler (2015: 166, fn. 11) continues that "The critics regarding the consideration of feedback effects in a reverse direction (from performance via conduct to structure or from performance directly to structure) is integrated in an already made rework of the approach (Minderlein, 1993: 168; Schmalensee, 1985)" Cf. also Shapiro (1989a; 1989b) and Tirole (1999). Zu Zu Knyphausen-Aufseß (1995: 51) argues that there is no need to use the SCP-paradigm due to the further development of industrial organization research.

[58] Cf. Wirtz (2003: 38).

share promises market power and above normal profits by e.g. a limitation of the output of a firm.[59]

FIGURE 4: SCP-paradigm



Source: adapted from: Bain (1968), modified

Based on the SCP-paradigm Porter further developed and modified the idea of the industrial organization, and describes that the attractiveness of a specific industry and the relative position of the firm within its specific industry are the determinants for achieving CAs (Porter, 2000: 4) and industry profitability (Macharzina, 1999: 229; Porter, 1999: 33-34). Porter (2000: 4) argues that a competitive strategy must rely on a deep understanding of the rules of the competition within the specific industry which determines the attractiveness. Firms can use or change these rules, which were determined by "the forces governing competition in an industry" (Porter, 1979: 141). In his approach, Porter wants to explain the interactions between an industry-specific delimitatable market[60] with imperfect competition and the firms acting

[59] Mintzberg, Ahlstrand and Lampel (1998: 94) state: "Market share became some kind of Holy Grail". A relationship between market power, product quality, and profitability can be observed e.g. by the "PIMS"-study of the Strategic Planning Institute (Mintzberg, Ahlstrand, Lampel, 1998: 98-99).

[60] Marshall (1920) summarizes a market as all those firms together that produce similar goods on a physical-technical level. The focus on the "performance space" (Backhaus, 2003: 208) is problematic because the customer finally carries out the evaluation of the goods on an objective or subjective basis; thus he can get different reviews for physically and technically similar products, which can lead to a too narrow or too wide market demarcation (Meffert, 2000: 40). Triffin (1947) argues that a market consists of those achievements that are

on this market (Jaeger and Bühler, 2002: 2), by deriving a competitive strategy and the necessary resources and expertise out of the circumstances of the specific market (Porter, 1998: 23). The approach rests on five columns as competitive forces determining the competition within the structure of an industry. The columns are the bargaining power of customers, bargaining power of suppliers, rivalry among competitors, new entry of potential competitors, and the threat by substitute products. Schindler (2015: 166) states, the stronger the forces, the stronger the intensity of the competition, and consequently the lower the chances of success in creating CAs. This means that the power of these forces determines the ability of a firm to achieve average higher capital returns than capital costs (Porter, 2000: 29). If a firm is able to perform better than its competitors within its specific industry then from the structure of the industry may cost advantages result and differentiation arises.[61] The positioning of a firm in the conflict area of the competitive forces

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interconnected by high cross-price elasticity. Cross-price elasticity (T) refers to a quantitative reaction of customers to goods if the price for other goods changes and is defined by the ratio of relative change in quantity (x) of a product / output (i) and the relative change of the prices (p) of another good / performance (k) caused by them (equation: $T= dx_i/x_i : dp_k/p_k$) (Meffert, 2000: 40). The mathematical sign of cross-price elasticity gives information about whether there are substitutions or complementary relations between achievements (the bigger, the closer), so that a positive mathematic sign can be considered in a substitution relationship and a negative mathematical sign in a complementary relationship. If a link between the price change of a achievement and the amount of change in the other achievement cannot be made, there is a substitution gap (isolated selling) that separates the individual markets from each other (Meffert, 2000: 40).

[61] Depending on how the forces vary within a specific industry, for example, e.g. cooperation between the actors in the market gains in relevance. This is also confirmed by a study of Hagedoorn (2002) based on data from the MERIT-CATI database that investigated firms according to their technology relevance (OECD classification) and presents that industries with a high demand for flexibility and rapid learning have a high need for cooperation between the actors (Hagedoorn, 2002: 482). In technology intensive industries for example technical progess is

within an industry determines the firm´s ability to generate above normal profits or below average profits (Porter, 2000: 4). So the industry in which a firm is active has a crucial role in achieving CAs. Especially industries where competitive forces are inhibited in any way[62] therefore need to be highly attractive to firms because these industries offer them the opportunity to obtain monopoly rents (Harhoff and Gruber, 2002: 5). Porter (2000: 11) argues that a company can achieve above normal profits in a less attractive industry if it is able to position itself favorably. Depending on a successful positioning of the firm within the industry is a demarcation from competition made possible by higher prices or lower costs. Here the analysis and the design of the value chain are of crucial importance (Hahn, 1998: 567). In order to achieve correspondingly attractive pricing Porter distinguishes three basic strategies: (a) differentiation, (b) cost leadership and (c[63]) concentration (focusing). The approach developed by Porter is an outside-in perspective that shapes a company's value chain based on its strategic positioning on the business market (outside-in)[64] and asymmetries between firms within the same strategic sector that are pursuing similar strategies, but with varying degrees of success. The view from the market in which a company operates toward a company within an industry shall be applied, to find, ensure and defend strategic CAs and long term success, which are the basis for supernormal profits and lead a contribution to the development of added value. For the representatives of the MBV this is an important starting point for the understanding of the market and the development of a successful competitive strategy, based for example on cost leadership or differentiation. The discussion

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dynamic and knowledge correspondingly wide-spread, so that individual firms are hardly in a position to build enough capabilities in order to drive innovations forward (Powell and Grodal, 2005: 59).

[62] Porter (1999: 63) mentions e.g. the influence of the state on the industry factors and on the equilibrium on a branch of industry where the state can resctrict the behavior of customers and suppliers by legal rules.

[63] The strategy concepts of concentration or focusing are based on a concentration on specific market segments or niches in which the form or the strategy can take the form of differentiation or cost leadership (Porter, 2000: 15).

[64] Cf. Zentes et al. (2004: 27).

focuses on the firm's adaptation to the environment, the market and the industry in order to achieve CAs as the basis for supernormal profits and a contribution to the added value of the company. The goal is to build and to defend a CA over other firms in the same industry.[65] The focus is on finding a strategy that is based on industry-specific market conditions under which the firm operates. This raises the question as to why only certain firms can compete effectively and thus achieve long term returns. In the following Subchapters the concepts of mobility barriers, entry and exit barriers and strategic groups are considered. Porter sets up these concepts and applies them microeconomically in the context of the competitive forces of the MBV.

3.3 STRATEGIC GROUPS, MOBILITY BARRIERS, ENTRY- AND EXIT BARRIERS

3.3.1 Strategic groups and mobility barriers

The acceptance of non-perfect markets acknowledges the existence of market entry and market exit barriers (Caves and Porter, 1976; Minderlein, 1989; 1993) which handicap the change between strategic groups[66] within an industry.

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[65] Cf. Zentes et al. (2004: 27).

[66] Strategic groups occur from different initial strengths and weaknesses of firms, different sector entry points of time or from historical coincidences (Porter, 1999: 185). According to McGee and Thomas (1986: 149), they are attributed to "differences between firms" and "in part the outcome of deliberate decisions made by firms. Groupings are therefore seen as the result of strategic choices". Accordingly the companies are similar in strategy and approach to market shares or are concerned with changes that affect the strategic group in an equal manner (Porter, 1999: 185). According to Porter (1999: 183-184) a strategic group is a group of firms within an industry that follows the same or a similar strategy (according to strategic dimensions, such as specialization, brand identification, quality, vertical integration, product portfolio, etc.). It is possible that an industry consists of firms which all belong to the same strategic group; but any firm within a branch of industry can create its own strategic group. There can be a difference in

So strategic groups are subject to mobility barriers (e.g. size and experience advantage, replacement costs, restrictions on access to distribution channels) that can be exit and entry barriers at the same time, and that can lead to disability, if companies want to change their strategic position (Cunningham and Culligan, 1988: 154-155; Mascarenhas and Aaker, 1989: 475; Hungenberg, 2011: 131). Zimmer (1999: 61) states that markets are characterized by the existence of exit- and entry barriers, and the condition that firms face influence the size of these barriers. Companies that try to enter another than their traditional market also face barriers. Zimmer (1999: 77-78) continues that Caves and Porter (1977: 241-261)) combine the presence and the effects of exit barriers to the concept of strategic groups in an industry and emphasize the barriers evoked by established suppliers' actions. Production overcapacity, high initial investment costs, product differentiation, absolute cost advantages and government regulations act as a barriers to entry for potential suppliers in a new market, that will not only protect the individual already established suppliers, but all established suppliers of an industry. The investment in entry barriers allows established suppliers to influence the market price level of a branch of industry, and thus also to the recoverable amount of the income. Therefore the entry barriers turn into a collective good[67] of a strategic group, where all group members are interested in

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the height of the entry barriers for different strategic groups, which in turn can affect the profitability of the respective strategic group. If a company enters a strategic group it must overcome the entry barriers of that group, which must not necessarily correspond to the rest of that branch of industry. Therefore a change in the strategic group requires an analysis of both exit and mobility barriers (Caves and Porter, 1976; 1977) of the strategic group to which the company previously belonged, as well as an analysis of entry barriers of the strategic group the firm wants to join.

[67] Cezanne (2002: 35) describes the characteristics of a collective good as follows: a) non-rivalry in consumption: the use of the good by a consumer does not affect the use of the good by another consumer and b) the non-excludability. Regarding non-excludability Cezanne states (2002: 35): „Es ist bei öffentlichen Gütern außerordentlich aufwendig […] jemanden vom Konsum des Gutes auszuschließen." (Translation from GER according to Cezanne (2002: 35): "It's

its preservation, make appropriate investments to maintain it and due to that also make it more difficult to weaken the exit barriers for the group members. The members of such a strategic group may foresee that behavior because of their structural similarity and thus coordinate their moves. Caves and Porter (1977: 251) state: "Because of their structural similarity, group members are likely to respond in the same way to disturbances from inside and outside the group, recognizing their independence closely and anticipating their reactions to one another´s moves quite accurately." The anticipation of moves due to the structural similarity of group members allows them to monopolize an industry or quasi to control the level of above-average income achieved. Especially in regulated industries such as the airport industry, with special barriers to entry (e.g. a necessary qualification procedure of potential suppliers) the number of established firms is very clear[68]; the established manufacturers usually know their competitors, probably have experience in jointly offered projects and therefore also know the cost structures in general. This knowledge of members of a strategic group is used by other group members as a reference for management decisions (Fiegenbaum and Thomas, 1995: 461-476). Therefore, group members are nearly able to anticipate the price level of an offer for a requested BHS and can

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extremely complicated with public goods [...] to exclude someone from the consumption of the goods."). Olson (1998: 35-36) distinguishes between inclusive collective goods (no exclusion from consumption, no consumption rivalry) and exclusive collective goods (no exclusion from consumption, but consumption rivalry). The members of one or more strategic groups within a market build an entry barrier to defend the market from unestablished firms. The non-established firm is not a member of the strategic group, as it has not overcome the entry barrier and is therefore positioned outside of the target market. Under the precondition that no free riders exist the good (entry barrier) is jointly funded by all members of the strategic group; the benefits (successful defense of the unestablished firms) benefits everyone equally. According to Olsen (1998: 35-36) the entry barrier is a collective and specifically an inclusive collective good of the strategic group, as each user enjoys the full benefit proportion, no member of the strategic group is excluded and no consumption rivalry exist.

[68] Cf. in detail Subchapters 8.1 to 8.4 and 10.3.

plan own moves for its positioning in the group of a bidding group. For the bidders of the strategic group the market price level remains within a reasonable range. The lack of information about the range accepted by the customer, and therefore the risk of over- or under-bidding, functions as an entry barrier for potential new entrants. A potential new entrant can break through this entry barrier only by high initial investment with strong risk elements, or by the attempt of belonging to a different strategic group within the branch of industry, as it has to invest in a qualification process[69] that is part of the tendering process. After that he has to prepare an offer, which is resource binding and thus cost intensive, but that can serve him as orientation in determining his own possible position within the branch of industry. This leaves the new entrant with certainty about his own position in the bidding structure after the award and the publication of the procurement price. The lack of knowledge about the own position among the established competitors, and the high risks for a new entrant in a new market to lose the initial investment act as a high entry barrier and provide effective protection to defend the market position already established by the strategic groups. Therefore, Hungenberg (2011: 131) states that „Die Mitglieder einer strategischen Gruppe mit hohen Mobilitätsbarrieren haben deshalb grundsätzlich ein größeres Gewinnpotenzial als Unternehmen, deren strategische Gruppe geringere Mobilitätsbarrieren aufweist“[70] and recommends in that case to analyze the structure of the branch of industry individually for each strategic group.

3.3.2 Entry barriers

Entry barriers are a key element of the market analysis of the industrial organization (Bain, 1956). A distinction is made between established firms who

[69] Cf. §24 (1) SektVO that allows the customer to install a pre-qualification process.

[70] Translation from GER according to Hungenberg (2011: 131): "The members of a strategic group with high mobility barriers have therefore in principle a greater profit potential than companies whose strategic group has lower mobility barriers".

already supply products in an industry, and potential suppliers, which means e.g. firms who are not yet established in an industry. Bain (1956: 5; 1968: 252) argues that firms who join an industry are not among the potential suppliers, since the production capacity within the industry is not increased by an additional member. The height of an entry barrier in a branch of industry largely depends on how established firms succeed in being able to raise and maintain their offered prices in the long term above a given minimum average cost level of their competitors, without stimulating potential new entrants (Böbel, 1984: 27). Bain (1968: 253) states that "The condition of entry is measured numerically as the percentage by which the maximum entry-forestalling price exceeds the minimum attainable average costs of established firms". Bain (1968: 255; Böbel, 1984: 27) distinguishes between three groups of entry barriers: (a) advantages of established suppliers due to economies of scale[71], (b) advantages due to absolute cost advantages and (c) advantages of established suppliers due to product differentiation. Porter (1999: 37-45) mentions five relevant sources for the existence of entry barriers and argues that beside "economies of scales" (Porter, 1999: 37), product differentiation and the need of a firm for capital, switching costs and the access to distribution channels are causal for the formation or the existence of entry barriers and can be subsumed in three groups mentioned above by Bain (1968: 255).

Advantages by economies of scale provide an entry barrier that is difficult to overcome for non-established firms or potential entrants, as they force the new non-established or potential entrant on the one hand to enter with a high production volume[72] in the market and risking reprisals or retaliation by the

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[71] According to Porter (1999: 38) Economies of Scale „(…) liegen dann vor, wenn die Stückkosten eines Produktes (oder einer Operation oder Funktion, die in die Herstellung des Produktes eingeht) bei steigender absoluter Menge pro Zeiteinheit sinken." (Translation from GER according to Porter (1999: 38): Economies of Scale "(…) exist when the unit cost of a product (or of an operation or function that goes into the manufacture of the product) decreases when the absolute numbers per time unit increase".)

[72] If the new supplier is not able to achieve competitive advantages from product differentiation or absolute cost advantages, he must aim at a production

already established suppliers, or to decide to enter with a low production volume in order to decrease the risk of retaliation but to accept a cost disadvantage. In branches of industry (e.g. airport baggage handling), where there are few projects and thus a limited number of necessary products, high production volumes are hardly achievable for new entrants, but there is a significant risk of cost disadvantages. Diversified firms with different business units or firms that would be able to cooperate with other firms to generate synergies from their activities would probably be able to minimize the mentioned risks. If a new supplier with a high production volume now enters the industry, and if the established firms do not reduce their output accordingly, the quantity of the products available in the market increases (supply surplus), which can lead to a reduction in the market price level and to a situation where the new entrant is no longer able to cover his costs. The established firms can respond by setting the market price on an amount exceeeding the competitive price to the market price that would fall if the entrant succeeds, which is an effective entry barrier (Bain, 1968: 264; Sylos-Labini, 1969: 40).[73] Based on economies of scale Bain (1956: 16) mentions the following entry barriers:

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volume that allows his firm to operate above the "minimum efficient firm size" (Böbel, 1984: 28; Bain, 1968: 164-165).

[73] This assumption of this behavior is part of industrial organization under the name "postulate of Sylos-Labini" (Sylos-Labini, 1969: 40-41). The underlying reasoning is that when economies of scale are in place, established suppliers are able to set an "entry-preventing price" (Sylos-Labini, 1969: 40), if potential new entrants assume that the already established suppliers will not reduce their output accordingly. This is criticized by Scherer (1973: 228-229) who states that if, in the case of the entry of a new supplier, the established suppliers would reduce their prices to competition level, it would also reduce their profits. A cooperative pricing policy with the objective of short-term profit maximization or of raising the entry-preventing price would be more rational, even more if the new supplier can assume that the established suppliers do not want to reduce the market price permanently by maintaining their output. Since the potential new entrants in the market are aware of this and also of the fact that after entering the market a

(a) Real existing economies of scale (due to division of labor or the distribution of a larger amount of indivisible production factors of the established firms) in the fields of production, sales, „Einkauf, Forschung und Entwicklung, Marketing, Servicenetz, Vertretereinsatz“[74] (Porter, 1999: 38) which can be used if a bigger market share shall be served,

(b) Due to high output occurred monetary economies of scale that lead to greater bargaining power of the established suppliers (e.g. lower purchase prices due to higher demand quantities[75]), and

(c) Real and monetary economies of scale that result from marketing activities.

Absolute cost advantages of established suppliers can also lead to the existence of entry barriers, if the established suppliers have in any comparable output lower production and distribution costs than their potential competitors (Bain, 1968: 261) and therefore the market price can be raised to the level of average production and distribution costs of the potential new supplier, without risking that they enter the market. Bain (1956: 15-16) gives the reason for as follows:

(a) The established suppliers have exclusive use of particularly efficient production methods and are protected by e.g. patents, utility models, confidentiality, etc. or by taking advantage of the experience curve effects.

(b) The disposal and control about strategically relevant sources of production factors and imperfect factor markets allows the

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coordinated price policy for all is profitable, they will hardly be deterred by it (Mintzberg, 1987).

[74] Translation from GER according to Porter (1999: 38): "purchasing, research and development, marketing, service network, deployment of sales representatives".

[75] Market regulations are not always achievable. One example is the market monopoly of Chinese producers for rare earths as a raw material in many industries (e.g. electrical industry, industrial motors) where the prices are almost set independently of the required quantities and are supervised by the state.

established suppliers to get production factors at lower costs than it would be possible for the new entrants.

(c) Production factors that are so limited available that it would come with new entrants in any case and inevitably to price increases in the market.

(d) The capital requirements that new suppliers will need for the development of market shares, raises one hand the demand for capital in the market (excess demand) and on the other hand it leads to the fact that the interest rate increases in the market.

Due to the risk (e.g. loss of capital by failure) that investors face if they grant capital for new entrants that is lower or more predictable for established suppliers, have the established firms the option to get capital at lower costs of capital than unestablished firms.

Advantages based on product differentiation can also be an effective entry barrier, particularly if established firms have property rights, for example in the design of products (Bain, 1956: 16; Böbel, 1984: 29). Established firms may be able to achieve a brand or manufacturer loyalty due to higher product awareness among customers (Bain, 1968: 255) or to execute control about the distribution channels (Porter, 1999: 41-42). This is based on a first mover effect, because the established firms were quasi the first suppliers in the market and were the first to have the opportunity to develop product and company loyalty of the customers. Therefore, a new entrant is forced to use considerable resources in order to overcome existing customer loyalty, to accept losses in regard to time and market entry and to deal with the risk of developing their own brand name[76] (Porter, 1999: 40).

3.3.3 Exit barriers

Exit barriers are usually associated with durable and specific assets that are not simply removable from the firm that uses them in the longer term (Caves and Porter, 1976: 40-41). By this is meant e.g. goods that are impossible or difficult to

[76] The failure of the entry causes sunk costs because the brand name has quasi no residual value anymore (Porter, 1999: 40).

trade, like brands, special machines which are used for one purpose only, or usable skills of workers for the manufacture of one specific product. Exit decisions are often associated with considerable costs for the termination of employment contracts and contracts for the dismantling of production facilities[77] and with an extraordinarily high demand for information. Due to the absolute cost advantage, differentiation advantages and economies of scale, parallels to the entry barriers can be drawn as follows:

(a) absolute cost advantages are based on the right to dispose of industry-specific resources which is connected with difficulties or excessive costs, and whose acquisition is possible for potential competitors,

(b) product differentiation advantages, which often result from marketing activities and are difficult to trade and get lost in market exit and

(c) that base on economies of scale and are often based on the presence and the specific usage of complex, large and long-living production systems.

Related to (a), (b) and (c) are exit costs which the firm would lose, if it would see an option in the exit from a market. Therefore, benefit considerations of the management may also be an exit barrier, because the general public can interpret the admission of the firm to the industry as a faulty decision. Without a change of management, the management involved in the admission will try to compensate for the faulty decision by cross-subsidies from other business areas (Gilmour, 1973). Hence, exit barriers are often based on the costs that firms had to spend for the construction of entry barriers and can therefore lead to the hesitant construction of entry barriers (also considering a potential exit at the earliest possible time) in order to not become a victim of one's own barriers (Caves and Porter, 1976: 45).

3.4 COMPETITIVE FORCES

The competitive forces an industry faces can be explained by the application of Porter´s model of the five forces of competition. The model answers the

[77] An example is the restoration of landscapes after discontinued coal mining. There are costs associated with filling in excavated soil, afforestation and greening that translate into reclamation costs.

question about what kind of competitive forces industry members are facing (Thompson et al. 2005: 50). It shows that the strategy of a firm has to align with existing environmental conditions. A strategy is "the creation of a unique and valuable position, involving a different set of activities" (Porter 1996: 68), its combination (Porter, 1996: 70), "creating fit among a company's activities" (Porter 1996: 75), and has to consider past information as well as changes in future (Nagel and Wimmer, 2002). Finding a strategy which is different from competitors may decide about the success of a firm. The model can be used as a tool to systematically analyze the principle of competitive pressures in a market (Thompson et al., 2005: 50). Porter (1999: 33-64; 2000: 29) describes five forces of competition that determine "in its total" (Porter, 2000: 29) the profitability of a firm in a specific industry, and argues that different competition strategies support the fact that firms achieve a status to obtain a profitable position in the competition within an industry. This position can be defended in relation to the competition-determining forces (Porter 2000: 37).

The five determining forces which were presented in Table 6 Porter (2000: 29; 1999: 33-64, cf. also Figure 5)) are described in general as (a) potential new competitors, (b) customers, (c) suppliers, (d) substitute products, and (e) competitors within the same branche of industry and details (Porter, 1979: 141) as: "The industry - jockeying for position among current competitors", "The threat of new entrants", "The bargaining power of customers", "The bargaining power of suppliers", "The threat of substitute products or services", which have an influence on the strategy of the firm and the attractiveness of the specific industry.

TABLE 6: Individual factors in the analysis of the industry structure

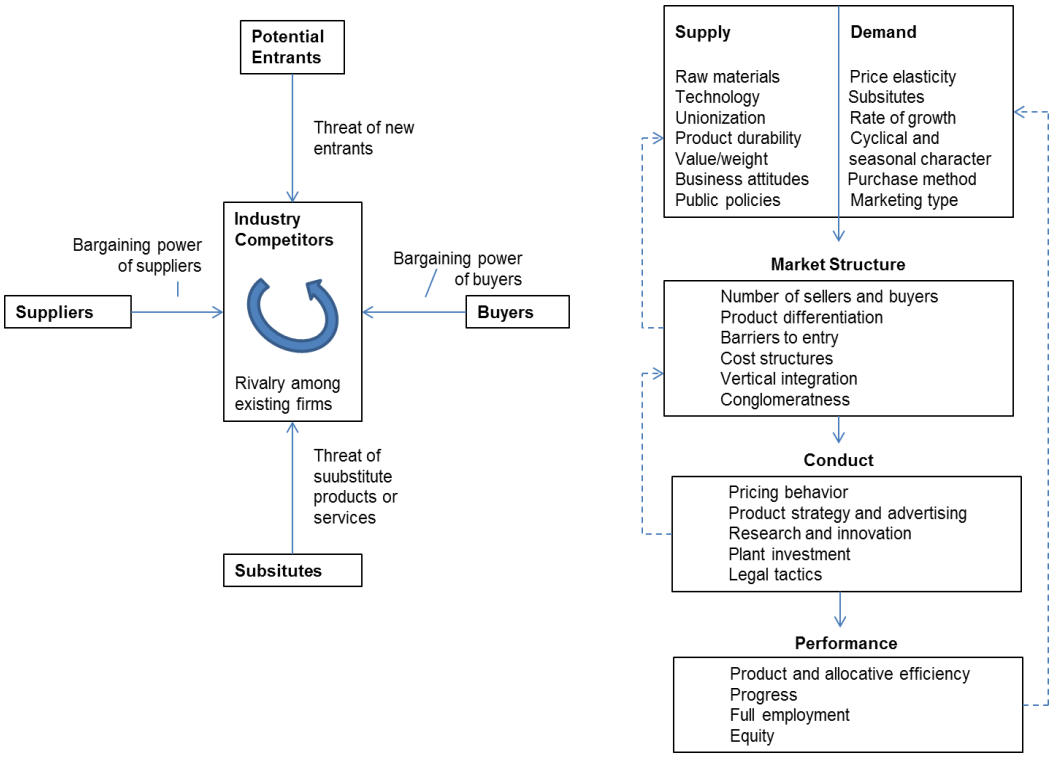
Component	Factors
Suppliers	Product differentiation, switching costs, importance of purchasing, supplier concentration, risk of backward integration
Potential new competitors (new entrants)	Economies of scale, product differentiation, capital needs, switching costs,access to sales channels, influence of the state
Customers	Product differentiation, switching costs, importance of purchasing, customer concentration, risk of backward integration
Substitute products	Price / performance ratio, switching costs, customer attitudes
Competitors within the same branch of industry	Number of competitors, excess capacity, product differentiation, exit barriers

Source: adapted from Hungenberg (2011: 108); modified

Porter´s model can be used for the external analysis of the determining factors for a branch of industry (Hungenberg, 2011: 107); it considers the most important single factors (see Tab. 6) for the mentioned five components of the structure of a branch of industry (Hungenberg, 2011: 107). It should be noted in the application of the industry structure analysis model that this has been developed for slow-growing oligopoly markets where the product and geographic market definition is unambiguous; markets with higher dynamics due to constantly changing limitations and unstable structural features are harder to present (Hungenberg 2011: 108).

The figure below presents Porter's five competitive forces in contrast to the SCP-paradigm.

FIGURE 5: Comparison of Porter´s Five Forces of competition (left) and the SCP-paradigm (right)



Source: adapted from Teece (1984: 95)

The long term success of firms will largely be determined by differences among the competing firms in the specific industry, which becomes more relevant if the industry is characterized by certain limitations. Such limitations can be market restrictions, set by legal rules (e.g. SektVO, GWB, VOB, etc.), the specificity of the product, limited access to resources, etc. With a preview to Subchapter 8.6 which describes in more detail the overall legal conditions determining the business within the airport baggage handling industry and its limitations, a certain level of product homogeneity is required. Homogeneous products imply that competitors cannot be differentiated by their products. Schindler (2015: 168) argues that it can be assumed "that in such a market is the risk of the substitution of the own product (an easy exchange due to its homogeneity) quite high if the customer is not able to recognize a value that

he counts higher than at the competitor". The interpretation of the five forces of competition will be made under this premise.[78]

3.4.1 The bargaining power of customers

With a preview to the Subchapters 8.6 and 10.3 it is necessary to understand that the German market for airport BHS[79] can be described as an oligopoly,[80] which means that a low number of customers meet a low number of potential suppliers. Customers can be divided related to their scope of interest in (a) final customers (airport), who use the BHS as a part of their core processes, (b) OEM,

[78] Cf. Schindler (2015: 168-169) and based on own analysis.

[79] The term system is defined differently in the literature. Von Bertalanffy (1950: 143), who characterized the General System Theory, defines a system as follows: "A system can be defined as a complex of interacting elements […]. Interaction means that the elements stand in a certain relation, R, so that their behavior in R is different from their behavior in another relation, R`." Backlund (2000: 444) defines: "A system is a set of interacting units with relationships among them." DIN IEC 60050-351: 2009-06, 351-21-20 describes a system from the technically perspective as a „Menge miteinander in Beziehung stehender Elemente, die in einem bestimmten Zusammenhang als Ganzes gesehen und als solche von ihrer Umgebung abgegrenzt werden können" (Translation from GER by the author: "Number of interrelated elements that can be seen as a whole in a certain context and as such delineated from their surroundings").

[80] The market forms monopoly and total competition are not of real relevance within strategic management approaches (Schreyögg, 1984: 8) due to the fact that in a situation of total competition there is no established price range, as firms can only adjust prices and quantities and achieve no or only very small profits in the long run (Gutenberg, 1984: 235-235) so that the market can be seen as static (Schumpeter, 1964: 75). With the monopoly situation no alternative to the Cournot-point (combination of price and quantity where the profit is at maximum) is given. A situation of many suppliers with identical products and identical prices will lead to a situation of oligopoly (Zimmer, 1999: 49) and an omnipresence of oligopoly situations (zu Knyphausen-Aufseß, 1995; 58).

who designs, manufactures, and installs the baggage handling system according to a certain specification agreed with the final customer, and (c) customers offering special subsystems directly to (a) or (b) in order to complete a system or to increase the performance of a BHS made by an OEM. Depending on the perspective and the position within the value chain the customer type (b) and (c) can also act as a supplier to other manufacturers, who then supply the whole BHS to the final customer. In the following the airport as type a will be named as customer and all other types will be subsumed under the terms manufacturer or supplier. Due to the market limitations by legal restrictions and the low number of available projects the bargaining power of the customer is quite strong. Technical specification requires a direct comparison between suppliers within the technical project specification. That means that the product the customer is intended to buy is described by a clear technical specification and its performance. This leads to technical product-related homogeneity among suppliers and to strong bargaining power for customers. The risk to fail is quite low for a customer, due to a low level of uncertainty, because only potential and qualified suppliers are prequalified to place an offer. To be classified as a potential supplier, the customer approves the relevant business knowledge, achievement efficiency and reliability and has the option in case of a non-approval to exclude the potential supplier from the tender (§§20; 21 SektVO, §98 GWB). Therefore the check of a potential supplier for approval usually takes place before a invitation to make an offer is made by the customer. Usually the customer will select those candidates whose aptitude provides the necessary fulfillment of the contractual obligations and security and thus have the necessary skills, achievement efficiency and reliability and the relevant access to adequate technical and economic resources. This offers the client the possibility to limit the group of potential bidders according to his own objective (§20 (1) SektVO) criteria which can probably be influenced by subjective perspectives.[81] This is most likely also supported by the quasi homogeneity of the requested achievements, which will save the customer from having to focus on technical features. Due to the product homogeneity set by the technical specifications, the customer is able to interchange the product of one firm with a competitor´s product, because both

[81] Cf. in detail the Subchapters 10.4 to 10.7 and Subchapters 11.1 and 11.2 .

products have the same specification, the same dimensions, and the same function specified by the customer (Schindler, 2015: 168). That means in consequence that the interchange of the product, also related to costs and product prices, would not have any significant impact on the processes of the customer, which increases the customer´s certainty and bargaining power (Schindler, 2015: 168). Product homogeneity also supports a price decrease within the industry, which can be steered by a reduction of customer demand, as well as a quality increase due to the possibility to interchange between suppliers. The product homogeneity caters for customer project-related product standardization and in this way increases the bargaining power of the customer.

3.4.2 The bargaining power of suppliers

The suppliers of BHS almost face the opposite situation to the one presented in the previous chapter. One of Porter´s main arguments to craft a strong bargaining power of suppliers is the differentiation of the input (Porter, 2000: 32).[82] The reduction of the possible input of the supplier to technical product issues makes a significant differentiation nearly impossible. This means in fact that product differentiation, one of the strongest arguments for suppliers to build bargaining power, cannot be applied to the customer in the airport baggage handling industry. Schindler (2015: 168) argues that "Therefore the position of the supplying firm opposite to the customer is quite weak, because the customer is able to focus the negotiations on the price of the homogeneous product, which will influence the value and the availability of the economic rent which the supplier has calculated". The position of the supplier is weakened even further due to the possibility that the customer requires information about the potential supplier´s firm-specific costs, which are used to calculate the quotation.[83] Schindler (2015: 168) continues that "If under these preconditions the supplier tries to resist the price requirements of the customer and moves into a direction

[82] Cf. Schindler (2015: 168-169) and own industry analysis by the author.

[83] Such as: costs for labor, material, overhead, etc. in percentage related to the total value offered. In practice the customers argue that they are obliged to evaluate the ability to execute an achievement and refer to §21 SektVO.

close to break the tolerance range of the customer, the supplier risks to be interchanged against the competitor". However, under these conditions the bargaining power of a sub-supplying firm (e.g. supplying components or services), which are necessary to produce the homogeneous product is quite strong, because the sub-supplier is probably also able to build a business relationship with all the competitors who produce the homogeneous products (Schindler, 2015: 168).[84] Once the technical tender document has been issued it is nearly impossible to change the technical specification fundamentally. In case of necessary changes all prequalified suppliers get the information in time to adapt their activities, so that there is no time advantage for individual firms.[85] This weakens the position of innovative suppliers, who develop technical solutions in order to increase the efficiency of the system, so that these firms keep their solutions probably hidden in order avoid a weakening of their overall competitive situation within the baggage handling industry.

3.4.3 The threat of new entrants

Porter (1999: 37) argues that the risk of new entrants that the competitors face depends on the efficiency in using resources in order to generate economic rents. This is connected with the entry barriers, which new entrants face in the industry and with the expected reaction by already established firms (Porter, 1999: 37; Schindler, 2015: 168). Thompson et al. (2005: 55) argue that the bigger the pool of entry candidates, the stronger is the competitive pressure in an industry. Porter (1999; 37) argues that new entrants lead to additional capacities, which can lead to price decreases or an increase of the costs of established competitors. The result is in consequence a drop of the profitability (Hungenberg, 2011: 103). Schindler (2015: 168) argues that "If the price level on the market for homogeneous products is on break-even or below, the possibility to earn

[84] This also implies that the suppliers of homogeneous products can (but not necessarily need to) use homogeneous components from sub-suppliers if these components fulfill the supplier´s requirements on such components (in terms of quality, lifetime, performance, etc.).

[85] Cf. Subchapter 8.6.4 and §98 (1); (2) GWB regarding procurement principles.

economic rents is not given and the motivation to enter the market is low". That means, the smaller the threat of unestablished firms who want to enter the market, the more attractive is the respective industry for already established companies (Hungenberg, 2011: 103) and the sooner it is worth to prevent the entry of competitors by appropriate measures. If the market behavior of already established manufacturers of homogeneous products is based on co-existence in positions where they share the market, then it opens the option for growth or to maximize the rents of the established firms, and a change of the situation focuses on the efficient implementation of resources (Schindler, 2015: 168-169). New entrants provoke a decision by the already established firms in how to deal with the situation. Therefore, a possible decision by the established firms might be to accept the entry of the non-established firm, if they assess, e.g. unlike the non-established firm, that it is not, or only partially able to overcome the entry barriers, or only to do so with obvious competitive disadvantages (e.g. related to price, technology, etc.).

The established firms could associate the acceptance of the market entry of unestablished firms with a certain calculus, or an expectation of failure (e.g. lack of information, technological disadvantage, missing or non-optimal access to customers, etc.). This situation might be applied by the established firms as a deterrent example for all other unestablished firms and to strengthen the competitive position of the established strategic group. Likewise, the established firms may also decide to exclude the new competitor, or to start a price war as a possible defense strategy. With the exclusion of the new competitor from the beginning the entry barriers must be high enough, so that unesteablished firms have quasi no option to enter the market or are unable to utilize any chance they may have (e.g. from an economic and / or technical perspective). For example, this could be the case, if the capital needs (Thompson et al., 2005: 57) or the necessary investments for the entry would be so high that they exceed the expected return and the achievable rents would be below expectations. High amounts of industry-specific investments, like in advertising, sales promotion, R&D or infrastructure limit the number of possible unestablished firms and increase their risk (Hungenberg, 2011: 103-104). Furthermore, established firms may have built such

a competitive position within the market – e.g. by setting an industry standard[86] - which would leave no or only a small space for the penetration of a not yet established firm. If a non-established firm should use the space for the penetration then the established firms could use their market postion by cost advantages to force the unestablished firm to reach break-even earlier than the established firms.[87] Cost advantages could be generated through early access to information, cumulated intra-organizational and cooperation-based experience with the customer, an organizational structure customized to the industry´s needs, industry-specific knowledge, and economies of scale (Hungenberg, 2011: 103).[88] The unestablished firm will usually have higher expenses and therefore higher costs in order to establish itself in an branch of industry, compared to those firms that are already established. The lower level of prominence of an unestablished firm ensures that it needs to enter the market on a smaller scale than the established firms, and is forced to break up existing connections between established firms and customers at great expense (Hungenberg, 2011: 103). For example, the cost of storage could increase if the unestablished firm perceives conditions in the target market, to which it was not previously exposed. For example, there would be possible investments in storage capacities in order to realize short delivery times (Porter, 2000: 617) or the establishment and financing of a consignment warehouse or the provision of an efficient service organization in order to exceed necessary warranties. Also the conversion costs of a customer and the compensation of the risk to fail he faces with an unestablished firm as supplier for a system must be considered and cannot be ignored. It is anticipated that the customer will compensate the risk by price reductions, resulting in lower profitability or a less attractive ratio of costs and revenues for an unestablished

[86] Grant (1991: 118) states: "An industry standard (which raises costs of entry), or a cartel, is a resource which is owned collectively by the industry members." Grant (1991: 134, fn. 13) continues additionally "(…) such jointly owned resources are "public goods" – their benefits can be extended to additional firms as negligible marginal cost."

[87] Cf. Subchapter 3.3.2.

[88] Cf. Bain (1956: 16) and Subchapter 3.3.2 concerning entry barriers and the effects of economies of scale.

firm, which in consequence reduces the attractiveness of its market entry. Therefore, a price competition between established and unestablished firms is a significant risk for the unestablished firm and can lead to failure of the entry into the branch of industry or make this impossible from the beginning.

A retaliatory measure to an unestablished firm entering the branch of industry might be that established firms influence its ability to function via a third party, such as the state, or by influencing the application of design standards and regulations. This could be done through targeted support of those political movements that would increase the mobility barriers. That means according to Porter (2000: 619): „Jede staatliche Politik fördern, die Barrieren erhöht.“.[89]

This could be done, for example, by supporting the intensification and expansion of safety and environmental protection measures, the suggestion of depth product testing, the expression of doubts concerning the products and methods of the competitor (Porter, 2000: 618) as well as by respecting ethical principles and social values. Further possible retaliatory measures might be the formation of coalitions (e.g. in the form of a consortium[90;91]) among the established firms who can demonstrate their determination to retaliate the market entry of the unestablished firms.

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[89] Translation from GER according to Porter (2000: 619): “Foster every policy of the state that raises the barriers."

[90] Consortia are required under certain circumstances due to the complexity and the scope of a tender subject. Several bidders close together so that they make a common offer for the tender subject. Due to the legal conditions to protect SME, larger contracts are divided into lots acc. to §97 (3) GWB. If this is not possible consortia are allowed (VK Thüringen, Beschluss vom 16.02.2007-360-4003.20-402/2007-001-UH- and decision of VK Bund, Beschluss vom 01.02.2001-VK1-1/01-), translation from GER: “Decision of 16.02.2007-360-4003.20-402/2007-001-UH-“; “Decision of 01.02.2001-VK1-1/01-“).

[91] Cf. §22 SektVO that enables the customer to require a certain legal form of a alliance if it is necessary from the customer´s perspective and sets the alliance in this case as equal to a single firm.

So the established firms could signal to the market that they have the possibility, based on the use of their existing reputation, to expand existing capacity even before the emergence of a demand, thus creating excess capacity that demonstrates their serious intent to retaliate to unestablished firms (Porter, 2000: 622). Entering into a consortium, or being a general contractor with correspondingly competitive subcontractors, demonstrates unity and willingness to retaliate and withdraws the allied firms from the market - and thus their availability for a coalition with the unestablished firms. In order to respond with a coalition, an unestablished firm would be forced into an alliance with a subordinated selection of potential coalition partners (e.g. second- or third-rated), so that they face a higher risk and probrably are confronted with competitive disadvantage.

In reference to chapter 8, and the limitations within the industry, new entrants face the problem of a high degree of system complexity and of probably not having the relevant experience in planning, design, and optimization of logistical systems in an airport environment, especially if they have their usual business in other industries (e.g. automotive). The customers' requirements of airport logistics concern highest system availability through the fulfillment of the contractually agreed capacities, and meeting aviation security standards and requirements. Another problem new entries face is connected with economies of scale (Porter, 2000: 32, Hungenberg, 2011: 103) and learning curve effects. New entrants are often not able to copy the experience and necessary know-how of the established firms, which are experienced in the field of business and belong to a branch of industry leaders. The result is a lack of information for new entrants. If the information deficit cannot be healed and the information gap cannot be closed between the time of receiving the tender documents and the closing date, new entrants face the threat of not being able to calculate the risks of the project. The lack of information, knowledge and know-how can create a situation that presents industry attractiveness to new entrants which is simply not given in reality and under conditions of full awareness of the circumstances. This can lead to non-profitable calculations and offers and to a situation where the new entrant is awarded the project to financial deficits and struggling for additional payments in order to equalize financial project deficits (e.g. by claiming the cost for any additionally needed material). This means in conclusion that new entrants need to

have a certain risk awareness regarding the specific rules and requirements within the branch of industry, and a strategy to cover the risks coming with late return of project investments and losses in case of failures and with low returns on capital. Considering these points, new entrants would need strong financial resources[92] (Porter, 2000: 32). In cases of positive experiences of the final customer with a system partner, the customer's loyalty to the partner is probably high, so that customers who identify themselves with the system partner will not enter into risks in order to avoid problems during and after the project.[93] On the one hand this might be a chance for new entrants to be an alternative to established suppliers, but on the other hand it poses the risk of not being successful.

3.4.4 The threat of substitute products or services

The competition within a specific industry also crucially depends on the availability of useful substitutes. The baggage handling industry is influenced by firms producing products related to logistic industries (e.g. conveying systems for goods) that can affect the market level and lead to the situation that established competitors face increasing competition and products meeting the specification of the customer and determine the price level within the industry. The risk for the customer to make a fail decision is quite low due to the forced homogeneity of the required products.[94] That means that the possibility to interchange homogeneous products is nearly perfect for customers who want the price level within the branch of industry to drop for their own benefit. This condition is also interesting for suppliers, who have the chance to increase their market share by presenting a substitute at a lower price resulting from lower costs. That also means that the threat for suppliers to be replaced by others is high, if the industry requires homogeneous products without any possibility to differentiate via the product. Based on the fact that all potential suppliers place their offers according to the same technical system specification, the customer enforces homogeneity of the

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[92] For example to finance insurances for product liability, system availability, bank guarantees, penalties, 24-hour service, development, etc.

[93] Cf. Subchapter 3.4.1.

[94] Cf. Subchapter 3.4.1 and Subchapter 8.6.6.

product or system offered to him.[95] Technically, these systems are largely substitutable, since they have quasi identical achievement characteristics.[96]

Due to the product or system-related homogeneity, the suppliers face the challenge to differentiate themselves from competitors in order to reduce the risk to be exchanged by a substitute. Such differentiation can be carried out optionally via pre- and after sales functions of the supplier, but especially on investments in intangible assets. Therefore, trustful relationships[97] between the customers' and suppliers' actors play a crucial role and can lead to a CA for the supplying firm. These trustful relationships cannot be, or are very difficult to substitute[98] and can be perceived by the customer as a hidden or unofficial element of the product. This leads in consequence to a change from homogeneity to a desired partial heterogeneity.

3.4.5 Rivalry among current competitors

Every firm in the baggage handling industry has the ambition to improve its position and is in competition with other players. The strength of the competition is determined by the number of players, their size and concentration, the industry growth, the need for capacity utilization to cover the fixed costs and the presence of switching costs, etc. (Porter, 1999: 50-53). Additionally the specific industry conditions with nearly project-related homogeneous products support competition among the current competitors. These factors affect the rivalry between the actors, which is Porter's central driving force in the industry (Porter, 1999: 50-56). Therefore firms have the possibility to craft alliances (e.g. in the case of the threat of substitutes), co-exist, or attack each other. The analysis of the competitive situation can take place within an industry in a similar manner by the formation and investigation of strategic groups of firms within the same branche of industry, as there may be differences within an industry (Porter, 1999: 183-213).

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[95] Cf. Subchapter 3.4.1; 8.6.6 and §7 (1) SektVO.

[96] Cf. §7 (1) SektVO.

[97] Cf. Chapters 7 and 10 regarding the generation of trustful relationships between the actors.

[98] Cf. Subchapter 4.4.

Due to the structure of the baggage handling industry with its limited number of final customers (airports) there are also limitations of available projects for system manufacturers, which leads to a slow industry growth.[99] Under this precondition current competitors struggle for improvements related to their market share, which heats up the competition among them more than under conditions of fast industry growth (Porter, 1999: 51). This situation leads to the pressure on established competitors to decrease their costs in order to achieve a better competitive position and to earn an economic rent to maximize the profit. Porter (1999: 53-54) argues that depending on their industry specialization actors can face exit barriers, like a high degree of specialization (e.g. specialized departments), high fixed costs (e.g. stock with spare parts), emotional barriers (e.g. the management is not able or willing to make an exit decision, loyalty toward the customer), administrative and social aspect related restrictions (Porter, 1999: 54), and strategic correlations (e.g. an executed exit avoids an quick entry if the conditions become more attractive). If the industry profitability is low and the exit barriers for current competitors are high a situation can occur which keeps the overall profitability for all competitors on a low level (Porter, 1999: 54). That works as an entry barrier for new competitors and supports the bargaining power of customers.

3.5 GENERIC COMPETITIVE STRATEGIES

Related to the five forces of competition Porter argues three approaches to outperform competitors within an industry: (a) cost leadership,[100] (b) differentiation, and (c) concentration on core products which will be discussed in the following.[101]

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[99] Cf. Subchapter 8.1 (Tab. 17), 8.2 (Tab. 18; Tab. 19), 10.4.1.1 (Tab.34, sub-category: project availability) and Subchapter 10.4.2.1 (Tab. 54, sub-category: project availability).

[100] Cf. Porter (1999: 71-73; 77; 83)

[101] Cf. Porter (1999: 70-71; 73; 75)

3.5.1 Cost leadership

Based on the effect of the experience curve it is the goal of the strategy to achieve lower costs than the competitors within the industry. Lower costs than competitors are the major line of that approach and promise above normal profits, also under conditions of strong competitive forces. If a firm achieves a position of cost leadership it has a certain protection against attacks from competitors, because its low costs enable the firm to earn profits if other competitors operate below break-even, which is a certain protection against the bargaining power of customers (Porter, 1999: 71-73). Lower costs allow the firm a certain space to act in cases of cost increases caused by the bargaining power of suppliers. In order to achieve cost leadership a high market share is necessary as well as a low number of different products and a simple highly automated manufacturing process (Porter, 1999: 71-73). The high quantity promises significant savings in the purchase of resources. In this case, being a cost leader means that the firm must be able to produce a defined product at lower costs than the competitors, which means using the related resources better or more efficiently. Cost leadership goes hand in hand with high investments and access to capital, innovative processes, simple designed products, low cost sales system, intensive cost control and related reporting, and motivation to achieve the target costs (Porter, 1999: 73; Backhaus, 2003: 251). Related to cost advantages Backhaus (2003: 251) differentiates between static (cost advantage at a certain time) and dynamic cost advantages[102] (cost advantage over a certain time period). The dynamic cost advantage relates to (a) rationalization (potential by increasing capacities), (b) technological progress (process innovation by development activities), and (c) learning curve effects (decrease of development costs by higher quantity of units).[103] The related risks inflexibility concern product variations / -changes, cost

[102] Henderson (1984: 9) states that the dynamic cost advantage uses the instrument of the experience curve, the production learning curve and costs of various steps of the added value chain; with the outcome that a doubling of the cumulated production output results in a cost reduction potential of 20%-40% related to the added value of the real costs of a product.

[103] Becker (2001: 11) criticizes the fact that the production volume serves an end in itself, and that firms want to influence their market share by price

increases related to resources (reduces the cost reduction results), and technological changes that neglect the collected knowledge and experience effects (Backhaus, 2003: 251-252). Related to homogeneous products within the baggage handling industry, the specification decides the technical content of a product, its general design, and its performance. Following a cost leadership strategy the supplier of the system must be able to use more or less standardized components in order to get a chance to achieve effects of economies of scale and needs to combine the components to a customized system according to the customer´s system layout.

3.5.2 Differentiation

Porter (2004: 73) states that the strategy form of differentiation has the goal "to differentiate the product or service of a company and thus to create something that is regarded as unique in the industry." Suppliers of products with a differentiating advantage in the market achieve higher prices and often a higher market share than their competitors (Bain, 1968: 230). Relating this to the specific situation of BHS in the airport industry, it must be considered that although the spatial and facility related existing conditions of the customer require a more or less unique adaptation to different project-specific circumstances, the system is comparable between the different suppliers and therefore, as already stated, it must be quasi homogeneous.[104] A differentiation of the product in favor of a provider would nullify the comparability of the systems. Therefore, differentiation acts contrary to product comparability or homogenization (Gutenberg, 1984: 292), which results in a lower substitutability of products. Additionally Porter (1983: 74) states „(…) dass die Differenzierungsstrategie dem Unternehmen nicht erlaubt, die Kostenseite zu ignorieren, nur sind die Kosten

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decreases alone, and not based on experience. Jacob and Kleinaltenkamp (2004: 616) argue that increasing experience effects can positively influence especially the supplier advantage.

[104] Cf. §7 (1) SektVO.

nicht das primäre strategische Ziel“[105] but to differentiate themselves on the basis of product features. If products from different suppliers can be compared with each other, it is also possible to diffentiate from competitors on the cost side. Cost savings can be passed on (within certain limits) from the provider to the customer and then reduce the achievable profit or economic rents.[106] At the same time price dumping is eliminated through appropriate regulations in the branch of industry, because at approximately similar achievable factor prices on the market a supplier would not achieve the standard average profits or operate sustainably above break-even. Therefore, the supplier would be forced to apply distinctive claim management after the project award (during the project execution) to earn the necessary profit, or to waive making any profit. That means that price dumping would lead the customer to an increased risk related the loss of time connected with claim management that probably leads to project delays, to performance reduction, or in case of a long duration of the project to funding the supplier's financial gaps.[107] The dependence of the firms from the necessity to achieve CAs under the conditions of the legal regulations supports that they try to take any influence on differentiation or to look for possible ways to differentiate themselves from competition.

3.5.3 Concentration on core products

The concentration (focus) strategy refers to focusing on specific market segments or niches, in which the opportunity of differentiation and / or cost leadership can be used to serve a specific goal more efficiently (Porter, 1999: 75). The achievable overall market share is subject to limitations due to a conflict of goals between maximum sales and profitability (Porter, 1999: 76). Both strategies

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[105] Translation from GER by the author acc. to Porter (2000: 74): " (…) that the differentiation strategy does not allow the firms to ignore the cost side, however the cost is not the primary strategic goal".

[106] Cf. Subchapter 3.5.1.

[107] Cf. §27(2) SektVO that states that unusual low priced quotations have to be excluded from the procurement procedure.

have been discussed in the previous chapters, so at this point there will be no renewed discussion.

3.6 CRITICAL ASPECTS AND FURTHER DEVELOPMENT

In the 1980s Porter´s contribution to research and management practice obtained a maximum of attention, which in many parts continues until today (Fleck, 1995: 1), although his work today is not without controversy. Porter's approach gets critical consideration due to the fact that the achievement of CAs justifies the industry structure and entrepreneurial behavior (Bea and Haas, 2001: 24), and based on this unilateral perspective it only carries out one external and no internal analysis. Empirical studies[108] have tried to explain the success of individual companies / strategic business units on the basis of their specific strategic behavior and were repeatedly confronted to explain why different companies in the same branch of industry achieve different business successes and profits.[109] In reference to the empirical study conducted by him, Rumelt (1982) states as follows:

> "(…) firms varied not only in terms of absolute product diversity but also in the patterns of relationships they established among different lines of business. Interestingly, it was also found the corporate profitability differed significantly across groups of firms following different `strategies` of diversification. The highest levels of profitability were exhibited by those having a strategy of diversifying primarily into those areas that drew on some common core skill or resource. The lowest levels were those of vertically integrated businesses and firms following strategies of diversification into unrelated businesses" (Rumelt, 1982: 359).

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[108] Cf. Rumelt (1974); Hatten et al. (1978).

[109] For example, the Nash equilibrium of the game theory can describe situations of incomplete information (Holler and Illing, 1991: 83), where different firms achieve different profits and nevertheless are in a steady state or equilibrium, since they have used all known available opportunities to improve their situation (Rumelt et al., 1991: 11).

This means that the different profitability of firms within an industry can not be explained by industrial effects, as they are considered in MBV. Indeed a analysis of the competitive forces is helpful to understand the structure of the branch of industry, but it cannot provide information about the strengths and weaknesses of the respective actors and leaves the open question of how a firm can take advantage of opportunities and manage risks (Hungenberg, 2001: 89). This is due to the fact that Porter´s approach uses an outside-in perspective and is only oriented on the sales side (e.g. competition, customer needs). A consideration of the resources or core competencies of a firm in a inside-out perspective is not covered by the approach. The approach considers firms as quasi-homogeneous units.[110] According to Porter, the applicable competition strategy results from the combination of selected CA with the competitive environment (Porter, 1999: 37). For example, a high market share is a CA which automatically leads to quasi high profits. However, the strategy approaches chosen by Porter exclude each other because of the underlying u-shaped curve, as there is a u-shaped trend between return and market share. This means that a firm must decide whether it wants to be a cost leader or a quality leader.[111]

Firms with a hybrid competitive strategy of cost leadership and differentiation can also be successful (Lombriser and Abplanalp, 1998: 253), even with the alternate pursuit of cost leadership and differentiation strategy, if outpacing successes are enforceable (Gilbert and Strebel, 1987: 28-29).[112]

However, if the choice of strategy is neglected, the firm could become limited to market share areas of low or unsatisfactory return on capital (("stuck in the middle") Porter, 2000: 16-17)) and therefore achieve no or only little success or advantages.

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[110] Cf. chapter 6.

[111] Krüger (1994: 29-30) states that the KOMPASS-study has demonstrated that entrepreneurial success can be influenced by a clear strategic orientation.

[112] Porter argues that hybrid competitive strategies are only successful in exceptional cases, and illustrates that a cost leader must have a parity or near-parity differentiation to generate above-average success (Porter, 2000: 39-40).

Compared to that, Plinke (2000: 89) fundamentally differentiates in customer and supplier benefit.[113] The customer benefit is the relative benefit of the buyer as a difference from the perceived benefit and price; the supplier advantage describes the difference between generated revenues and incurred costs as a projection compared to the competition (Jacob and Kleinaltenkamp 2004: 605) and lies in the different capabilities, resources and characteristics of the firm (Plinke, 2000: 89). Therefore, for example, the achievement of a higher degree of achievement individualization can lead to higher customer benefit (Jacob and Kleinaltenkamp 2004: 608).

However, in an industrial goods market that is characterized by product homogeneity, customization is only possible if the product is individualized in accordance with its customized specification, but all suppliers offer an identical (homogeneous) product corresponding to the specification. Considering Porter´s perspective, Backhaus (2003: 221) argues that the following standard strategies are appropriate to achieve these advantages: (a) price leader strategy (cheaper than others), a leader in quality (better than others) and the time strategy (faster than others).

Over time, the MBV was developed further, as it was recognized that the behavior of firms is not determined solely by the market structure, but that firms also can influence the market structure, which means that Porter revised his approach (Porter, 1990: 34; Porter, 1991: 95-117) and also the importance of the

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[113] The customer benefit is immediately effective in competition and can possibly displace competitive deals, while the supplier advantage strengthens the profitability and not the competitive position directly. Therefore Plinke (2000: 89) defines as follows: „Wettbewerbsvorteil ist die Fähigkeit des Anbieters, im Vergleich zu seinen aktuellen oder potentiellen Konkurrenten nachhaltig effektiver (mehr Nutzen für den Kunden zu schaffen = Kundenvorteil) und /oder effizienter zu sein (geringere Selbstkosten zu haben oder schneller zu sein = Anbietervorteil).“ (Translation from GER by the author according to Plinke (2000: 89): "Competitive advantage is the ability of the supplier to be sustainably effective (to create more value for the customer = customer advantage) compared to his current or potential competitors and / or to be more efficient (to have lower costs or to be faster = supplier advantage".) Cf. chapter 2.

market share for the success of a firm was reconsidered (Macharzina, 1999: 272-274). The approach of the MBV as such is considered as mainly branch of industry deterministic and was criticized for undervaluing internal firm factors and possibilities (Kaufer, 1980: 509-520). According to Mintzberg the approach belongs to the school of positioning, as an optimum position of the company is stipulated in the competition (Mintzberg, Ahlstrand, Lampel, 1998: 112-118) and it illustrates that thinking and acting do not correlate and will be replaced by formal analysis without any possibility for strategic learning.

It is particularly criticized that social, political and non-quantifiable aspects (e.g. knowledge) find no attention in the approach. Also established branches of industries where large and well-known firms are active were given preference as compared to unstable branches of industries. Moreover, the importance of new markets is growing (Bea and Haas, 2001: 25). If the branch of industry structure changes, then other premises apply for the selection of the strategy. Where competition forces are stable or predictable, the foundations for the generation of a CA are given (Welge and Al-Laham, 2001: 201). Markets are nowadays increasingly viewed as dynamic, which is reflected specifically in short product life cycles and rapid decline in product and market know-how (Welge and Al-Laham, 2001: 201), which makes the structural elements of the branch of industry elusive (Hungenberg, 2001: 89). How firms behave in the competition, and the attractiveness of a branch of industry, is not only influenced by structural features, which for example apply when companies in several industries and different business segments compete with each other (Hungenberg, 2011: 109).[114]

Also the assumption that firms within a branch of industry are constantly and continuously competing with each other and can only get advantages this way (therefore only the pure consideration of competitive relationships within the

[114] Hungenberg (2011: 109-110) presents the example of PepsiCo. Drinks of the brand could not be delivered to McDonalds or Burger King for many years, because PepsiCo was a shareholder of Pizza Hut and thus stood in another business segment directly in competition with McDonald's and Burger King.

industry analysis), is nowadays regarded as largely obsolete. Thus, in addition to direct competition, for example by the establishment of cooperation and networks, firms have other options to achieve CA and to open up additional potential earnings, e.g. by expanding their own value activities, by producing complementary products and by substitution (Hungenberg, 2011: 110-116).[115] Due to the fact that the MBV views the firm under industry-specific conditions as a "black box" (Teece, 1984: 90), it does not explain what enables a firm to produce heterogeneity, nor does it consider the firm as an entity. Rather, it just shows how, in the presence of heterogeneity in an industry, this is then available.

There it turns out that a market and resource-oriented perspective for strategic management is essential and approaches that combine both perspectives

[115] Based on Porter´s analysis of the branch of industry structure an analysis can be carried out on the basis of a 5-stage-model. According to Hungenberg (2011: 110-114) the five stages can be described as follows: Profit level 1 (profit by competition) uses Porter`s industry structure as an analytical form. Profit level 2 (profit by expansion of the value) uses as an analytical form the profit-pool-analysis. That analyzes the total profit along a value chain and focuses on distinguishing less profitable value activities from the more profitable ones. Thus, it can be determined for an industry whether a branch of industry segments of the value chain can achieve profits and whether an investment in these segments would be profitable for the considered firm (Gadiesh and Gilbert, 1998: 141-142). Profit level 3 (profit by offering complementary achievements) by means of the revenue-stream analysis, which has revenue recognition over the entire life cycle of the product as basis and also encloses the product-related ancillary achievements (e.g. finance, usage compensation, repair, disposal, etc.) focuses on answering the question for other potential ways along the value chain to generate profit for the firm (Ealey and Troyano-Bermudez, 1997: 62-64). The profit level 4 (profit by substitution) takes place by means of the analysis of mobility barriers and switching costs. Profit level 5 (profit by cooperation) is achieved by means of a complementor's analysis (complementors are firms that offer complementary products additional to own products)

offer a more complete solution. Therefore, the MBV as an instrument is not applicable to answer the question about the generation of CAs comprehensively under conditions of homoneneity and the related crucial importance of intangible factors.[116]

[116] Cf. Chapter 6.

4 RESOURCE-BASED VIEW

4.1 DEMARCATION TOWARD MBV

Firms are „(…) in einem Spannungsverhältnis, sich zugleich auf die Ressourcen der Unternehmung wie auch auf die Chancen und Risiken des Marktes konzentrieren zu müssen“[117] (van Well, 1996: 161). Beginning with Porter´s contribution in the 1980s, scientific literature has increasingly dealt with the focus on the opportunities and risks in the industry and the related forces. The decisive criterion is to generate above-average profits and to select and to pursue appropriate competitive strategies for the respective branch of industries (Bamberger and Wrona, 1996: 130). The focus is on the nature of a branch of industry, despite the incorporation of entrepreneurial activities. Thus the MBV, looking for an explanation for the generation or the presence of CAs, focused on the competitive environment of firms and is based on the assumption that firms are characterized by homogeneity within a strategic group. Empirical results related to the relationship between industry structure and the success of a firm, and the insufficient involvement of firm-specific strengths and weaknesses led to greater scientific contemplation of the individual firm and its firm-specific resources and capabilities.[118] The goal was to answer the central question of achieving above-average profits and integrate the core competencies or the strategic potential for the generation of a firm´s success.

However, the resource-based view (RBV)[119] with its inside-out perspective (Wernerfeldt, 1984: 171) is in contrast to the MBV (Zentes et al., 2003: 264) and focuses on the heterogeneity of firms within an industry. Thus, it forms an

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[117] Translation from GER according to van Well (1996: 161): "(…) in an area of conflict between the need to focus equally on the resources of the firm as well as on the opportunities and risks of the market".

[118] Capability is a characteristic of a set of resources to fulfill an activity or task (Grant, 1991: 118).

[119] Cf. Schindler (2015: 169-172).

opposite pole to the outside-in perspective (Backhaus, 2003: 217) of the MBV by looking for differences within the firms of a strategic group, which probably allow achieving CAs (Barney, 1991: 114). The RBV and the contribution of resources of a firm related to its strengths and weaknesses is based on the work of Penrose (1955; 1959) and Chandler (1977). Penrose argues:

> A "(…) firm is more than a administrate unit; it is also a collection of productive resources (…) When we regard the function of private business firms (…), the size of the firm is best gauged by some measure of the productive resources it employs" (Penrose, 1959: 24).

The RBV focuses on the internal resources of a firm to explain CAs among firms, and assumes that enterprises have access to a pool of resources, which are the basis for the success of the company over its competitors. In contrast to the MBV it is the combination of resources within the enterprise that is crucial for the success of a firm in competition among other companies in the same industry. argue the RBV

> "(…) incorporates the insights of the early seminal contributions to strategic management in order to explain how firms generate rents. (…) A firm selects its strategy to generate rents based upon their resource capabilities" (Mahoney and Pandian, 1992: 364).

The RBV highlights competitiveness based on internal resources and their combination (Grant, 1991: 118). The resources of a firm and the way how a firm uses these resources[120] have influence on the market strategy of the firm and in turn affects its success (Wirtz, 2003: 38).

In the approach to the formulation of strategies Andrews (1971) refers to organizational competences and resources. Penrose (1959: 25) differentiates between resources and their use as follows:[121]

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[120] Cf. Penrose (1959: 25). Penrose differentiates resources and services related to their function and activity: "(…) resources consist of a bundle of potential services and can (…) be de-fined independently of their use, while services cannot be so defined, the very word service implying a function, an activity" (Penrose, 1959: 25).

[121] Underlined in original.

> "Strictly speaking, it is never resources themselves that are inputs in the production process, but only the services that the resources can render. The services yielded by resources are a function of the way in which they are used – exactly the same resource when used for different purposes or in different ways and in combination with different types of amounts of other resources provides a different service or set of services. The important distinction between resources and services is not relative durability; rather it lies in the fact that resources consist of a bundle of potential services and can, for the most part, be defined independently of their uses, while services cannot be so defined […] As we shall see, it is a legally this distinction that we find the source of the uniqueness of each individual firm." (Penrose, 1959: 25)

Penrose (1959: 25) argues that it does not depend on the resources alone, but rather on what a firm does with them.

In contrast to Penrose the recent work about the RBV presents that the right of disposal of resources alone is sufficient for the generation of strategic advantages (Zimmer, 1999: 109). Thus, the success of a firm is linked with the diversity and uniqueness of its resources (Conner, 1991: 122), the right to and the use of resources. Müller-Stewens and Lechner (2001: 276) state that resources in the RBV generate supernormal returns at firm level rather than at industry level, and argue that firms can be understood as a bundle of resources.[122] Additionally, Penrose (1959: 75-76) argues that firms differentiate from each other if they use broadly similar resources in a different way:

"The fact that most resources can provide a variety of different services is of great importance for the productive opportunity of a firm. It is the heterogeneity, and not the homogeneity, of the productive services available or potentially available from its resources, that gives each firm its unique character. Not only can the personnel of a firm render a heterogeneous variety of unique services, but also the material resources of a firm can be used in different ways, which means that they can provide different kinds of services. This kind of heterogeneity in the services from the material resources with which a firm works permits the same resources to be used in different ways and for different purposes if the people

[122] The RBV looks inside the firm instead of the MBV. Cf. the Subchapters 2.4, 3.2, 3.6, 6.1 and 6.2.

who work with them get different ideas about how they can be used." Penrose (1959: 75-76)

The literature presents many different approaches to define the term resources and their contribution to a firm´s success. The Tables 7a-f present an overview of some relevant approaches as a contribution to explain the RBV. In addition to the term resource, the tables also present some other terms that are included in the consideration of the RBV. Terms such as core competencies, skills and abilities are partly considered in further parts of the original RBV.[123]

TABLE 7a: Selected contributions to the RBV approach, part 1

Author	Approach	Description
Penrose (1959)	Resources	Management talent as unique and non-imitable resource. Service as achievement by physical and human resources.
Stigler (1968)	Market entry barriers	Legal market entry restrictions.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179); modified

[123] The literature also distinguishes between the competence-based-view and the knowledge-based-view. The focus of the competence-based-view is on entrepreneurial core competences of the firm as specific resources, which are critical to success for firms under specific competitive conditions (for delimitations of the term see e.g. Bürki, 1996: 67-68; Homp, 2000: 7-8). The focus of the knowledge-based-view is the knowledge that is neglected in the RBV and presupposes that knowledge is the most important factor in order to differentiate a firm from its competition (for more details cf. Grant (1996); Heck (2002)).

TABLE 7b: Selected contributions to the RBV approach, part 2

Author	Approach	Description
Prescott and Visscher (1980)	Firm-specific knowledge	Firm-specific knowledge related to customers, suppliers and employee capabilities.
Nelson and Winter (1982)	Team, routines	Discussion about teamwork and organizational routines.
Porter (1983, 1986)	Barriers	Investments in entry and exit barriers.
Wernerfeldt (1984)	Resources	Resources are firm related input factors (material and immaterial) in terms of strength and weaknesses. Barriers related to the positioning of resources create difficulties for competitors to equalize resource disadvantages.
Itami and Roehl (1987)	Invisible goods	Due to their invisibility, invisible goods are inimitable.
Lieberman (1987a;1987b; 1989), Spence (1981)	Protection against losses of know-how	Protection of experience- and learning curve effects against imitation.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179); modified

TABLE 7c: Selected contributions to the RBV approach, part 3

Author	Approach	Description
Aaker (1989)	Value, capabilities	Values are what a company owns and what makes it superior compared to its competition. Capabilities are what a company is able to perform in a superior way compared to its competition.
Prahalad and Bettis (1986), Spender (1989)	Resources	Unique combination of business experience.
Diericks and Cool (1989)	Resources	Discussion about resources that are only limited to being substituted by equivalent goods. No or only limited tradable resources.
Prahalad and Hamel (1990)	Core competences	Discussion about core competencies that are based on explicit and tacit knowledge and a network of capabilities and technologies. They have significance for the entire firm, open the firm's access to a wide range of markets, significantly contribute to the customer's perception in regard to the benefits of the product and are difficult to imitate by the competition. For strategic positioning, products are differentiated into core and end products.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179); modified

TABLE 7d: Selected contributions to the RBV approach, part 4

Author	Approach	Description
Collis (1994)	Meta capabilities	Meta capabilities enable the generation of superior resources and capabilities.
Barney (1991)	Enterprise resources	Corporate resources (ownership, capabilities, organizational processes, corporate characteristics, information, knowledge, etc.) are controlled by the firm. They allow the firm to plan and integrate strategies in order to improve the effectiveness and efficiency of the firm.
Grant (1991)	Resources, capabilities	Resources include equipping the firm with capital, skills of employees, patents, brand names, finances, etc. A capability is the characteristic of a set of resources for the fulfillment of tasks or activities.
Hall (1991; 1992) Hall and Herbane (1991)	Intangible resources	Capabilities are e.g. the know-how of the employees of the firm. Intangible values are person-bound property rights (e.g. patents, trademarks, etc.). Contribution of intangible resources to business success.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179), modified

TABLE 7e: Selected contributions to the RBV approach, part 5

Author	Approach	Description
Teece, Pisano and Shuen (1992)	Organizational capabilities	Organizational skills allow organization, coordination and control of activity sets.
Roos and von Krogh (1992), von Krogh and Roos (1995)	Competence configuration, knowledge	Configurations of competences as a synthesis of a firm-specific task- and knowledge system are responsible for the competitive potential of a firm.
Amit and Shoemaker (1993)	Strategic assets	The more unique strategic assets with the branch of industry-specific success factors, as the sum of all resources and competences, the more valuable they are.
Bogaert et. al. (1994)	Resources, capabilities	Resources (having) are the property (e.g. trademarks, patents, technical manufacturing systems, electronic information systems, etc.). Capabilities (doing) within the meaning of skill are e.g. know-how and expertise in strategic planning and control, research and development, production, etc.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179); modified

TABLE 7f: Selected contributions to the RBV approach, part 6

Author	Approach	Description
Teece et al. (1997)	Dynamic capabilities	Dynamic capabilities are necessary in rapidly changing markets in order to adapt to new environmental conditions to sustainable competitive advantage.
Eisenhardt and Martin (2000)	Dynamic capabilities	A comparison between firms is possible because dynamic capabilities differentiate depending on the market dynamics.

Source: adapted from Bogaert et al. (1994: 58); Buttermann (2003: 179), modified

All research contributions presented in Table 7a-f are generally assuming that resources are heterogeneously distributed over all competitors and that differences remain unchanged over time (Penrose, 1959; Wernerfeldt, 1984; Amit and Shoemaker, 1993). Furthermore, they emphasize the sustainability of CA (Wernerfeldt, 1984; Nelson, 1991; Barney, 1991) that can then be reinforced, if resources possess other complementary resources (Collis and Montgomery, 1999). However, it is also clear that the term resource in the sense of the RBV is not necessarily synonymous or congruent with the neoclassical resource understanding, because the term resource is more narrowly defined by the firm-specific component in the RBV (Rasche, 1994: 38).

4.2 CONCEPTUAL RELATIONSHIPS

In the context of the RBV this dissertation places the focus on the fundamental clarification of the term resource. In order to present resources according to content and meaning, the relationships with terms such as capabilities, knowledge, core competencies and cooperation will also be used.

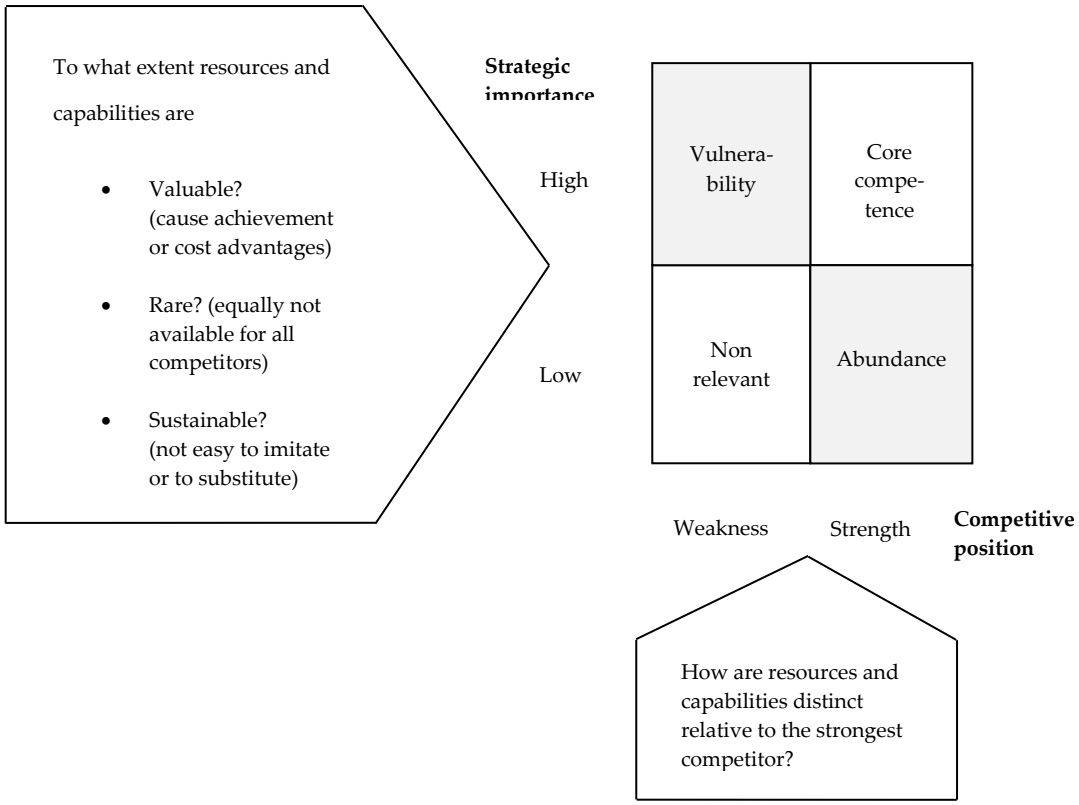
Furthermore, the relationships will also be used to clarify the concept of resources, but will not be considered in great detail and complexity within this dissertation.

4.2.1 Resources and capabilities

Resources can be defined as "(…) anything that could be termed a strength or weakness of a given firm (…) (tangible and intangible)" (Wernerfelt (1984: 172). Wernerfeldt (1984: 172) also states that a "(…) firm´s resources at a given time could be defined as those (tangible and intangible) assets which are tied semipermanently to the firm." Barney (1991: 101) describes resources based on their content, indicating the availability of strategic decisions as well as the success of effectiveness as main characteristics of resources. Barney (1991; 101) states that "Firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm". Resources of a company include ownership, capabilities, firm characteristics, organizational processes, information, knowledge, etc. under the firm's control that allow it to be able to plan and implement strategies to increase effectiveness and efficiency (Barney, 1991; 101). Aaker (1989: 91) differentiates between the ability to perform a superior achievement and the ownership of a firm. On this basis Grant (1991: 118-119) systematically differentiates resources and capabilities according to their importance for the achievement of CA. According to Grant (1991: 118-119) the individual firm's resources include the capital base of the company, the skills of employees, patents, brand names, finances, etc., which alone are not productive in themselves, but can very well be productive when combined with each other. Figure 6 illustrates resources and capabilities as a basis for achieving CAs.

On hand of examples of resources Bea and Haas (2001: 27) argue that this also includes tangible financial resources, production equipment, and facilities. In relation to the intangible resources for example, they discuss a firm´s image and know-how in this context. Basic input is the quality of resources as a basis for achieving corporate success. The capabilities of a firm, which can be found in resources and governance systems, shall enable the goal-oriented use of the firm's resources.

FIGURE 6: Resources and capabilities as basis of core competences



Source: adapted from Hungenberg (2011: 149)

Mahoney and Pandian (1992: 364) state with reference to Hofer and Schendel (1978: 145):

"(…) that a resource profile combines the following resources and capabilities: (1) Financial resources (e.g. cash flow, debt capacity, new equity availability); (2) Physical resources (e.g. plant & equipments, inventories); (3) Human resources (e.g. scientists, production supervisors, sales personnel); (4) Organizational resources (e.g. quality control systems, corporate culture, relationships); (5) Technological capabilities (e.g. high quality production, low cost plants). Grant (1991) suggests a sixth type of resource, intangible resources (e.g. reputation, brand recognition, goodwill)." (Mahoney and Pandian (1992: 364)

Dividing the resources into categories clarifies what can be understood as resources (Barney, 1991: 101; Grant, 1991: 119; Hofer and Schendel (1978: 145-146; Teece, Pisano and Shuen, 1997: 521) as presented in the following:

(a) Financial resources: They include the financial assets of the firm. The creditability and the cash flow of the firm play an important role, because not so much the actual equipment of the firm as the inflow and outflow offinancial resources is of relevance (Hofer and Schendel, 1978: 145).

(b) Physical resources: They include the material resources of the firm with plants, machinery and equipment, raw materials and supplies as well as all the material located in the property of the firm.

(c) (c) Human resources: They cover one of the most important resources of the firm (Castanias and Helfat, 2001: 661; Laursen and Mahnke, 2001: 2). Experience, knowledge and understanding by the employees are of relevant importance for achieving strategic CAs.

(d) Technological resources: They include affiliated manufacturing and process knowledge in connection with the manufacture of products that can be reflected in product characteristics. Hofer and Schendel (1978: 145) state for example that customer loyalty to a particular brand, as a result of a firm's technological capabilities, has to be included in this category.

(e) (e) Reputation: Teece, Pisano and Shuen (1997: 521) understand reputation as: "(…) a kind of summary statistics about a firm´s current asset and position, and its likely future behavior." Reputation can help a firm to achieve certain objectives toward suppliers, competitors and customers and so possibly to be able to provide long term and sustainable CA. The sustainability of the reputation as the "summary statisticy" (Teece, Pisano and Shuen (1997: 521) is closely related with the resources and the firm's position.

(f) (f) Organizational resources: They include the formal and

> informal structure that can have a direct impact on specific business objectives (e.g. the innovative power of a firm). Planning and control systems are also included in this category as formal or informal coordination mechanisms, the relationship network of the members of an organization, or common values and standards (organizational culture of a firm). Part of this category can also be the relations of a firm to its environment, the design of corporate boundaries, the integration and diversification status of the firm or of alliances and networks associated with the firm (Duschek, 1998: 230; Madhock and Tallman, 1998: 326; Teece, Pisano and Shuen, 1997: 522).

In order to be successful in the long term in the market it is not sufficient to possess superior resources[124] and capabilities. More exactly, a CA will only be achieved with other companies when strategies[125] are developed and implemented which base on firm-specific resources and capabilities, and increase the effectiveness and efficiency of the firm (Barney, 1991: 102). Therefore, optimal management of a resource portfolio (Wernerfelt, 1984: 178) is necessary, so that certain strategies and growth paths can be followed which relate to the use of existing and the development of new resources.

However, the optimal management of a resource portfolio also faces difficulties. Particularly with regard to planning the strategic value of resources and their development, time may be a valuable resource at the present time, but worth less in the future, or no longer relevant as a source of economic rents. During the development and creation of a strategically valuable resource (e.g. through technological progress) a depreciation in its value can take place. In order to counteract this, firms are required to constantly and in a timely manner anticipate the developments in their environment and the need for the strategic

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[124] Grant (1991: 118-119) understands superior resources as those resources that are tangible and build the preconditions for competitive advantages and that allow the firm to exercise its abilities (e.g. production facilities).

[125] Hofer and Schendel (1978: 25) state that a strategy is "the fundamental pattern of present and planned resource deployments and environmental interactions that indicates how the organization will achieve its objectives".

resources that are necessary for the firm's success.[126] Bogaert et al. (1994: 61) distinguish between resources and capabilities in terms of "having" and “doing”. As “having” they understand a resource that describes the ownership of resources (e.g. patent, trademark, technical equipment, etc.) and as "doing" the capabilities or skills (e.g. strategic planning, management, know-how in production and R&D, etc.) Hinterhuber and Friedrich (1997: 994) define as follows: resources describe what a firm has and what a firm can do as its core competencies, competences and abilities. Hall (1993: 609) understands intangible assets as intellectual property rights (e.g. patents, trademarks, etc.) and know-how as ability. : 3) describe meta capabilities that relate to the learning capacity of firms and differentiate between obtaining skills as a part of a learning process and the simple purchase of resources. Bamberger and Wrona (1996: 133-134) state that the exercise and maintenance of skills are closely linked to each other, because one acquired and unused skills may be lost again.

Consequently, firm-specific resources and capabilities can be differentiated as follows: a) resources in the context of "having" (ownership) and b) in skills in the context of "doing" (being able) (Bogaert et al. (1994: 61). Resources can be divided into tangible and intangible resources; tangible resources relate to e.g. machines and equipment and intangible resources to e.g. patents and licenses (Itami, 1987: 12; Hall, 1993: 609), which must be available in a firm in order to achieve a certain specific market performance (Zahra and Das, 1993: 90).

It is crucial that the appropriate resources, whether tangible or intangible, meet certain criteria and thus can be considered as a source of strategic success, which are essential for a firm to persist in competition: a) they have to be scarce (rare) in total, b) they must be valuable, c) they must be difficult to imitate and d) they are impossible or only difficult substitutable (Duschek 2004: 55; Barney, 1991: 105-106). These crucial criteria will be discussed in more detail in the Subchapters 4.3.1 to 4.4.

In order to be able to achieve CAs, Peteraf (1993: 180) refers to four criteria[127] that determine the competitiveness of firms: resource heterogeneity, ex-post limits

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[126] Cf. Subchapter 7.6.3.

[127] Peteraf (1993: 180) argues that heterogeneity is the basis for the generation of monopoly or Ricardian rents, and assumes that firms with different

to competition, imperfect resource mobility, and ex-ante limits to competition. The RBV has its focus mainly on achieving Ricardian rents. Therefore it is necessary for the continuous achievement of the Ricardian rents to ensure the superior input factors (resources), which are inelastic with regard to their occurrence and thus cause the firm lower average costs than competitors (Schindler, 2015: 170). Resources, which are used as analysis unit at the RBV, in this combination lead to economic rents (Müller-Stewens and Lechner, 2001: 276) and form the basis for the success of a firm in the market (Hungenberg, 2001: 63).

The capabilities can be divided into personal (bound to a person) skills of employees, and dynamic and organizational capabilities of the firm. Grant (1991: 119) describes capabilities as the capacity of a bundle of resources in order to achieve a task or activity. A better use of resources means that an enterprise can achieve its activities more effectively and efficiently than similar competing firms (Collis, 1994: 145). Amit and Schoemaker (1993: 35) describe capabilities as follows: "Capabilities (…) refer to a firm´s capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end. (…) They can abstractly be thought of as 'intermediate goods' generated by the firm to provide enhanced productivity of its Resources (…)." Teece, Pisano and Shuen (1997: 517) argue: "Indeed, firm capabilities need to be understood (…) mainly in terms of organizational structures and managerial processes which support productive activity", and "(…), at the end, are a matter of knowledge" (Langlois, 1992: 106). An example of personal abilities can be an employee's ability to quickly and flexibly adapt to changing working conditions or changing tasks. Another example of personal skills can be a very strong reasoning ability, which allows, for example, making decisions in less time than a competitor. In the cause of this, the personal abilities of the combination of knowledge of an employee and his personal experiences can correspond to an individual learning curve.

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capabilities or skills are able to stand in the market in competition to each other and thereby to reach at least break-even. She also states that ex-post limits to competition are necessary to sustain the economic rents, while imperfect resource mobility is responsible for the binding of the rents to the firm. Ex-ante limits to competition are required for the prevention of costs from offsetting rents (cf. Schindler, 2015: 170; fn. 16).

The contributions in the literature place particular importance on the ability of the management, because it needs to assess situations and future developments correctly and to make the necessary decisions regarding the use and combination of resources (Castanias and Helfat, 1991: 155-156). Organizational capabilities are based on the development and exchange of information between employees of a firm (Pisano and Hayes, 1995: 76) and are stored in the minds of employees (Ulrich and Lake, 1991: 77). Organizational capabilities are therefore not just limited to the personal skills of employees, but include the connection of employees through common shared experiences (Nelson and Winter, 1982: 105). For example, the structure and the method of communication in a firm can be seen as an expression of the organizational ability to review and process information for the benefit of the firm (Cohen and Levinthal, 1990: 132; Henderson and Cockburn, 1994: 66). Organizational capabilities are thus independent of individual employees and anchored in complex social routines in the firm´s organization (Collis, 1994: 145). Collis (1994: 145) states that "Organizational capabilities are not only manifestations of observable corporate structures and processes, but also reside in the corporate culture and network of employee relations".

The resources available to the firm can be influenced by the design of the resource flow, e.g. by means of dynamic capabilities (Dierickx and Cool, 1989: 1506). A distinction between dynamic and organizational capabilities is difficult, because dynamic capabilities represent a subset of organizational capabilities, thereby they are also always organizational, while organizational capabilities are not necessarily dynamic (Winterhalder, 2006: 35). Therefore Winterhalder (2006: 35) argues: „Der Besitz überlegener Ressourcen für Marketingaktivitäten wird übertrumpft von der ‚Organisationalen Fähigkeit', diese Ressourcen zu kombinieren, wird übertrumpft von der ‚Dynamischen (Organisationalen) Fähigkeit', zu lernen, wie man Marketingressourcen aufbaut und kombiniert, wird übertrumpft von der noch ‚Dynamischeren Fähigkeit', dies zu lernen (…)".[128]

[128] Translation from GER according to Winterhalder (2006: 35): "The possession of superior resources for marketing activities is trumped by the ‚organizational ability' to combine these resources, is trumped by the ‚Dynamic

On the one hand knowledge can be a strategic resource in the RBV and can serve as a basis for a CA, but on the other hand it can also be considered as an organizational dynamic ability to use and to build knowledge-based resources. In the context of the characteristics of core competencies this will be discussed in the following in more detail.

4.2.2 Core competences and cooperation

To derive new and innovative products from the existing competencies of a firm is the central notion of the approach developed by Prahalad and Hamel about core competences[129] (Hamel and Prahalad, 1992: 44), which extends the approach of the RBV. Firm-specific core competences, organizational capabilities, procedures and routines are considered as the central sources for the generation of long-lasting CAs (Duschek, 2004: 59).

The call for a permanent capacity for innovation, which is the pioneer for the development of new businesses and markets (Hamel, 1991: 83-84), let Prahalad and Hamel (1990: 83) propagate an innovative character of resources and capabilities that, bundled to core competencies, must meet the following characteristics:

- be based on explicit and tacit knowledge,
- have a firm-wide importance,
- allow the firm access to a wide range of markets,
- achieve a significant contribution to the advantages of the finished product perceived by the customer, and
- be difficult to imitate by competitors.

(organizational) ability‘ to learn how to build and to combine marketing resources, is trumped by the even more Dynamic ability‘ to learn this (...)”.

[129] The perspective of the core competences can be understood as an offshoot of the RBV (Rasche, 1994: 91).

Those resources and capabilities that will ensure the permanent position of a firm's advantage in the market build the core competencies of the firm.[130] Schindler (2015: 171) argues: "In order to assert themselves on the achievement of lasting and sustainable success and long term gains in the market, a company must be able to concentrate on core competences and is successful, if it is able to generate economic rents over a longer period of time".

Zimmer (1999: 130) argues that „(…) Kernkompetenzen als Ressourcen betrachtet werden, die das Potential zu einer größeren Menge von Anwendungen haben…".[131]

Peitz (2013: 43) state they mediate between available resources and their perception and action and are only available on the market in the medium term or only at high prices. It is problematic that the level of firm spanning characteristics of core competences is usually high (Gallon et al., 1995: 21) and a short-term extension of the core competences of a firm in response to changing market conditions is difficult to imagine.

Core competences also involve risks, namely when there are dissonances between them and the requirements set by the firm's environment. For example, major changes in the structure of an industry may dramatically reduce the value of the core competences of a firm (Prahalad and Hamel, 1990: 320).

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[130] The hierarchical relationship between resources can be represented by means of a stepped pyramid, in which the first stage consists of the generic resources (e.g. financial, organizational, technical, etc.) which in meaningful combinations lead to capabilities (second stage). If these capabilities are continuously at a high level, core competencies (third stage) emerge. These allow a withdrawal from the competition and in their entirety create space for strategic activity of the company. If this strategic space, connected with the attributes, is rare, not imitable or substitutable, and valuable, then a unique competitive advantage exists (Schneider, 2008: 25-26).

[131] Translation from GER according to Zimmer (1999: 130): "(...) core competences are viewed as resources that have the potential to a greater number of applications (...)".

Due to the focus on firm-specific core competences, the capacity of the firm to develop special capabilities and knowledge to adapt to changing environmental requirements can then be limited to non-existent.

To anticipate such changes is the responsibility of the management, as well as to rise to the challenge by a recombination of core competences already present in the firm (or by the establishment of new core competencies) or to keep the firm's position in established markets and to open new markets as a potential (Prahalad and Hamel, 1990: 342-343).

With the goal of the short-term extension of their own resources and capabilities firms are increasingly relying on the means of cooperation[132] with other firms, the more complex, the more risky and the more cost intensive a project promises to be.

Cooperation partners can be suppliers, competitors or customers. CI should be emphasized in this context, which constitutes a means of cooperation with

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[132] Collaborations (alliances) can enable firms to develop access to new technologies and to enter closed markets, to distribute capital requirements to more partners, allowing the involved firms to participate on the market reputation of others, which can lead to greater market presence and be helpful in overcoming commercial and legal restrictions (Kotler and Bliemel, 1999: 125). Kotler and Bliemel (1999: 124) distinguish between four types of alliances: (a) goods and service alliances, which focus, for example, on the marketing of complementary products from different firms (e.g. licensing, joint development of a vehicle: VW Sharan / Ford Galaxy; VW Touareg / Porsche Cayenne), (b) promotion alliances, in which a firm promotes the products of another firm (e.g. a firm's product includes a coupon for a product of another firm), (c) logistic alliances, where the logistic systems / know-how of a firm will be used for the logistics of another firm or takes it over in part or in total (e.g. a logistics service provider takes over the inventory control of spare parts from another firm and thus relieves that firm from inventory control), (d) pricing alliances in which different firms coordinate the pricing of an offer which consists of components or systems of different firms, but should be offered as a total (e.g. a BHS is offered through a general contractor or a consortium). With reference to the term consortium: cf. Subchapter 3.4.3, fn. 89 and fn.90.

customers and is the subject of consideration in chapter 7 in this dissertation. It is not to be neglected that collaboration between cooperating companies also requires dependencies and can mean negative power relations and a drain of their own knowledge. Williamson (1985: 61-63) defines the term fundamental transformation, which describes the transition from a non-specific ex-ante achievement relationship to a specific ex-post achievement relationship.

In a competitive situation with multiple suppliers, intense competition exists among the suppliers prior to contract conclusion (ex-ante). With the decision of the customer for a supplier, and the related consequence to enter into a cooperation with the supplier, the degree of specificity increases as the achievement relationship progresses. This leads ex-post to disadvantageous changes and competition conditions for the initial competitors in follow-up projects as well, and to a CA for the selected cooperation partner (Williamson, 1985: 326-351). This is due to the fact that the partners have made transaction-specific investments[133] for the cooperation - e.g. in transaction-specific tangible and / or intangible assets (like in trust) - which lead to the formation of a bilateral monopoly (Williamson, 1985: 326-351; Picot and Dietl, 1990: 179-80). Ullrich (2004: 125) states that a fundamental transformation exists if the relationship between the partners is based on intangible factors like trust.

The transaction-specific investments in the cooperation relationship can lead to the interdependence of the cooperation partner and prevent that cooperation partner, which ex-ante was exchangeable, from being easily replacable, which supports a cooperation between the partners (Picot and Dietl, 1990: 179; Kuschinsky, 2008: 91). Also asymmetric dependence allocations may exist, if the supplier has to invest unilaterally more in the relationship. The asymmetry may be accepted if the investing partner may expect cost advantages in other competitive situations, as the already made specific investments do not

[133] An example of a fundamental transformation can be the settlement of partners (site-specific, e.g. car manufacturers and their component supplying industry) close to the customer, just-in-time delivery to the customer that is customary in the automotive industry, (specific) or joint research and development projects (human resource specific).

have to be calculated again. Due to incomplete contracts[134], the dependence of the partner within the cooperation may open the scope for opportunistic behavior of the other (stronger) cooperation partner, who could thereby pursue the goal to absorb the profits of its cooperation partner by price pressure by possibly arranging a periodized contract period.[135]

The cooperation partner under pressure is trying for his part to keep the contractual relationship stable, as he cannot use the incurred transaction-specific investments if the relationship is resolved; thus he will try to limit the risk that the cooperation partner is inflicting damage by creating suitable protective measures (e.g. high exit barriers).[136] However, in very specific markets, cooperation between firms with very specific resources is more competitive than for firms that try to survive in the market without cooperation. Therefore the learning curve of firms plays a crucial role here, because the faster a firm learns, the faster it can react to changing market conditions without revealing its own competition-related resources.

The RBV, and its extension to the core competence-based approach, presents motives for the development of current corporate collaborations and also points toward problems in the realization of asymmetric cooperation, such as opportunistic behavior (Beck, 1998: 43). With their approach to the RV Dyer and Singh (1998) justify that collaborations may also establish long term and strategic CAs that are not achievable with own or third party achievements. The RV will be discussed in chapter 5 of this dissertation.

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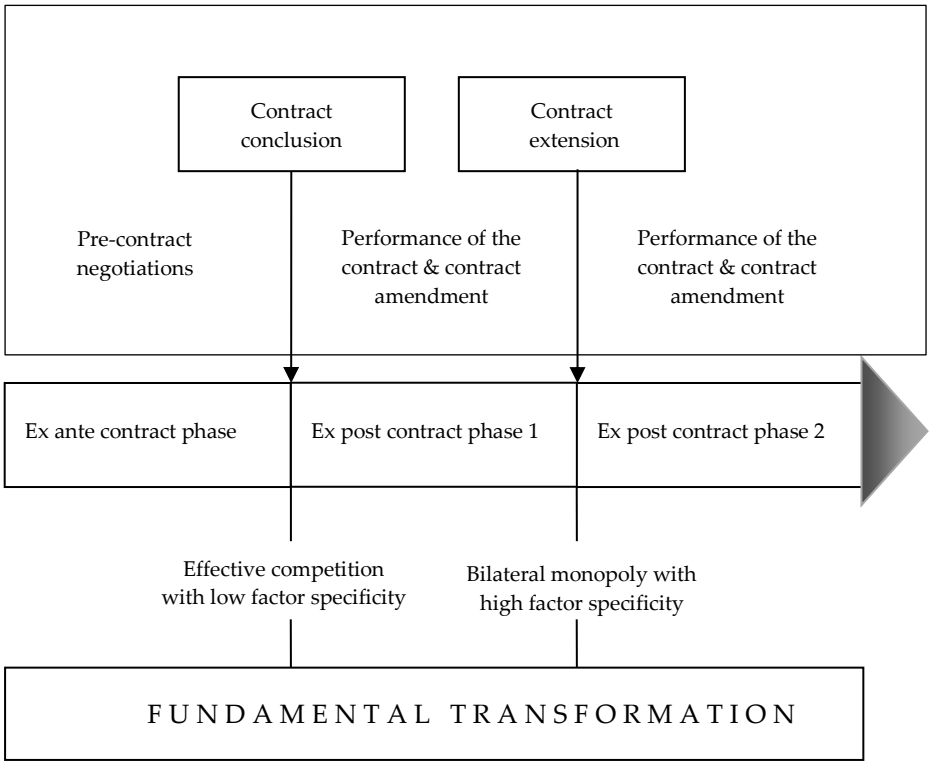
[134] Cf. Holström (1999) and Tirole (1999) for an overview about the theory of incomplete contracts.

[135] The question is here whether periodized contract partners actually tend toward opportunistic behavior (cf. Miotti and Sachwald, 2003: 1482-1483; Duschek, 2004: 54-55). Dyer and Singh (1998) state in the RV that partnerhips also represent an opportunity to achieve long term strategic CAs (cf. chapters 2 and 5).

[136] Cf. in detail about fundamental transformation: Williamson (1985, 1990: 70-72), Meyer (1995: 75-81), and Dietl (2007: 1750-1760).

FIGURE 7: Fundamental transformation



Source: adapted from Meyer (1995: 81), modified

Resources, capabilities and core competencies base their approaches on the following common aspects:

- Resources / capabilities have a firm-specific component as they are owned and controlled by the firm,
- A differentiation of resources / capabilities according to their contribution to the success of the firm is possible,
- Competitive advantage based on superior resources / capabilities.

The use of the terms resources / capabilities allows no reference to the actual success effectiveness, their potential character or their strategic importance. A potential to achieve CA arises only then, when the provided potential of resources / capabilities is activated and leads to a solution that provides the firm with an

advantage against its competitors. This strategic potential for success of activated corporate resources and capabilities leads to a sustainable CA and affects the success of a firm in a sustainable manner (Haedrich and Jenner, 1996: 16).

4.3 SUCCESS CHARACTERISTICS OF EFFECTIVE RESOURCES

The firm's own resources and capabilities, as potentials activatable by strategic decisions, are in the center of market related activities in which not all resources / capabilities contribute to success to the same extent. However, effective resources and capabilities are essential for the long term survival of a firm in competition. There are a variety of contributions in the literature that deal with the types and characteristics of resources and their potential contribution to competitive advantage. The following Tables 8a-d present some significant contributions.

Much of the literature[137] on the RBV discusses the characteristics or attributes: a) valuable, b) rare, c) inimitable, and d) non-substitutable, which resources or their combinations must meet in order to be effective for success or a source of strategic success. Accordingly, from a strategic perspective a strategic potential for success must be valuable, which means that it can put a company in a position within a given market, and provide an equivalent achievement at lower costs than the competitors, or alternately provide a superior achievement from the customer's perspective. Then, the achieved advantageous position must be defended against the competition in order to allow the owner of the advantage to survive in the competition.

[137] Cf. Barney (1991), Amit and Schoemaker (1993), Dierickx and Cool (1989), Grant (1991), Williams (1992), Peteraf (1993).

TABLE 8a: Overview of significant literature for types and characteristics of resources, part 1

Author	Category	Characteristics
Amit and Schoemaker (1993)	• Strategic industry factors (extern) • Resources • Capabilities • Strategic assets	Strategic Assets: • Non-tradable • Complementary • Scarce • Appropriable • Firm-specific • Overlap with strategic industry factors
Barney (1991)	• Physical capital • Human capital • Organizational capital	• Valuable • Rare • Imperfectly imitable - Unique historical conditions - Causally ambiguous - Socially complex • Non-substitutable
Collis (1994)	• Organizational capabilities - Functional capabilities - Dynamic capabilities - Creative capabilities	• Physical uniqueness • Path dependence - Time compression diseconomies - Asset mass economies - Interconnectedness • Causal ambiguity (socially complex) • Capacity pre-emption in committed assets • Value dependent on the context of industry and time

Source: adapted from Winterhalder (2006: 29-30); modified

TABLE 8b: Overview of significant literature contributions for types and characteristics of resources, part 2

Author	Category	Characteristics
Dierieckx and Cool (1989)	• Asset stock • Asset flow	• Non-tradable • Non-imitable - Time compression diseconomies - Asset mass efficiencies - Interconnectedness - Asset erosion - Causal ambiguity • Non-substitutable
Eisenhardt and Martin (2000)	• Dynamic capabilities (organizational or strategic processes)	• Partly generic, partly firm-specific - Equifinal - Substitutable - Fungible - Somewhat rare • Effectivity dependent on market dynamism
Grant (1991)	• Financial resources • Physical resources • Human resources • Technological resources • Reputation • Organizational resources	• Sustainability - Durability - Transparency - Transferability - Replicability • Appropriability
Henderson and Cockburn (1994)	• Component competence (specialized functional or market competence) • Architectural competence (integrative / learning competence)	• Tacit • Embedded • Firm-specific

Source: adapted from Winterhalder (2006: 29-30); modified

TABLE 8c: Overview of significant literature contributions for types and characteristics of resources, part 3

Author	Category	Characteristics
Peteraf (1993)	• Resources	• Resource heterogeneity • Ex-post limits to competition • Imperfect resource mobility • Ex-ante limits to competition
Prahalad and Hamel (1990)	• Core competence (Strategic architecture)	• Access to various markets • Contribution to customer benefit • Difficult to imitate
Reed and DeFilippi (1990)	• Competences	• Tacitness • Complexity • Specificity
Richardson (1972)	• Activities (based on) capabilities	• Similar • Complementary
Teece (1986)	• Assets	• Complementarity (generic, specialized, co-specialized) • Imitability (due to legal instruments or nature of technology) • Meeting user needs

Source: adapted from Winterhalder (2006: 29-30); modified

TABLE 8d: Overview of significant literature contributions for types and characteristics of resources, part 4

Author	Category	Characteristics
Teece, Pisano and Shuen (1997)	• Positions (technological, complementary, financial, reputational, structural, institutional, market structure, organizational boundaries) • Processes (coordination, learning, reconfiguration)	• Firm-specific / unique • Honed to user need • Inimitability (by competitors) • Non-substitutability • Replicability (within the firm)
Wernerfeldt (1984)	• Assets / Resources	• Assets tied semi-permanently to the firm • Tangible / Intangible • Related complementary / supplementary • Bargaining power of suppliers • Bargaining power of buyers • Availability of substitute resources • Resource position barriers • Usability in several product markets

Source: adapted from Winterhalder (2006: 29-30); modified

However, if the competition has access to the same strategic potential for success, or completion can be achieved without major investments, the competition might be tempted to follow the same competitive strategies and try to compensate for the advantageous position of the original owner to eliminate his unique selling proposition. Therefore, a limited or unavailable strategic potential for success secures the disadvantageous position of the competition, and ensures the survival of the owner of the advantage.

Faced with this, the competition could try to establish the strategic success potentials themselves or try to imitate them. This means that strategic potential for success which is inimitable or difficult to imitate acts to a detriment to the imitator and can benefit the current owner by consolidating the advantageous position. If the competition, by using the same strategic potential for success, is

not able to compensate for its disadvantage, it can try to use other resources and capabilities as substitutes. Therefore, strategic potential for success should be non- or only limited substitutability.

To build and to defend a CA it is not enough to just consider the strategic potential for success in terms of their effect on current or future markets. Therefore, the owner of the advantageous position must ensure that the competition is not able to obtain or to use the same or similar strategic potential or its substitutes. Not the strategic potential for success, but its use leads to CAs (Haedrich and Jenner, 1996: 16), so that Hinterhuber (1996: 126-127) argues to focus on factors (success factors) which directly affect the firm´s success in competition. The number of these success factors is limited (Wolfrum, 1993: 114) and the effectiveness is determined by the prevailing market situation, so that in different branches of industries, different success factors may be relevant (de Vasconcellos, Sousa, and Hambrick, 1989: 368). Therefore, Headrich and Jenner (1996: 15) state: „Unternehmen werden (…) erfolgreich sein, wenn sie, bezogen auf die zentralen Erfolgsfaktoren in ihrer Branche, Wettbewerbsvorteile erringen können.“[138] Headrich and Tomczak (1996: 66) state: „Ein Unternehmen ist dann effizient, wenn es ihm gelingt, die Erfolgspotentiale zu identifizieren und zu entwickeln, mit denen strategische Erfolgsfaktoren aufgebaut werden können (…). Ist das Unternehmen dazu in der Lage, diese strategischen Erfolgspotentiale in strategische Erfolgsfaktoren umzusetzen, dann ist es außerdem effizient (…) - das macht sich z.B. in dem Gewinn von Marktanteilen, in einer Umsatzsteigerung und positiven Deckungsbeiträgen bemerkbar.“[139]

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[138] Translation from GER according to Haedrich and Jenner (1996: 66): "Firms are (...) successful if they are able to achieve a CA based on the key success factors in their industry."

[139] Translation from GER according to Haedrich and Tomczak (1996: 66): "A firm is efficient if it is able to identify and to develop those strategic success factors that can establish (...) the potential for success. If the firm is able to translate these strategic success potentials into strategic success factors, the firm is also efficient (...) - which is, e.g. perceptible in gaining market share, in an increase in sales and positive profit margins."

Therefore, firms are competing for success factors that are situation- and industry-specific and crucial for their success in the market. Building these factors will be enabled by firms' strategic potential for success. This can lead to a unique control of a success factor, which the firm then occupies as a strategic success factor and with which it achieves an advantageous position in competition which affects its success in the market (Haedrich and Tomczak, 1996: 65).

4.3.1 Strategic value

A resource[140] is considered as strategically valuable when it allowes a firm to take advantage of opportunities (Barney, 1991: 105), to take advantage of opportunities for success or to neutralize threats from the environment of the firm (Barney, 1992: 42). Such resources which keep the market risks away indeed have strategic relevance for a firm's survival in the market, but are not always the basis of a competitive advantage (Corbett and van Wasserhove, 1993: 113). For example, a manufacturer of normed machine components can only sell parts that have been manufactured in accordance with the relevant standard, as it is established as a standard in the market. However, if the manufacturer produces outside the standards and thus not according to the norm, the finished parts are not for sale in the market and he suffers a competitive disadvantage. Conversely, this means that producing under an established standard only ensures the possibility of the manufacturer to participate in the market, but no competitive advantage that differentiates from the competition.

Furthermore, resources can be tradable on a market (Grant, 1991: 123; Schoemaker, 1990: 1179) and are the source of economic rents for the firms that use them. This means that the profit drawn by the firm from the use of the resource must be higher than the expenses incurred in order to obtain control over the use of the resource.[141] On perfect markets with complete mobile resources, it cannot come to the creation of economic rents because all market

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[140] Prahalad and Hamel (1990) and Hamel and Prahalad (1995) also subsume capabilities and competences under the term resource, which will be applied by the author in the dissertation as well.

[141] Cf. in detail chapter 2.

participants have equal access to the resources, so that the resources lose their valence.

This means that for the emergence of economic rents there must be market failure in the neoclassical sense, but at least the expectations of the market participants about the achievable profits from the use of resources must differ (Zimmer, 1999: 110). Mahoney and Pandian (1992: 365) state that "Differences among firms in terms of information, luck and/or capabilities enable the firm to generate rents". Dierickx and Cool (1989) state that markets on which resources are traded are typically non-perfect and often incomplete. Intangible resources, such as a firm's reputation for the quality of its products or for its innovativeness, but especially the trust of customers, cannot be traded on a market. Generic working capacity tradable on the market will also be meaningful and valuable, and possibly non-replacable, if it is acquired with firm-specific knowledge and experience that employees acquire in the course of their work in the firm or complete during their working lives (Penrose, 1955; 1959; Williamson, 1979: 255-256).

However, combining the individual skills of employees and thus forming a team with team-specific routines (Nelson and Winter, 1982) and standard-operating procedures (Cyert and March, 1963: 101-102) makes the issue of non-tradability even more obvious, as these resources cannot or not easily be purchased and are the result of long-lasting and often only limited controllable processes. Barney (1989: 1512-1513) argued that for the creation of intangible resources in general investments are necessary in the market for strategically relevant resources, which are also associated with opportunity costs. But a perfect market for strategic factors would mean that none of the market participants could benefit from the development or the investment in intangible resources, since the expended funds would be equal to the related revenues.

In contrast to that, and due to the fact that some firms estimate the expectation for potential profit by intangible resources more realistially than other firms, or because resources turn out to be more strategically valuable than originally anticipated, above normal revenues are possible (Zimmer, 1999: 111).

4.3.2 Rareness

In order to draw a competitive advantage from the use of a resource, that resource must not be available to competitors. The availability of the resource must be limited, so it must rare, better yet it must be unique. This rareness or uniqueness can lead to a unique advantage for its users, which in turn can lead to an advantageous position in the competition and a differentiation from other market participants. Therefore, the extent of this competitive advantage is *inter alia* determined by the rareness of a resource (Barney, 1991: 106; Amit and Schoemaker, 1993: 39).

Peteraf (1993: 182) argues that possible sources for the rareness of the deployment and the associated generation of values are the imperfection of the market for resources and the outputs for which the resources are to be used. The rareness of valuable resources can also lead to different rents:

- Ricardian rent[142]: Natural scarcity due to rare use of valuable resources.
- Schumpeter rent[143]: Rare use of valuable resources due to their novelty, as they generate values in a new way (Amit and Zott, 2001 p. 508). The novelty is degraded over time, which leads to a decrease of the potential to extract rents by the resource.
- Monopolistic rent: The amount of output for which the resource is used is deliberately limited to a threshold, which enables higher prices and higher rents. The causes may lie in a limitation of the sales market by governments or own regulations, which do not allow the use of resources by additional competitors (Conner, 1991: 134).

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[142] Named after David Ricardo (English economist, 1772-1823) who wrote "On the Principles of Political Economy and Taxation", dealing with comparative cost advantage in international trade on the basis of productivity differentials in 1817.

[143] Named after Joseph Alois Schumpeter (Austrian-American economist, 1883-1950).

- Pareto rent[144]: Valuable resources can in a particular application generate a higher value for the user than in an alternative use for other users (Klein, Crawford and Alchian, 1986: 41; Peteraf, 1983: 184).

However, if the resource would also be available to competitors, then the achievement of an advantageous position due to the appropriate use of this resource would be nearly impossible, because of the equal opportunities for all competitors having access to this resource (Barney, 1992: 43). Schreyögg (1992: 207) argues additionally: „Wo alle dieselbe Strategie verfolgen, wird aus einer Erfolgsstrategie zwangsläufig eine Mißerfolgsstrategie (jedenfalls für die meisten Beteiligten).“[145] Therefore, the rareness of strategic success potentials can be evaluated on hand of their ownership, or also on the possibility to purchase them (Barney, 1991: 107).

Owning a rare resource alone is not sufficient to justify a position of advantage, as with that ownership a firm only has the potential to create a advantageous position, but this must be implemented by appropriate decisions (Collis, 1991: 51). Should, for example, long term commitments to strategic decisions exist that complicate the use of the rare resource or make it impossible, then the utilization of the resource is limited, and its strategic potential for success cannot be implemented to gain an advantageous position in competition with other firms (Collis, 1991: 51).

Chi (1994: 271-273) discusses various ways available to competitors in order to have access to strategic potential for success. If current ownership of the potential is excluded, there is a possibility to compensate for this situation via a corporate acquisition. There would also be a possibility to buy strategic

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[144] Named after Vilfredo Pareto (Italian economist, 1848-1923).

[145] Translation from GER according to Schreyögg (1992: 207): “When everyone follows the same strategy, a successful strategy will become a non-successful strategy (at least for the most of the participants)”.

potential for success as a service (e.g. management consultancy, personnel leasing, etc.) or to enter into cooperation with that firm that owns the desired strategic potential. The integration into respective corporate networks is also feasible, and has the advantage of receiving access to the strategic potential for success of other firms without the need to acquire these resources oneself (e.g. a firm compensates product gaps with competitors' products).

These options may preclude the strategic decision of a firm with the appropriate strategic resources to deny the available opportunity to the competitor and to protect their own advantageous position by maintaining the rareness of the resource. This position could possibly be abandoned, if the firm has knowledge about changes in the assessment or evaluation of the rareness of the resource. For example, the owner of the advantageous position may already have access to the successive resource. With technological change, for example, it may be useful to facilitate controlled access to the competition to the old resource in order to close its technology gap. This could prepare the market for the introduction of one's own technology jump by closing the technology gap of the competition and keep the competitors away from closing their technology gap by other means (e.g. by a substituting competitive technology).

4.3.3 Immobility

In order to secure the advantageous position of a firm in competition, it is necessary that certain strategically relevant resources are immobile and so the heterogeneity of firms can remain in competition. A concentration on tangible resources to secure an advantageous position cannot prevent competitors purchasing or acquiring such tangible resources and can compensate a competitive disadvantage (Zimmer, 1999: 112).

Therefore, tangible resources are available to any competitor who arrives

at the conclusion that the strategic value of the resource is greater than its acquisition and maintenance costs. However, if the owner of the advantageous position has made a smaller effort to acquire and maintain a strategic resource than the interested competitors, it might be impossible to generate a CA. This can be explained by the different timing approaches of the initial investor (time t_0) and the successor (time t_1) (Lieberman and Montgomery, 1988: 1233-1234). At time t_1 the successor has a late approach, and has to realize the expenses at the real-time value of the strategic resource, which may lead to the fact that the successor, compared to the expenditure incurred for the acquisition of the strategic resource by the initial investor at the time t_0, suffers competitive disadvantages (real value t_0 < real value t_1). This may affect all tangible resources that promise the competition the greatest possible success (e.g. production sites, sales channels, etc.).

Barney (1986a: 656-657) argues that the CAs of the initial investor are based on unequally distributed knowledge about the necessity and the potential of the resource, and at a possible tie of knowledge (equalized), only fortunate circumstances may be responsible for achieving a advantageous position. Zimmer (1999: 112-113) completes: „Schließt man glückliche Fügungen als prinzipiell nicht steuerbaren Faktor aus, so basieren Wettbewerbsvorteile auf einer schlecht handelbaren, ungleich verteilten Ressource, nämlich dem Wissen (um das Erfolgspotential einer Ressource) des first movers.“[146]

According to Barney (1991: 105) the existence of such mobility barriers is based on the heterogeneous distribution of resources, and that some resources

[146] Translation from GER according to Zimmer (1999: 112-113): "If lucky coincidences are excluded as basically uncontrollable factors, competitive advantages are based on a badly tradable, unequally distributed resource, namely the knowledge (about the success potential of a resource) of the first mover."

are immobile, with the result that a potential competitor either does not have access to them or - in other extreme - can get easy access to the resources and overcome the mobility barriers.

4.3.4 Non-imitability

In order to protect a CA over a current or potential competitor the scarcity of a resource or its limited availability is not enough. If a potential competitor has no options to get access to the strategic resource, he can try to build or to imitate it in his own firm (Dierickx and Cool, 1989: 1507). Whether an advantageous position of a firm is permanent or not also depends on the resources of the competitors to compensate this position, by trying to imitate this strategic resource within the firm. The easier this can be achieved, the riskier is the CA of the firm that owns the advantageous position (Amit and Schoemaker, 1993: 39; Williams, 1992: 32).

The mere imitation of a strategic resource is possibly not sufficient to compensate an advantageous position of a firm by its competitors, as the experience and learning curve (e.g. the development of organizational and technological capabilities and routines) that a firm has developed over time and on the basis of the entrepreneurial decisions that led to the establishment and use of the resource, thereby justifying the advantageous position, cannot be easily imitated (Barney, 1991: 107-108; Zimmer, 1999: 113-114; Nelson, 1991: 69-70). To build these strategic resources in an accelerated way may only be possible by time compression diseconomies, e.g. increased expenses by shortening the build-up time (Dierickx and Cool, 1989: 1507).

This is reinforced by the consideration that less successful competitors will incur sunk costs, which, in combination with their own view of the firm and its environment and an anchor in the organizational routines, complicate a strategic change of direction or an adaptation to changing environmental

conditions (Ghemawat, 1986: 57; Zimmer, 1999: 114-115). Therefore, it is useful for the owners of an advantageous position to protect themselves against imitation of its strategic resources by competitors. This could be achieved by decisions to establish strategic resources as discreetly as possible, which are not visible or traceable by the competition, making them difficult to imitate and to compensate the advantageous position.

Another difficulty in the imitation of strategically relevant resources occurs when the owner of the advantage does not owe this position due to single, but a combination of resources and these are responsible in their combination for the CA of the firm. Because of their social complexity (Dierickx and Cool, 1989: 1508; Barney, 1991: 110-111), such a combination of strategically relevant resources (e.g. technical production processes in conjunction with the skills of employees, etc.) and in conjunction with organizational routines can be difficult to imitate (Zimmer, 1999: 115-116). If components of this combination of resources are not visible or not observable (e.g. tacit knowledge, organizational routines) for the competition, a special protection against imitation is given, because the higher the proportion, the stronger the protection against imitation (Godfrey and Hill, 1995: 523). Barney (1991: 110) mentions relations, corporate culture or corporate tradition as possible reasons that some firms are able to use certain other hard resources (e.g. technology, etc.) more effectively or efficiently than other firms.

Also, the lack of knowledge about causal relationships and interactions of resources and their combinations may result in an imitation being almost impossible, because the resources were not or cannot be observed at the occurrence of the advantage (Reed and DeFillippi, 1990: 91). If the firm owning the advantageous position knows the causal relationship, and the competition does not, it can influence its protection against imitation. However, the situation is critical when neither the firm in the advantageous position nor the competition are clear about what causal interactions justify the position,

because then neither safeguards against imitation can be made nor can a more sustainable preservation of the advantageous position be guaranteed (Peteraf, 1993: 187). A change in behavior, based on changes in the environment, may cause the holder of the advantageous position to lose it, due to the disoriented situation.

If the advantageous position is based on investments in idiosyncratic (specific or special) goods and investments, the focus in this asset specificity[147] can be another obstacle to the imitation of strategically relevant resources (zu Knyphausen, 1993: 777).

A possible example of this is the selection of the appropriate electronic control systems and components in a material handling system (e.g. like in a BHS) of an airport. If the customer has once specified a system as part of the tendering procedure, the customer may face difficulties or is restricted to use control systems or components from other manufacturers if he wants to extend or renew the system at a later stage, if the airport does not want to face interface or compatibility problems and thus to risk an interruption of the system's handling and processing.

Therefore, the commitment to a transaction partner leads to a lock-in-relationship of the airport. To solve that would inevitably lead to sunk costs for the airport as a transaction partner. Zimmer (1999: 118) argues that idiosyncratic goods can be used as resources in the RBV for the following transaction relationships: (a) for relationships between firms and their

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[147] The term asset specificity originates from the transaction cost theory (Williamson, 1979) and describes that the parties make a transaction-specific investment in order to reduce the transaction costs, which however is barely available for any other alternative use. These constitute sunk costs for investors, and therefore the customer is "Effectively 'locked into', the transaction to a certain degree" (Williamson, 1979: 240); (Zimmer, 1999: 118).

supplies, (b) for relations between firms and their employees and (c) for relationships between firms and their customers.

Related to case (a) Zimmer (1999: 118) describes that this particularly applies if certain goals must be secured. These may be special coordination mechanisms, specific quality standards or low costs, etc. Zimmer (1999: 118) argues with reference to (Williamson, 1979: 255-257) that case (b) is given, if the employees have acquired, for example, special implicit knowledge and specialized skills, or have a positive influence on the characteristics of the product, the price or the innovative capacity of the firm. In case (c) relations between the firm and its customers are in the center of consideration, which is when corresponding advantages arise from the definition of a transaction partner. There, for example, brand loyalty, manufacturer reputation and trust play a role. Trust, for example, is a strategic intangible resource whose generation requires time, but the investment of which does not always automatically lead to a positive feedback response of the transaction partner, and is therefore connected to a unilateral risk. Once an advantageous position in the form of a trust-based relationship is established, its imitation can be considered as virtually impossible or only to be realized at substantially higher cost.

4.3.5 Limited substitutability

If strategically relevant resources are neither available nor imitable for a competitor who wants to compensate the advantageous position of another firm, the competitor can try to achieve the same success by other strategically relevant success potentials (Collis, 1994: 147). Should the competitor be able to achieve similar results as the owner of the advantageous position by means of substitution of strategically relevant resources, the advantageous position of the owner will only be temporary and eliminated as soon as the substitutes are used (Barney, 1991: 111-112).

Therefore, it is not sufficient to limit the protection of strategically relevant resources to their value, their rarity, their immobility and their non-imitability. This can be illustrated with an example: A firm creates a cost advantage by means of a competitive superior manufacturing technology, which it passes on to its customers in the form of reduced prices. A competitor who shifts his production to a low-cost country could mean that this competitor passes on his cost savings as a reduced price to customers. In this case, the competitor could substitute the resource of superior manufacturing technology of the owner of the advantageous position by the lower-cost resource (e.g. lower wages) and achieve the same success (e.g. reduced price) as the previous owner of the advantageous position. In this case, the control and the use of other resources led to the achievement of at least strategic equivalence from the use of substitutes for the competitors.

On the other hand a competitor can try to develop substitutes to the resources that enable the owner of an advantageous position to exercise a particular strategy. He could, for example, specifically try to imitate relevant teams of the owner of the advantageous position by building similar teams. However, these imitations may differ from the original due possibly other experiences, other capabilities, different speed of action, etc. and may arrive at similar results as the original. When this situation occurs, the positive imitation constitutes an equivalent substitute that enables the competitor to compensate the CA of the established firm.

Effective protection against this situation can be achieved by limiting the substitution alternatives and by ensuring that the success can only be attained by the firm's own strategic potential for success. However, if the established owner of the advantageous position is faced with the situation that the CA determining success factor may be compensated by substitutes, he may

consider a time-limited protection[148] against the loss of the advantageous position. This could imply that the strategic potential for success is only available to a limited extent, or needs to be built up by the competition (e.g. protection by patents, utility models, law, commercial law restrictions, etc.).

Firms that have a strong focus on certain corporate strategic resources can tend not to recognize certain potential chances, due to the fact that their development is focused on firm-internal potential opportunities by perceptual distorsion (Zimmer, 1999: 120). This limited rationality in combination with an established corporate internal dominant logic leads to a reduction of a possible substitution of strategically relevant resources for these firms (Zimmer, 1999: 120; Simon, 1955; Bettis and Prahalad, 1995).

4.4 RESOURCE CHARACTERISTICS AND SUSTAINABLE COMPETITIVE SUCCESS

The RBV focuses on the heterogeneous distribution of resources as well as on their control and use in order to achieve CAs between firms. Due to the heterogeneous distribution of resources, not all firms have equal access to strategically relevant resources, whose use would enable them to generate economic rents. The characteristics mentioned that strategically relevant resources must meet (rare, immobile, nonimitable, non-substitutable) constitute a strategically relevant resource, depending on their severity, and may have different impact on achieving sustainable competitive success.

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[148] Patents and utility models are only suitable as sustainable protective measure in the short term or conditionally, because they are freely accessible after a certain time, and the patent documents can represent a possible source of transfer of resources (Ghemawat, 1986: 56).

Table 9 presents the different effects of the characteristics of strategically relevant resources on the competitive success of a firm.

TABLE 9: Characteristics of resources and their implications on success in competition

Is a resource...				**results for competition**
strategically valuable	rare	difficult to imitate	without substitutes	
No	-	-	-	Disadvantage
Yes	No	-	-	Parity
Yes	Yes	No	-	Temporary advantage
Yes	Yes	Yes	No	Parity
Yes	Yes	Yes	Yes	Sustainable advantage

Source: adapted from Barney (1992: 43)

To build a CA based on resources that are not valuable leads to a competitive disadvantage for a firm, as these resources bear no strategic potential for success in itself. Parity is achieved if the resource, although strategically valuable for the firm, is not rare. Therefore, other competitors also have the possibility to secure the availability of the resource, possibly at low prices. A firm can achieve a temporary CA, if it justifies the establishment of a CA on valuable and rare resources. However, if the firm imitates a resource that complements the just-mentioned characteristics, the firm can establish parity to the competition. If the resources have the additional characteristic of being non-substitutable, then it will lead to a sustainable CA. That means that if all characteristics are met, it can be assumed that the desired sustainability of a CA is achieved.

The development of a sustainable CA from strategically valuable resources which consist of soft goods (e.g. intangible assets, like trust), help the owner of a advantageous position to defend that position as long as possible from the competition. It can include special knowledge, a special organizational culture, organizational routines, informal networks, etc., that is usually tied to people or organizations specifically (Hall, 1991: 44-45).

An established firm can achieve sustainable protection of its position, and therefore a sustainable economic potential to achieve a rent, by focusing on the structural design of CAs by intangible strategically relevant resources. The resources are those that by their social complexity, their reference to the path dependency and the fact that they are often neither visible nor tangible, provide a better protection for the firm than tangible resources (zu Knyphausen, 1995: 95).

4.5 COMPARISON BETWEEN RBV, NEOCLASSIC, AND TRANSACTION COST THEORY

After the previously made delimitation of the RBV from MBV[149] a consideration of the similarities and differences between the neoclassical and the transaction cost theory is necessary in order to present a complete picture and to analyze the meaning of the RBV.[150]

The neoclassics combine production factors, labor, and capital under the assumption of perfect competition (Seth and Thomas, 1994: 169). Strategically valuable resources are equally accessible for all market players, so that all companies on the market have the same access. External market conditions determine the success of entrepreneurial activities (Hunt and Morgan, 1995: 2-3; Nelson, 1991: 64). The consequences of perfect competition are contrary to the assumptions of the RBV, where market conditions may affect the entrepreneurial activities and their success, important strategic potential for success (due to imperfect / incomplete factor markets) are immobile and their identification and use is crucial for the generation of rents (Connor, 1991: 133).

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[149] Cf. Subchapter 4.1.

[150] This dissertation cannot discuss the mentioned approaches in detail. For more details see also Coase (1937) and Schumpeter (1964; 1965).

So it could be concluded that strategic decisions that in turn take the behavior of the players in the market into account are necessary. The effect of the strategic potential for success in the market is determined by the products and services that are subjectively perceived and evaluated by the customer (Wernerfelt, 1984: 171).

The RBV "highlights the importance of key resources in achieving a competitive advantage" (Hooley et al., 2001: 503) and has the focus on the internal resources of a firm and their combination to assess strategic potential for success and its effect on the market (Schindler, 2015: 169), which has the goal to provide a consistent customer and competitive orientation to generate CAs on the basis of specific profiles of strengths and weaknesses (Haedrich and Tomczak, 1990: 20) and provides the firm with opportunities to influence the formation of the market (Müller-Stewens and Lechner, 2001: 276). This means that companies can themselves be responsible for the design and control of the potential for success in the market. The strengths of the company are then used with the appropriate protection as their strategic potential for success.

The transaction cost theory is described by Williamson (1996: 135-136) as a "(…) predictive theory of economic organizations in which a large number of apparently dissimilar phenomena are shown to be variations on a few key transaction cost economizing themes". The transaction cost theory considers firms from the contract theory perspective. For each transaction implicit / explicit contracts are needed; the associated costs for the design (preparation), negotiation and securing of contracts are called transaction costs (Williamson, 1990: 22-23). Conner (1991: 131) argues that firms only grow as long as the cost of an internal transaction (within the firm) is equal to the cost of an external transaction (in the market). Williamson (1990: 49-50) argues that the problem of identification of constellations consisting minimal transaction costs can be difficult due to the attempted rationality, opportunistic behavior,[151] and limited characteristics of decision-makers.

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[151] Williamson (1990: 54) refers to opportunistic behavior „(…) die unvollständige oder verzerrte Weitergabe von Informationen, insbesondere auf vorsätzliche Versuche irrezuführen, zu verzerren, verbergen, verschleiern oder sonstwie zu verwirren." Translation from GER according to Williamson (1990:

This means that transactions can ex-ante not be fully anticipated and therefore concluded contracts remain incomplete from the transaction cost side. The factor specificity, uncertainty and frequency of the transaction is determined by whether an internal or external transaction is attempted. Decisions to achieve a trade-off, which has its source in the factor specificity, are made under conditions of uncertainty, which is caused by opportunistic behavior that may be problematic especially in transaction-specific investments and suggests the installation of monitoring systems. The related costs fall with increasing utilization, so that the frequency of the transaction has to be considered (Williamson, 1990: 68-67). Firms attempt to minimize transaction costs minimizing, if there is significant factor specificity and risks from opportunistic behavior (Williamson, 1996: 139). Connor (1991: 133) argues that the approaches of the RBV and the transaction cost theory have common assumptions, which are (a) bounded rationality, (b) possible presence of opportunistic behavior and (c) impact of asset specificity.

Contrary to the position of the RBV, in which the firm combines strategic resources for achieving success, the transaction cost theory considers firms as possibilities to control opportunistic behavior (Ghoshal and Moran, 1996: 14). Ghoshal and Moran (1996: 58) argue additionally that "(...) markets and firms are very different kinds of institutions, with very differential logics, to be effective, each must implement its own logic and not the others." The transaction cost theory plays an important role in explaining the existence of firms (Ghoshal and Moran, 1996: 40); recommendations to firms for achieving stable CAs in the market should be derived from the RBV (Foss, 1996: 471).

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54): "(...) the incomplete or distorted dissemination of information, particularly on deliberate attempts to mislead, hide, conceal or otherwise confuse".

4.6 CRITICAL ASPECTS AND FURTHER DEVELOPMENT

In anticipation of the intermediate result in chapter 6 of this dissertation, it needs to be already addressed at this point that the traditional RBV, due to the failure to take account of market trends is not without criticism (Eisenhardt and Martin, 2000: 1106) and therefore has been extended to consider dynamic markets. The reason given is that the previously discussed RBV neither considered how nor why certain firms achieve a CA in rapidly changing and unpredictable markets (Eisenhardt and Martin, 2000: 1106). Heterogeneous distribution of resources cannot be the sole explanation for CAs of firms (Zimmer, 1999: 128; Collis, 1994: 150.). In markets where the competitive environment is changing, the dynamic capabilities of the firm itself must be transformed into a CA, so that market changes can be taken into account (Teece et al., 1997: 516).

This isolated view on the resources of a firm as a reason for the development of rents and the neglect of opportunistic behavior by the actors are part of the weakness of the RBV. Although the combination of resources and the development of relations for the generated values will be considered, it does not satisfactorily explain how to develop strategically valuable resources to generate sustainable rents, because the RBV only considers the enterprise as the object of contemplation[152] (Müller-Stewens and Lechner, 2001: 278-279).

Related to the topic of this dissertation, Schindler (2015: 172) argues that another important weakness of the RBV is that the approach does not explain how to generate CAs and economic rents under conditions of product homogeneity. This means that there is no sufficient discussion about bundling of resources and relationships and / or cooperations to achieve CAs and to generate rents.[153] But exactly the combinations of resources and complementary relationships between the actors in a market are crucial to achieve CAs and supernormal rents. This has highest importance in industries where firms offer

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[152] Teece et al. (1997) also use the firm as analysis unit in the dynamic capabilities approach.

[153] The RBV is useful to analyze ex-post reasons for generating success, but the approach does not deliver the arguments for generating success.

homogeneous products[154] or products which are close to being homogeneous (quasi homogeneous). If these firms need to source the production factors (e.g. tangible assets) on the factor markets for a certain price level, with probably geographically limited access, the firms will become more or less homogeneous and unable to create a CA due to the fact that they do not share their resources. In the case where a firm uses its internal resources better than others and generates an economic rent, the output to the customer is a product that does not significantly differ from products of competitors, i.e. the products are more or less homogeneous. If a firm generates rents, which result from the efficient combination of internal resources, it can be assumed that the value of the achieved economic rent will be used to craft a CA by a decrease in the price of the product. This could lead to a downwards oriented price development for offered homogeneous products, where less efficient firms will reach break-even earlier than better performing firms and so possibly leave the market (Schindler, 2015: 172). Schindler (2015: 172) argues that a possible way to leave this downward spiral that results in decreasing rents may be to focus on intangible resources, their combination and sharing in relationship networks (or cooperations) among firms, where the customer can be integrated as well (e.g. through CI).

Strategic recommendations for generating above-average corporate success based on the RBV are directed on the one hand at the design and sustainable exploitation of resources in the context of resource management, and on the other hand at the dynamic and especially future-oriented development of the resources. The application of RBV on different problems in strategic management makes it clear that in order to explain above-average profits, a unilateral orientation on the market conditions or on the resources of a firm is not enough. Rather, a combination of market and business-oriented perspectives enables better planning support for an application in practice (zu Knyphausen, 1993: 786). Therefore, this connection creates space for the development of other approaches as well as the further development of the RBV.

As a result of the above-mentioned assumptions it can be highlighted that the RBV is probably not sufficient to answer the question of this dissertation on how to generate CA under specific conditions of the airport baggage handling

[154] This means a physical product as a tangible asset.

industry. This opens the way to apply an approach that takes both into account: the interactions of the relationships of various actors and the goal oriented combination of their resources. This approach is the relational view (RV) which will be discussed in the following chapter.

5 RELATIONAL VIEW

5.1 DEMARCATION TOWARD MBV AND RBV

Previously this dissertation discussed two prominent views to explain the sources of CAs and super normal returns from the perspective of its topic.

First, the MBV with its outside-in perspective considers the view on the structure of an industry as the source for supernormal returns. Duschek (2004: 56) states that the "(…) market-based form of purchasing resources, in particular, does not play any significant role in establishing imperfectly mobile factors in resource-based approaches, as only a transfer of non-specific (tradable or more or less perfectly mobile) resources is possible on account of governance and incentive mechanisms mentioned here."

Second, the RBV argues that the heterogeneity of firms and their different performance is relevant for achieving supernormal returns, and states that firms are able to use resources and capabilities (e.g. invisible assets[155]) with certain characteristics would be able to achieve CA over their competitors (Barney, 1991; Rumelt, 1984; Derickx and Cool, 1989, Wernerfelt, 1984). Foss (1999: 2) states that "the resource-based perspective is solely occupied with analysis of the individual firm´s bundle of resources (in terms of their ability to contribute to competitive advantage), and has next to nothing to say about inter-firm-relations". The effects described by Gulati (1999) as `network resources´ are, according to Hoopes et al. (2003: 892) also outside the RBV.

Both approaches do not consider that the position of a firm in competition, and its competition-related advantages and disadvantages, were influenced by its

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[155] Itami and Roehl (1991: 12) note about invisible assets: "Consumer trust, brand image, control of distribution, corporate culture, and management skill are all informational resources. I call these information-based resources invisible assets, and they are just as essential for effective operation as the more visible corporate resources. More than that, I believe they are the most important resources for long term success".

integration into a network of relationships and its advantages and disadvantages (Dyer and Singh, 1998: 660). Badaracco, 1991: 100) argues that "In essence, the capability-sharing, capability-creating relationship between companies requires something other than traditional market transactions". Imperfect factor markets are responsible for the possibility to acquire strategically relevant resources almost exclusively via firm-internal learning processes and with the help by inter-organizational relations (Hamel, 1991: 99; Ireland et al, 2002: 430-431; Duschek, 2004: 56; Gulati et al., 2000; McEvily and Zaheer, 1999: 1152). Leonard-Barton (1995: 135) notes that only a "very few, if any, companies can build core capabilities without importing some knowledge from beyond their boundaries".

Both the MBV and RBV ignore that above normal CAs often heavily depend on corporate relations and therefore are often embedded in a network of two or more firms (Dyer and Singh, 1998; Duschek 2004: 61). This is especially evident in baggage handling projects, because the more complex these projects are and the higher the volume of orders, the sooner the system providers, where applicable, combine an overall system with achievement contributions of specialized manufacturers, divide technical, logistical and financial risks, and usually use a relationship network of industry-specific suppliers of system components.

Duschek (2004: 56) states "(…) to overcome this problem and acquire such critical resources, cooperative arrangements are seen as the only alternative mode of acquisition of non-tradable resources from the resource-based perspective" and continues: "Overall, this means that strictly speaking the genuine potential of inter-firm relations to create and sustain long-lasting resource-based advantage cannot be integrated into the RBV" (Duschek, 2004: 57-58).

The RV instead, "(…) could be seen as a ‚complementary extension of the resource- and competence-based approach (…)"[156] (Duschek, 2004: 61), which has developed into the "third leg in strategic theory" (Contractor et al., 2002: 493). The RV merges both approaches with the transaction cost theory[157] and relies on ideas

[156] See also Prahalad and Hamel (1990), Barney (1991), Teece et al. (1997).

[157] See also Klein et al. (1978) and Williamson (1985; 1991).

for the social network perspective[158] (Duschek 2004: 62). The RV can provide a valuable basis for understanding the sources of inter-organizational CAs (Oliver, 1990). The RV does not consider the individual firm as an analysis unit, but the inter-organizational relationship between two or more firms places their network relationship[159] in the focus (Duschek and Sydow, 2002: 426; Duschek, 2002: 257; Gulati, 1998) and aims to explain performance differences between business collaborations (Dyer and Singh, 1998: 661; Oliver, 1997: 707; Duschek, 2002: 264).

Thus, the RV is focused on an explanation of the firm's success based on the coupling of inter-organizational resources, capabilities and competence "(...) aiming at a conceptual anchoring of sustained competitive advantage in network resources" where the relationships of a firm have influence on its possibilities to exercise actions (Duschek, 2004: 61). Some relevant literature contributions to the RV in the relationship are:[160]

Dyer and Singh (1998: 661) argue that the use of collective resources and a cooperative approach may enable firms to achieve a CA over others in the branch firms active in the industry and state that "(...) idiosyncratic inter-firm linkages may be a source of relational rents and competitive advantage" (Dyer and Singh, 1998: 661). Dyer and Singh (1998: 662) define a relational rent "(...) as a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partner".

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[158] See also Granovetter (1985), Burt (1987; 1992), Coleman (1990), Contractor et al. (2002), Gulati et al. (2000). The RV does not apply the social network theory on a systematic basis (Duschek, 2004: 62).

[159] Gulati (1998) expanded dyadic corporate relationships to network relationships in a study of several firms and focused on strategic groups as analysis unit.

[160] Cf. Subchapter 4.1 (Tab. 7a-c) and Subchapter 4.3 (Tab. 8a-b). Relevant literature contributions based on the RBV, so that the RBV can be understood as the basis for the considerations to the RV.

TABLE 10a: Relevant research contributions to the RV, part 1

Author	Topic	Focus on
Dyer (1996a; 1996b)	Networks as basis of CA	Specialized on networks between suppliers as the basis for the achievement of CAs.
Dyer (1997)	Collaboration between firms	Efficiency in collaboration between firms; minimization of transaction costs; maximization of transaction value.
Dyer and Singh (1998)	Relational view	Relationship between firms important as important unit of analysis for CA; identification of potential sources of inter-organizational CA.
Kale,Singh and Perlmutter (2000)	Building relational capital	Learning know-how and capabilities from alliance partner, self-protection related to opportunistic behavior of alliance partner in networks by building relational assets based on trust and interaction.
Gulati,Nohria and Zaheer (2000)	Strategic networks	The networks of relationships where firms are embedded influence their conduct and their performance; identification of five key areas with potential for strategic networks: industry structure, positioning within the industry, non-imitable resources and capabilities of a firm, costs for contracting and coordination, constraints and benefits of dynamic networks.

TABLE 10b: Relevant research contributions to the RV, part 2

Author	Topic	Focus on
Kale, Dyer and Singh (2002)	Long term success by firm alliance	Factors that influence firms' abilities to build successful alliances; greater alliance experience and the creation of an alliance function lead to greater alliance success.
Borgatti and Cross (2003)	Information seeking and learning in social networks	Information seeking by knowing and valuing what another person knows; getting timely access to a person´s thinking; costs as a factor.
Østerlund and Carlile (2003)	An RV-perspective on knowledge-sharing in complex organizations in practice	Identification of relational forces in practice; characterization of relations; boundaries in practice.
Sydow, Windeler and Wirth (2003)	International network market entry from relational perspective	Success relates to the ability to build relational competence and relational networks.
Duschek (2004)	CA by inter-firm resources	Demarcation of the RV from approaches in the field of the strategic management (e.g. MBV, RBV, etc.); sources and barriers of imitation of relational CA.

Asanuma (1989) investigated the productivity in the Japanese industry (with a focus on the Japanese car industry) and found out that the productivity in the value chain of the firm increases if the firm is willing to invest in cooperation and relation-specific assets in order to achieve a unique resource combination. Other investigations dealt with the cooperation of firms to generate rents, with certain factors, such as learning, the reduction of transaction costs and the resource pooling in the focus of the attention.[161] The investigations revealed that

[161] See also Dyer (1996a; 1996b), Hamel (1991), Teece (1987) and Dore (1983).

investments in inter-firm relationship-specific resources can lead to a reduction of manufacturing costs along the value chain by an optimization of processes (Dyer and Singh, 1998: 662). Therefore, Tables 11a-b present the approaches MBV (Industry Structure View), RBV and the RV in a summarized comparison.

TABLE 11a: Comparison of the Industry Structure, RBV and RV of CA, part 1

Dimensions	**Industry Structure View (MBV)**	**Resource-Based View**	**Relational View**
Unit of analysis	Industry	Firm	Pair or network of firms
Primary sources of supernormal profit returns	Relative bargaining power Collusion	Scarce physical resources (e.g., land, raw material, inputs) Human resources/know-how (e.g., managerial talent) Technological resources (e.g., process technology) Financial resources Intangible resources (e.g., reputation)	Relation-specific investments Inter-firm knowledge-sharing routines Complementary resource endowments Effective governance

Source: adapted from Dyer and Sing (1998: 674); modified

TABLE 11b: Comparison of the Industry Structure, RBV and RV of CA, part 2

Dimensions	**Industry Structure View (MBV)**	**Resource-Based View**	**Relational View**
Mechanisms that preserve profits Industry barriers to entry	- Government regulations - Production economies/ sunk costs	Firm-level barriers to imitation - Resource scarcity/ property rights - Causal ambiguity - Time compression diseconomies - Asset stock interconnectedness	Dyadic/network barriers to imitation - Causal ambiguity - Time compression diseconomies - Inter-organizational asset stock interconnectedness - Partner scarcity - Resource indivisibility - Institutional environment
Ownership/control of rent-generating process resources	Collective (with competitors)	Individual firm	Collective (with trading partner)

Source: adapted from Dyer and Sing (1998: 674); modified

In relation to the effectiveness and efficiency of interaction with up- and downstream value-added processes, investments in shared resources are particularly promising (Dyer and Singh, 1998: 662).[162] CAs are therefore not only

[162] On the basis of empirical studies von Hippel (1980) investigated the importance of cooperation between firms for the value chain of the involved firms. In the automotive industry cooperations are established in order to optimize value-added processes. Freiling and Sieger (1999: 6) describes a supplier alliance, whose production facilities were focused on the production of vehicle modules in a common production facility in Hambach by using the example of MCC Smart. There, the value creation processes of several individual suppliers

dependent on the contributions of a firm alone but rather on the cumulative contributions of all alliance partner of a strategic group.

In the further course the dissertation takes a closer look at potential sources for the generation of relational rents and mechanisms to preserve relational rents.

5.2 INTER-FIRM NETWORK AS A BASIS FOR COMPETITIVE ADVANTAGES AND RELATIONAL RENTS

Already in RBV the importance of internal firm resources was discussed for the generation of CAs. The equipment of firms with strategically valuable resources that allow the firm to achieve a CA and higher rents than normal is not generally homogeneous among market participants. Therefore, different firms have various distinctive internal strategically valuable resources.

In order to compensate for deficits[163] of strategically valuable resources or to protect its own resources, firms can cooperatively[164] act in a network.[165] This way they can couple or complement their in-house resources by bundling (e.g. in the logistics of airport baggage handling, the management of airport-specific projects, financing, etc.) which may create a better competitive position and generation of rents. The literature refers to those resources that are based on networks between firms as "network resources" (Gulati, 1999: 399; McEvily and Zaheer, 1999: 1152; Duschek, 2004: 61).

This bundling of strategically relevant resources beyond the boundaries of a firm in a network of various interrelated firms is expected to combine the generation of resource-based inter-firm CAs (Duschek 2004: 61). Duschek (2004: 62) defines the resulting relational CAs as: "(…) above normal profits or inter-organizational quasi rents which are fundamentally generated in inter-firm

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were linked. MCC coordinates the activities of the suppliers and achieves a value share of 25% of the vehicle production.

[163] This also includes the lack of options to access to strategically valuable resources outside the cooperation (e.g. by buying, corporate structure, etc.) (Dyer and Singh, 1998: 667).

[164] Cf. Subchapter 3.2 (fn. 59) and 4.2.2 (fn. 131).

[165] Cf. Subchapter 5.1.

relations" and continues "(…) they cannot be generated by one of the participating firms alone, but only within the scope of the joint, idiosyncratic contributions of the specific partners of cooperation" (ibid: 62).[166] Dyer and Singh (1998: 662) "(…) define a relational rent as a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners." For the generation of relational rents[167] Duschek (2004: 62) refers to Dyer and Singh (1998: 662) and states:

"Relational rents generally arise when network partners exchange (material or immaterial) resources and / or invest in inter-firm resource relations, and / or use governance mechanisms which lower transaction costs and / or

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[166] Cf. Subchapter 7.1.2.

[167] Duschek (2004: 67) refers here specifically to the Burt-rent and the Coleman-rent and their relation to the social network theory. Burt-rents are achieved by firms who bridge gaps by the occupation of structural gaps in networks and thereby behave opportunistically or optimize their non-substitutable position in an egoistical manner. Networks (e.g. hub-networks) in which Burt-rents are achieved are largely unsuitable for knowledge-sharing and mutual learning to achieve sustainable competitive advantages, and always include the risk of egoistical exploitation of network relationships for own benefit (the main reason for the failure of alliances).

In contrast Coleman-rents base on stability of the relations between alliance partners and the decision of the collaborating firms to work and to solve problems together (even where are optional other partners available). By the interaction of the partners their focus is on creating new joint know-how and optimizing the related processes. Firms achieving Coleman-rents handle their relationships with partners on a trustworthy and stable basis that often results in unique network identities. That means Coleman-rents refer to the quality of relations between core partners and include the option to exchange the partner in case of problems that cannot be solved. Firms generating Coleman-rents are flexible to new long term opportunities and related relationships, are embedded in a group of firms that supports long term trust among its members, and are able to generate relational rents.

enable the realization of 'added value' by a synergetic combination of (material or immaterial) resources."

The synergistic combination of the resources of network partners will be considered again in connection with CI.[168] Dyer and Singh (1998: 662) refer in addition to the "synergetic combination of assets" specifically to "(...) knowledge, or capabilities". This synergy can lead to rents which are in total larger than the individually achievable rents of a firm outside the network. Various studies also show the synergies in the context of corporate networks and business alliances to achieve relational bonds, and that the creation of economic value has a decisive and positive influence (Dyer et al., 2008: 137). Various studies[169] have also presented that synergies within the framework of firm networks and alliances among firms have a crucial and positive influence on the generation of relational rents and the creation of economic value (Dyer et al., 2008: 137).

Thus, a manufacturer of a BHS may compensate own performance deficits by the synergistic combination of own and foreign resources, and can in consequence be perceived as a supplier of a system solution, who is potentially competitive and seriously participating in the market.

Due to the connection to the social network theory and the concept of network resources, the term of social capital[170] (Duschek 2004: 62) is conceptually used. Social capital is described by Adler and Kwon (2002: 23) as "(…) the goodwill available to individuals or groups. Its source lies in the structure and content of the actor´s social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor".

Within the framework of the RV social capital is understood as a bundle of resources that is mainly based on a social network of inter-firm relations (Duschek 2004: 62). Therefore, the synergistically combined resource bundles can lead to new achievement bundles which the firms engaged in the inter-firm network would not be able to achieve alone. Hence, under the framework of the

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[168] Cf. Subchapter 7.1.2 and Subchapter 7.2.1.

[169] See also McConnel and Nantel (1985), Koh and Venkatraman (1991), Anand and Khanna (2000) and Kale et al. (2002).

[170] See also Gulati (1999), Gulati et al. (2000), Lee et al. (2001).

RV, the existence of an inter-firm network represents the basis for the emergence of CAs and the generation of more than normal rents.

5.3 SOURCES OF RELATIONAL COMPETITIVE ADVANTAGE

In the RV the search for CAs in order to generate relational rents is focused on the relationship network in which a firm is involved.[171] The collaboration in the relationship network, which is based on the idiosyncratic contributions of the cooperation partners, should generate permanent and stable above-average profits (Dyer and Singh, 1998: 662).

The generation of relational rents is favored if the market relations between the partners differ from normal market relations (arm's-length market relationships).[172] Dyer and Singh (1998: 661-662) state that "Arm´s-length market relationships are characterized by 1. non-specific asset investments, 2. minimal information exchange (e.g. prices act as coordinating devices by signaling all relevant information to buyers and sellers), 3. separable technological and functional systems within each firm that are characterized by low levels of interdependence (…), and 4. low transaction costs and minimal investment in governance mechanisms (Williamson, 1985)" and conclude that "Under these conditions it is easy for firms to switch trading partner with little penalty because other sellers offer virtually identically products" (Dyer and Singh, 1998: 661). Arm's-length market relationships are not suitable to generate relational rents, because they do not generate idiosyncratic relationship between the alliance partners and therefore are not able to create a unique customer-supplier relationship, which is significantly different from other customer-supplier relationships (Dyer and Sing, 1998: 662).

Idiosyncratic relationships include the risk of high transaction costs if the transaction partner changes and the need for further separate transactions arises.That means in fact that under these conditions firms are not able to generate relational rents due to a non-existent exchange relationship (Schindler, 2015: 173). No exchange relationship between firms, but instead an arm´s-length

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[171] Cf. the discussion in Subchapter 5.1 and 5.2.

[172] Cf. chapters 3 and 4 about the market relationships of these approaches.

relationship that enables achieving returns via other customer-supplier combinations, means that this kind of relationship is characterized by neither being rare nor difficult to imitate, and differentiation advantages are only available with greater bargaining power (Dyer and Singh, 1998: 662; Schindler, 2015: 174).

This may be especially critical in markets where customer-supplier relationships are characterized by homogeneity of products and dynamic changes of relationship partners. Suppliers face difficulties in such markets if they want to establish a sustainable relationship with customers, because the access to the customer via the product is only possible for a short time and can quasi exist for the duration of a transaction (perhaps exclusively controlled by the customer) and possibly there is no, or only little need for consultation or advice.

Therefore, the time required for the successful presentation of competences depends on the length and complexity of the transaction. An example could be the procurement of standard parts (e.g. screws) and their purchase via the catalog or Internet platform of a supplier. Due to industrial standardization screws within the appropriate standards are technically homogeneous products and optionally available from several suppliers.

Differences between suppliers are only temporarily possible through pricing and the conditions of payment and delivery, which supports an easy change of the supplier. The supplier, who could possibly see a possible base for expanding the business relations in the customer, has next to no opportunity to offer further achievement potential when the customer will not open further access or shows no willingness to cooperate within the framework of an transaction that is beyond the original transaction relationship.

In the field of BHS, where complex systems are adapted according to the specific requirements of the customer, the regulatory function is executed by a combination of a system specification and procurement regulations, which lead to a quasi-homogenization of the offered product (BHS).[173]

Thereby a manufacturer of BHS cannot demonstrate his firm-specific product benefits as a CA and is forced, within the framework of the impending

[173] Cf. Subchapter 8.6.2, Subchapter 8.6.4 and Subchapter 8.6.6.

transaction, to find other ways in advance of the homogenization in order to be different from his competitors. This forces the potential supplier of a BHS to find CAs in advance of the homogenization that may influence the procurement positively and possibly also exist beyond it. Therefore, the involvement of the customer in the form of an opening in favor of the development of an inter-organizational relationship is necessary. If the customer is not willing or this opening does not happen, the building of a dyadic cooperation based on a relationship leading to relational rents is difficult or simply impossible.

In order to create the conditions for the emergence of a sustainable CA and achieving relational rents alliances must be made that have different qualities than arm's-length relationships.

Dyer and Singh (1998: 662) note that "alliances generate competitive advantages only if they move the relationship away from the attributes of market relationships" and select four categories of inter-organizational CAs (Dyer and Singh, 198: 662): "1. investments in relation-specific assets;[174] 2. substantial knowledge exchange, including the exchange of knowledge that results in joint learning; 3. the combining of complementary, but scarce, resources or capabilities (typically through multifunctional interfaces), which results in the joint creation of unique new products, services, or technologies; and 4. lower transaction costs than competitor alliances, owing to more effective governance mechanisms" (Williamson, 1985)"[175]

Dyer and Singh (1998: 662) conclude that firms can achieve relational rents if they are able to build alliances and to "(…) combine, exchange, or invest in idiosyncratic assets, knowledge, and resources/capabilities, and/or they employ effective governance mechanisms that lower transaction costs or permit the realization of rents through the synergistic combination of assets, knowledge, or capabilities". The following Subchapters will discuss the determinants of inter-organizational CA in more detail and will also highlight the related sub-processes which are necessary to generate relational rents.

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[174] Cf. Subchapter 5.3.1 (e.g. the purchase of a shared building)

[175] Cf. Schindler (2015: 174).

5.3.1 Relation-specificity of assets

Williamson (1988) differs in non-specific and specific investments within the framework of the transaction cost theory. Non-specific investments are characterized by the fact that they can be sold without any major loss of value and thereby provide some protection against a loss of the value of the invested capital. The specificity describes thereby the extent to which a transaction is supported by unique investment by the firms involved in the transaction (Dietl, 2007: 1751; Klein et al., 1978). Specificity means at this point that the affected assets have to be strategically precious and unique, so that in an alliance CAs can occur (Dyer and Singh, 1998: 662). However, specific investments cannot be resold without a loss of value, because the investments are tailored to a specific transaction (transaction-specific). An example may be the investment in special machinery and equipment, or in human capital or a special location. However, in order to generate rents, the presence of specific assets is essential (Amit and Schoemaker, 1993: 39). Duschek (2004: 63) argues that: "Inter-organizational rents are accomplished when specific investments of alliance partners are achieved in co-specialised resources". Investigations from Asanuma (1989), Parkhe (1993), Saxenian (1994), Nishiguchi (1994), Enright (1995), and Dyer (1996a) support this argument and confirm, "(…) that relational rents generated through relation-specific investments are realized through lower total value chain costs, greater product differentiation, fewer defects, and faster product development cycles" (Dyer and Singh, 1998: 663-664). With regard to the investment of the alliance partners in relation-specific assets, in addition to installing safeguards, the frequency of the transactions to be carried out and have a significant influence on the possibilities of generating relational rents is also crucial (Dyer and Singh, 1998: 664). In this case, the transaction frequency may influence the production costs of the alliance partners, because with increasing transaction volume for a particular use, dedicated assets can be exchanged against general-purpose assets, as the efficiency of the exchange relationship between the partners is enhanced, the more the volume and the scale of the transactions increases (Dyer and Singh, 1998: 664). This can be illustrated with reference to Williamson (1985), who differentiates the following three types of asset specificity:

(a) Site-specific assets: Site specificity refers to the merging of immobile resources (e.g. production facilities, production buildings, etc.) of the alliance

partners so that they can achieve CAs by cost efficiency in their synergistic cooperation. According to Dyer (1996a) such cost efficiencies may arise from the reduction of transportation costs, storage, communication and coordination[176] with resource synergies, since the cost of a jointly produced product are lower than for products that are manufactured in separate firms (economies of scope). Investigations by Asanuma (1989), Parkhe (1993), Saxenian (1994), Nishiguchi (1994), Enright (1995), and Dyer (1996a) found that site-specific investments support the cooperation between firms and that the commitment to non-recoverable investments has positive effects on the performance of the cooperating firms. Investing in site-specific assets adds to the specific value-added activities within the cumulated value chain related to the overall achievement. At the same time a dyadic dependence of the alliance partners from each other occurs. If, within the same cumulative value chain, the customer also makes achievement contributions and participates in the creation of the product, then the customer is integrated into this process. The discussion in chapter 7 about CI will deal with this problem in more detail.[177] Investments in site-specific assets can establish an entry barrier for new competitors, as well as an exit barrier for members of the relationship and so act as a protective mechanism in both directions.

(b) Physical asset specificity: Physical assets can be understood as final products, which are closed in themselves, can consist of a number of components and result in functional objects at the end of an manufacturing process (Deutsches Institut für Normung, 2016). Therefore, physical assets can be machines or production lines etc., as long as they are not transaction-specific in terms of their use and represent unspecific capital investments. Dyer and Singh (1998: 662) state: "Physical asset specificity refers to transaction-specific captital investments (e.g. in customized machinery, tools, dyes, and so on) that tailor processes to particular exchange partners" and continue that physical asset specificity "(…) has been found to allow for product differentiation and may improve quality by increasing product integrity or fit" Dyer and Singh, 1998: 662). Transaction-specific

[176] Cf. Subchapter 5.2 (fn. 161) as example for the coupling of the added value chain of alliance partners in order to achieve competitive advantage.

[177] Cf. Subchapter 7.1.2. (fn. 242).

investments in physical assets can be made by the alliance partners and are not unilaterally restricted to the group of suppliers.

Customers may also invest in specific physical assets and enter into a dependent relationship, to the benefit of the supplier who provides the physical assets. As an example the acquisition of a Microsoft Xbox, Nintendo Wii or Sony PlayStation can be used. All three products are in direct competition to each other and are not mutually compatible systems. Assuming that the customer does not behave opportunistically and invests in all three systems, in consequence he has to decide for one of the systems. The customer accepts that due to the incompatibility of the systems he concisously decides against the use of the non-selected systems. By investing in one of the systems, the end-user ends the transaction-related competitive situation of the system suppliers and enters ex-ante in a relationship of dependency with the respective system manufacturer. This dependency relationship can be exploited by the system manufacturer to the effect that the end-user has to buy system-specific physical assets in the form of complementary products (e.g. games, add-on components) offered at a higher price level. If the end-user refuses this offer, his transaction-specific investment in the application is limited and he is excluded from the possibilities of the system. If an airport, for example, has made a decision for an electric control system of its baggage handling logistics, then this decision influences all other control level as well, top down into the customer-specific application components. An operating system with diverging technical control system components is usually excluded due to interface problems. The airport has therefore consciously decided against the use of an alternative control system and consciously accepts the resulting system-related dependency, which is associated with an effect on subsequent decisions on future projects. However, if the end-user accepts this dependency and invests in physical assets as specific increases, the transaction-specific investment volume increases, which constitutes an exit barrier from the manufacturer-customer relationship. If the customer tries to break out of this relationship, he faces the risk of losing the investment he has already made. Therefore, physical asset specificity can be a tool to the exclusion of the competition and to strengthen the relationship between the transaction partners.

(c) Human asset specificity: Human asset specificity refers to the accumulation of know-how that is specifically related to the transaction (Dyer

and Singh, 1998: 662). During the duration of the relationship between the transaction partners they have the chance to accumulate specific knowledge about each other (Duschek, 2004: 63). They learn more about each other, and get insight into procedures, processes, routines, systems, etc. (e.g. the supplier´s engineers learn the systems and individual aspects idiosyncratic to the customer). Dyer and Singh (1998: 662) state that during the collaboration of the transaction partners human co-specialization increases; they get experiences in working together, collect transaction-specific information and know-how, and learn to use the same language. This results in a mutual communication which is based on effectiveness and efficiency, and leads to a reduction of communication errors and mutual misunderstanding with a positive effect on quality and speed to market (Asanuma, 1989; Dyer, 1996a; Dyer and Singh, 1998: 662) and opens the chance to develop trust between the transaction partners that reduces the risk of uncertainty as an safeguard acting as a protection of the relation-specific investment (Schindler, 2007: 70). On this basis, the manufacturer of a BHS can develop an understanding of the problem that has to be solved for the customer, which can be useful as the basis for a (common) solution development.[178] Therefore, the inter-organizational exchange of knowledge supports and promotes the development of a broad knowledge base that can be used by the involved transaction partners to generate new resource bundles, capabilities and skills and in consequence also new achievement bundles, which can lead to CAs and the generation of rents.

5.3.1.1 Duration of the protection

Especially cost intensive investments need protection against opportunistic behavior of partners and justify the installation of safeguards[179] in order to ensure

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[178] Cf. Subchapter 7.6.3 that deals with early information and knowledge processes.

[179] Cf. Subchapter 5.3. An investigation by Dyer (1997) revealed that the suppliers in the Japanese car industry procect their costly investments in relation-specific assets by safeguards of 8 years, while in the United States car industry only an average protection for 2.3 years was offered by automobile manufacturers. This inevitably reduces the willingness of the American suppliers

that the transaction-specific investment can be protected (at least for a certain period) against a loss of value, e.g. by opportunism of a transaction partner.

For example, in the area of corporate finance such protection can take place by the inclusion of additional equity investors (e.g. as in a joint-stock company), as the equity investors own considerable decision and control rights (e.g. on the appropriation of profits, the confirmation or dismissal of the board, etc.) (Dietl, 2007: 1754).

In the field of baggage logistics this is rather less realistic. Suppliers of BHS are more interested in the installation of safeguards that in protecting them until and beyond the tender time. Therefore they try to develop specific achievements that meet this requirement. Specificity acts as a mobility barrier, because it can eliminate competition, but also the mutual dependence of the transaction partners (and the risk of exploitation) increases (Dietl, 2007: 1751).

In the course of this a transition from an ex-ante non-specific to an ex-post specific achievement relationship takes place, that Williamson (1985: 61-63) described as a fundamental transformation.[180] The ex-ante phase is characterized by more intense competition, while the ex-post phase, due to the definition of the contract partner, is characterized by an increase in the progressive power of the relationship (Dietl, 2007: 1754). Possibly there is intensive competition during the ex-ante phase, which does not exist during the ex-post phase after the contractual partner is defined and the specificity degree increases with the proceeding of the project and the progressive development of the achievement relationship (Dietl, 2007: 1754).

The literature mainly deals with the protection of specific investments of the transaction partners after a contract or an achievement relationship has been established. The protection of the ex-post achievement relationship by safeguards

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to invest in relationship-specific assets, as the risk of uncertain reimbursement of the transaction-specific investments is given. This means that transaction partners are more willing to invest in relation-specific assets if effective safeguards are installed (Williamson, 1985).

[180] Cf. Subchapter 4.2.2.

between subsequent transaction partners can already be prepared during the ex-ante unspecific performance relationship.[181]

While there is still intensive ongoing competition, an ex-ante selection of suitable transaction partners can at the same time address the potential acceptance of subsequent safeguards. On the one hand this increases the acceptance of the need for integration of safeguards, on the other hand it reduces the required time and thus the cost (transaction costs) the potential transaction partners need to spend in order to protect their transaction-specific investments.

As an example the area of public tenders for BHS in the legal framework of the SektVO can be used,[182] where the general conditions for the participation in public tenders are regulated. Suppliers of BHS usually have to pass an application process in order to be approved to participate in the tender procedure as potential transaction partner (§20 SektVO). The tender procedure gives the awarding authority or the end-user (airport) a prior resource assessment of the potential transaction partners, and evaluates their economic and financial capacity (§ 20 (3); (4) SektVO) from the perspective of reducing the execution risk.This process ensures that only a potent and qualified group of bidders is allowed to participate in the tendering procedures. With the conclusion of the contract, the ex-ante unspecific relationship changes to an ex-post specific achievement relationship that is transaction-specific. This is possibly easier to secure, because only an already qualified and approved bidder can enter the ex-ante phase to tender, and these industry-standards are generally accepted as safeguards. To secure their specific investments the relationship partners get closer to each other the more the achievement relationship and the cooperation progresses (Dyer, 1996a).

At the same time the transaction partners receive relative transparency about the achievement contributions and intentions of the partners, which possibly places them in a position to be able to develop a defense strategy against opportunistic behavior of a transaction partner. The duration of the safeguards affects the willingness of the transaction partners to invest in relation-specific assets (Dyer and Singh, 1998: 664; Williamson, 1985). The more it is possible to

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[181] Cf. e.g. the discussion of the transaction theory by Williamson (1985), Dietl (2007), and Dietl and Royer (2003).

[182] Cf. Subchapters 8.6.4 and 8.6.5.

exclude opportunistic behavior of the transaction partners over a long period, the more potential arises for the transaction partners to generate relational rents from their investment in relation-specific assets (Dyer and Singh, 1998: 664). The deterrence of a potential loss in value of the investments made by early termination of the relationship between parties support a possible interest in a long-term agreement to exclude opportunistic behavior by efficient safeguards and hence a corresponding assurance of generation relational rents.

5.3.1.2 Transaction volumes among firms

In addition to the duration of safeguards, the volume of inter-firm transactions is another subprocess that can support the generation of relational rents. This process is specifically dependent on the development between the alliance partners in terms of scale and scope (Dyer and Singh, 1998: 664). If the volume of the transactions between partners increases, they are forced to cooperate more closely, as contrasting behavior could jeopardize the relation-specific investments. The more often and the longer the partners collaborate, the more efficiently they can develop their relations. Consequently they are able to implement more special and complex governance structures when transactions recur (Williamson, 1985) and to develop relation-specific resources (Duschek 2004: 63). Relation-specific resources can develop on a long term basis and with increasing transaction volume. Dyer and Singh (1998: 664) also argue that alliance partners are able to increase the efficiency of the exchange relationship with increasing volume and scope of the transactions, and thus can increase the potential for achieving relational rents. Due to the increasing number of transactions, the transaction partners gain knowledge of each other and can optionally synchronize their processes, so that interface losses can be reduced and processes can be made more efficient. This means that under a long term perspective, the increasing volume of transactions can lead to the development of relation-specific resources due to the relationship between the alliance partners (Duschek, 2004: 63). The volume of the transactions and the improvement of the efficiency can lead to the generation of relation-specific rents.

5.3.2 Systematic knowledge-sharing

The exchange of knowledge[183] within the framework of a cooperative collaboration between firms can make an important contribution to achieving CAs.[184] Von Hippel (1988) investigated various industries in terms of their innovation sources and found that approximately two-thirds of the industry-specific innovations are attributable to the involvement of the customer (Dyer and Singh, 1998: 664). Based on his specific knowledge about the branch of industry and its capabilities, the customer is often able to initiate ideas for solutions to problems that are taken up by his partners and, if necessary, further developed in cooperation with the customer or with partners. The better this exchange of knowledge within the network of customers, suppliers or partners, the more superior it is compared to cooperation networks with less effective functioning knowledge-sharing routines (Dyer and Singh, 1998: 664). Duschek (2002) argues that dynamic cross-enterprise learning, and thus the corresponding innovative development potential, depends on the implementation of knowledge-sharing routines. Duschek (2004: 63) describes the corresponding network structures with reference to Dyer and Nobeoka (2000: 364) as "(…) a more efficient organizational arrangement of knowledge transfer and recombination than hierarchies, especially in the case of distributed and complex knowledge stocks".

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[183] Dyer and Singh (1998: 665) divide knowledge into information and know-how and "define information as easily codifiable knowledge that can be transmitted" without loss of integrity once the syntactical rules are required for deciphering it are known. Information includes facts, axiomatic propositions, and symbols" (Kogut and Zander, 1992: 386). Compared to information "know-how involves knowledge that is tacit, 'sticky', complex, and difficult to codify (Kogut and Zander, 1992; Nelson & Winter, 1982; Szulanski, 1996)" (Dyer and Singh, 1998: 665). Dyer and Singh (1998: 665) continue that "these properties suggest that know-how is more likely to result in advantages that are sustainable. As a result, alliance partners that are particularly effective at transferring know-how are likely to outperform competitors who are not."

[184] See also Levinson and Asahi (1996), Powel et al. (1996), Dyer and Singh (1998).

Investigations by Powell et al. (1996) revealed that the source of innovation in biotechnology firms is the network and not the individual firm; nonadherence to specific network behavior inhibits innovation and thus may act as a massive competitive disadvantage for non-established businesses. Corresponding network organizations that serve the exchange of knowledge are also established in the airport sector.[185] By inter-firm knowledge-sharing routines alliance partners will be able to generate rents (Dyer and Singh, 1998: 665). Dyer and Sing (1998: 665) define the term inter-firm knowledge-sharing routine "(…) as a regular pattern of inter-firm interactions that permits the transfer, recombination, or creation of specialized knowledge (Grant, 1996). These are institutionalized inter-firm processes that are purposefully designed to facilitate knowledge exchanges between alliance partners". Furthermore, Dyer and Sing (1998: 665) state "The greater the alliance partners´ investment is in inter-firm knowledge-sharing routines, the greater the potential will be for relational rents". This is based on the idea that knowledge-sharing routines between alliance partners represent a asset that is tailored to the specific situation of the partner and their constitution, is related to specific transactions and has a certain degree of complexity and uniqueness, so it is rare, non-tradable, difficult to imitate or substitute, and can therefore meet the criteria for achieving a CA and the creation of relational rents. Transferring knowledge alliances between partners opens potential for the optimization of less effective processes and to develop mutual ideas, processes, products, and services in inter-firm collaboration to achieve advantages in competition by the creation of relational rents. Inter-firm knowledge-sharing routines were encouraged and supported by the partner-specific capacity to absorb knowledge, by incentives for transparency of knowledge stocks and the related processes, and the discourage of free riding (Duschek, 2004: 63)[186] will be considered below.

[185] Airports are e.g. organized in the ADV, IATA; suppliers, e.g. in GATE e.V.

[186] See also Mowery et al. (2002), Dyer and Nobeoka (2000).

5.3.2.1 Capacity to absorb knowledge

The implementation of knowledge-sharing routines between firms and their efficient use is subject to the firms' ability to apply the knowledge, so that it can used be purposefully to generate rents. Dyer and Singh (1998: 665) argue that this presents a certain "absorptive capacity" (Cohen and Levinthal, 1990: 128) of the firm, in which the firm must have acquired certain knowledge in the past in order to be able to decide which partner is most appropriate for an alliance. The term absorptive capacity is defined as "(…) the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990: 128). Therefore, the firms must be able to recognize, on the basis of firm-internal knowledge of a particular alliance partner, which knowledge is valuable and can be absorbed accordingly in the firm, so that it (e.g. synergetic) is useful and applicable. In building this knowledge base, the firm makes an investment without assurance of a secured repayment.

Dyer and Singh (1998: 665) state - with reference to previous studies by Mowery et al. (1996) and Szulanski (1996) – "(…) that the ability of a receiver of knowledge to 'unpackage' and assimilate it is largely a function of whether or not the firm has overlapping knowledge bases with the source" and continue that "(…) this is a critical component of partner-specific absorptive capacity". This makes it necessary to implement appropriate inter-organizational routines between firms that increase the frequency and intensity of knowledge exchange and allow the alliance partners the systematic identification of valuable knowledge and its transfer (Dyer and Singh, 1998: 665). In the course of business activities a firm may develop knowledge asymmetries that lead to a situation where a supplier of a BHS is able to generate knowledge from different sources and from similar logistical baggage handling problems over time. To bridge gaps in that knowledge, the knowledge base must then be compared with that of the current project customer.

The knowledge base of the airport, however, is usually limited to specific customer tasks and can contribute as individual specific supplement to fill knowledge deficits of the system manufacturer. The broad knowledge base of the system manufacturer can particularly qualify him as a supplier of BHS for a partnerhip with a customer, or can place him in an advantageous position in the competition; it signals to the airport that the risk of failure within the baggage

handling project is less than with potential partners with a more restricted knowledge base. Apart from the identification of the knowledge owners and any possible critical processes, it is helpful that the alliance partners get along well with each other, the employees develop a willingness to exchange information among themselves and alliance specific inter-firm routines are used for the transfer of knowledge, which in consequence increase the partner-specific absorptive capacity (Dyer and Singh, 1998: 665; Duschek 2004: 63).[187] Knowing critical firm-specific processes facilitates the absorption and processing of partner-specific knowledge and may lead to lower or limited impact in terms of cooperation specific transaction costs.[188] The successful exchange of knowledge between the alliance partners depends on whether the corresponding exchange processes were iteratively designed and whether the people involved are in direct and frequent contact with each other (Dyer and Singh, 1998: 666).

The intentions of the respective partners are also critical, as at the beginning it cannot be assumed that any disclosure of specific knowledge automatically leads to the formation of trust and excludes opportunistic intentions. The more it is possible to increase the exchange of knowledge by the partner-specific absorptive capacity, the greater the potential to generate relational rents may develop (Dyer and Singh, 1998: 666).

5.3.2.2 Incentives to support transparency and avoid opportunism

A high absorptive capacity of an alliance partner is barely utilized, when the other partner is not willing to share acquired knowledge and thus diminishes, or possibly even prevents, the chance of achieving relational rents. In order to counteract such consequences, it is necessary to create incentives for alliance partners so that they are motivated to cooperate, to be transparent and to exchange knowledge. At the same time it is necessary to choose these incentives in a way that excludes opportunistic behavior, which is acquired as a part of the knowledge of the alliance or represents no option to act for the involved firms.

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[187] See also Mowery et al. (2002).

[188] It should be noted that the increase in the absorptive capacity processes between the partners can also take place informally. This could deliberately be bypassed by implementing knowledge-sharing routines.

The firm that transfers know-how to an alliance partner finds itself confronted with costs of providing or mobilizing the necessary resources for the knowledge-sharing. Dyer and Singh (1998: 666) argue that these costs are "(…) comparable to those incurred by the receiving firm (…)". Here Dyer and Sing neglect that the cost to the transferring firm may possibly be higher than the cost to the receiving firm. Indeed the transferring firm provides the resources for the transfer and the receiving firm provides resources for the implementation, etc., but the learning curve of the receiving firm is steeper because of established knowledge-sharing routines between the partners, and thus the learning and implementation process is shorter due to the support of the transferring firm, which makes the implementation more efficient at comparatively lower cost. Therefore, an established supplier of a BHS, or a supplier who already shares knowledge with the airport, is possibly a CA compared to a new entrant, or to a firm that just begins to build knowledge-based or intangible asset-based customer relations in the market.

In order to compensate the cost disadvantage of the transferring firm, incentives are needed that credibly and transparently promise the transferring firm to take advantage of the transfer of knowledge or at least to cover the costs.[189] This task can fulfill " (…) formal financial incentives (e.g. equity arrangements) or informal norms of reciprocity" (Dyer and Singh, 1998: 666). Investigations by Kogut (1998) and Mowery et al. (1996) present that financial incentives, like equity arrangements, appear to be as suitable as incentives for knowledge transfer between the parties as comparable contractual arrangements.

Dyer and Singh (1998: 666) state that incentives to support transparency, reciprocity and the prevention of opportunistic behavior increase the potential for achieving relational rents by knowledge-sharing. For this purpose, it is helpful if the alliance partners already have the relevant experience regarding knowledge-sharing and prevention of opportunistic behavior.

The establishment of close contact between the transferring and the receiving firm (e.g. by integration teams that purposeful transfer knowledge from the transferring to the receiving firm), transparency with regard to interfaces,

[189] If it is not possible to cover the costs, the cooperation and the willingness for inter-organizational knowledge-sharing may decrease or cease completely.

contact partners and risks as well as knowledge about the absorptive capacity of the alliance partners are useful and are already established in many industries for successful knowledge-sharing and to achieve relational rents.

As an example[190] the German elevator motor manufacturer Wittur Electric Drives GmbH can serve, which relocated its manufacturing of application-specific elevator motors to a Chinese cooperation partner in 2013 in order to get a better chance to enter the Chinese market. In order to transfer the technology, a team of German and Chinese employees was formed, which over a long period trained the Chinese partner in all process steps for the manufacture of elevator motors. The constant and close contact with the Chinese partner, clear rules, structures and control mechanisms, the openness and transparency in questions of know-how and in dealing with each other (e.g. with different cultures) led to a stable intimate relationship between the two partners, resulting in a start of the production ahead of schedule, faster market presence and a CA over other European suppliers in the Chinese market.

In addition to the establishment of incentives, the introduction of control mechanisms is a safety measure to avoid free riding through opportunistic behavior of alliance partners. These are effective tools to stabilize and consolidate the alliance, and the sustainable protection of the decision to cooperate is indispensable. However, there is a problem in accessing the required information (in physical / organizational terms), because even if the alliance partner is transparent and works in an open manner, the relevant information may not be accessible to the other partner.

However, this access may be possible by the placement of employees (e.g. resident engineers, etc.) who reside permanently at the respective alliance partner in order to develop a close contact in almost all areas of work and so get access to information that is rarely or only sporadically available. On this basis information may be gained that secures the decision of both partners for a joint alliance ex-post and promotes its stabilization.

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[190] Own experience as responsible Director Sales & Marketing (2011-2013) for Wittur Electric Drives GmbH.

A strong networking relationship with the partner may result in unwillngness to conceal or to hold back information and knowledge that can – due to a lack of alternatives - lead to opportunistic behavior that endangers the transaction-specific basis of the alliance and thus the basis for the generation of CAs. However, a positive evaluation of the cooperation supports the willingness to extensively exchange knowledge in order to to make the alliance more efficient and successful and thus to achieve CAs and relational rents.

5.3.3 Interconnection of resources and capabilities

It is part of the basic requirements of an alliance that the alliance partners understand to interconnect their resources and capabilities (Kale et al., 2000: 224). The common combination of resources and capabilities and their possible joint development enables the alliance partners to use them as a source of relational rents (Duschek 2004: 63). Dyer and Singh (1998: 666) define complementary resource endowments as "distinctive resources of alliance partners that collectively generate greater rents than the sum of those obtained from the individual endowments of each partner." Duschek (2004: 63) states in more detail that complementary resource endowments are "distinctive network resources which create a CA through joint, synergetic cooperation[191] between the network partners that is larger than the sum of individual advantages which would have been achieved by the individual firm's use of resource stocks. Such relationally generated resource endowment is possible due to a specific combination of the already present resource stocks".

Being indivisible and idiosyncratic[192] is a requirement of the relevant resources. This creates an incentive to the firms to build an alliance with the purpose to get access to the complementary resources. The complementarity of

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[191] Synergy effects which result from synergetic cooperation can lead to cost efficiency, because the costs for a common process are lower than the costs occurring for the firms if they use divided processes.

[192] "Partners (…) combine resources or (…) develop (…) capabilities in that way that the resulting resources are both idiosyncratic and indivisible" (Dyer and Singh, 1998: 667).

the resources and capabilities as a key factor of the formation of strategic alliances, and the specific unique knowledge of the alliance partner result in a synergistic effect, where the combination of the resources creates a more valuable, rare, and difficult to imitate resource endowment than prior to their combination, and in fact leads to stronger competitive positions of the alliance compared to a individual operation (Dyer and Singh, 1998: 667). Each alliance partner has the need to create benefit by access to the resources, because none of the alliance partners should be able to purchase the resources in the market. Oliver (1997: 707) argues that "Strategic alliances allow firms to procure assets, competencies, or capabilities not readily available in competitive factor markets, particularly specialized expertise and intangible assets, such as reputation". The greater such resources of the alliance partner, the greater the potential to generate relational rents, when the synergy-sensitive resources are combined (Dyer and Singh, 1998: 667).[193] That means resource endowments are a key factor that is responsible for driving returns from alliances.[194] The firm´s ability to identify and to evaluate potential complementarities as well as organizational complementarities which provide access to the benefits of strategic resource complementarities are important to generate relational rents and will be discussed in the following.

5.3.3.1 Ability to select and assess potential complementarities

In addition to the goal-oriented synergetic combination of resources, the identification and the assessment of potential resources is one of the most important challenges for achieving relational rents. On the one hand it may be problematic to select the firm that appears to be suitable for an alliance because of its resources. In this case the selection process cannot be limited to the market of the selecting firm or strategic groups operating in the market, but rather may also be outside of this market (e.g. a firm developed a technology which is not yet applied in the market of the selecting firm). On the other hand it can be difficult to create ex-ante the value of potential resources of an alliance partner and an ex-

[193] The combination of resources of alliance partners "(…) increases the degree to which the resources are valuable, rare, and difficult to imitate (…)" (Dyer and Singh, 1998: 667).

[194] See also the studies by Teece (1987), Hamel (1991), Shan et al. (1994).

post scenario which offers the possibility to determine the value of resources, if they were already synergistically combined. Both at the selection and at the value evaluation the difficulty is to obtain reliable information, so that the truth or quality of information depends on the openness of the potential alliance partner. Dyer and Singh (1998: 668) alo state that "the ability of a firm to identify and evaluate partners with complementary resources depends on the extent to which the firm has access to accurate and timely information on potential partners".

But if this is given, the prospective alliance partner will be able to quantify the value of different combination scenarios and to decide for a partner combination that promises to generate the greatest CA and the greatest potential value growth (Dyer and Singh, 1998: 667). There firms can achieve different results of their value analysis due to their different involvement in their specific social or economic networks. Dyer and Singh (1998: 667) argue that this is due to (a) different cooperation experiences, (b) different internal search and evaluation capabilities and (c) different capabilities of information gathering, which can lead to different results.[195]

But there is the problem that usually the firms determine and evaluate in a secret manner, which means without any contact with the firm to be evaluated, and the firms therefore take the risk to evaluate too optimistically, too pessimistically or too cautiously. In the worst case this may lead to adverse decisions for or against an alliance. On the one hand, a too optimistic assessment could to a resource combination that does not fulfill its promise, which can lead to a decrease in value and the failure of the alliance. On the other hand, a too cautious or too pessimistic assessment may lead to an early prevention of a meaningful alliance, in which the synergistic combination of the resource potential of the alliance partners could result in competitive advantages, super normal returns, and relational rents. Compared with firms that are still inexperienced in the establishment of cooperations, cooperation experienced companies are at an advantage, as these are often able to evaluate the opportunities and risks that may result from the cooperation and the coupling of resources better and faster. Investigations have shown that due to the presence of

[195] The mentioned arguments represent company-specific barriers that affect the actions of the actors.

the appropriate resources, capabilities and reputation, and their integration or positioning in strategic cooperation networks, experienced firms build more successful collaborations over time than inexperienced firms.[196] Therefore, cooperation experienced firms often fall back on specially equipped departments, which have the task to select and to assess potential cooperation partners, to manage already established collaborations, to monitor and to control them and to ensure that resources and capabilities of the alliance partners will be purposefully combined and knowledge can be assimilated. These are often well positioned in strategic networks and, based on trustful relationships with other firms in the network, have access to reliable information that is not available to firms inexperienced in cooperation. The achievement of relational CA based on inter-organizational resource endowments is supported by network management experience and a strategic function and / or position of the firm within the network, which allows the necessary access to opportunities to combine resources in a manner that enables the identification and evaluation of potential resource complementarities (Eisenhardt and Schoonhoven, 1996: 137; Gulati, 1999: 413; Chung et al., 2000: 5; Duschek, 2004: 64). Therefore it can be summarized that "The ability of firms to generate relational rents by combining complementary resources increases with the firms' (1) prior alliance experience, (2) investment in internal search and evaluation capability, and (3) capability to occupy an information-rich position in its social / economic networks" (Dyer and Singh, 1998: 668).

5.3.3.2 Organizational complementarity to achieve benefits

After completing the identification of potential alliance partners and the related identification and evaluation of synergistically usable resources and capabilities, it is necessary to make the complementary resources and capabilities ex-post utilizable for the alliance. In order to avoid friction losses in the utilization of complementary resources and capabilities it is usually necessary to mutually approach procedurally so that the decision-making processes, the systems for the gaining and analysis of information as well as the corporate cultures are compatible. This compatibility allows the cooperation partners to coordinate their

[196] See also Gulati (1995), Mitchell and Singh (1996), Walker et al. (1997).

activities and to utilize the potential to generate relational rents (Dyer and Singh, 1998: 668). In practice it cannot be assumed that alliance partners have homogenized organizational structures and control processes in place which exclude friction between the firms, especially in the initial phase of cooperation.

This inhomogeneity in terms of decision-making processes, different corporate cultures and different systems can in practice lead to the cooperation failing at the operational level, despite the presence of complementary resources and capabilities.[197] Therefore, it is not enough that potential partner focus only on strategic complementarity in terms of possible resource combinations. Instead it is necessary to focus on the organizational complementarity.

There are many examples within the industry where firms try, in addition to the complementarity of resources, to build an organizational fit and in that way to increase the chances for successful cooperation. This can be achievable, for example, through a joint venture of the cooperation partners. An example from the industrial motors technology provides a better illustration. For example, the ATB Austria Antriebstechnik AG established a joint venture with the Wolong Electric Group Company Ltd. (Finanznachrichten, 2014; ATB, 2014). The joint venture is a joint local production platform for industrial electric motors in China, established under the name ATB Wuhan, to increase market shares, to strengthen the position of ATB in the global market for industrial motors, and to exploit the synergies between Wolong and ATB (ATB, 2014). Through the joint venture both cooperation partners may also establish an organizational fit, in addition to the use of complementary strategic relevant resources, by securing the transparency of information and the implementation of common operational systems and processes. In consequence the joint venture and the contained common intra-organizational activities can enable the partners to develop the different firm-specific cultures to a new common corporate culture that allows them to use the combination of resources so that CAs can be generated.

Wecht (2006: 42) argues that the compatibility of cultures, clear objectives, appropriate structures and common communication constitute another essential

[197] For more detailed information see the study by Buono and Bowditch (2003) who surveyed the reasons for conflicts (and how they could be managed) between people and organizations related to mergers and acquisitions.

basis for integration processes[198] and can lead to CAs. Dyer and Singh (1998: 668) state that "The ability of alliance partners to generate relational rents from complementary strategic resources increases with the degree of compatibility in their organizational systems, processes, and cultures (organizational complementary)". In fact both aspects are critical factors to success for the alliance partners in order to use the benefits created by the complementary of strategic relevant resources and the achievement of relational rents.

5.3.4 Effective governance

Effective governance[199] represents a key element to achieve inter-organizational CAs and relational rents due to its influence on the transaction costs and on the readiness of the network partners to invest into inter-organizational or transaction-specific value-creating processes (Duschek, 2004: 64).[200] That firm has an advantage that needs lower transaction costs to achieve the same level of investment. Less safeguarding costs motivate the alliance partner to initiate value-creating activities. The cooperation partners are investing not only in relation-specific assets in order to achieve relational rents, but also in specific resource combinations. The more specialized the resource combinations, the more valuable they are for the alliance. At the same time their value decreases in relation to an alternative use of resources. Due to the high degree of specialization of the transaction-related resources, and the lack of possible alternative uses, the alliance partners face a higher risk of opportunistic behavior from a cooperation partner. Therefore the cooperation partners inevitably develop an interest in securing and protecting their investment against opportunistic behavior. The installation of safeguards and a governance structure that on one hand reduces transaction costs and on the other hand enables increased efficiency is the goal of their risk limititation (Dyer and Singh, 1998:

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[198] Cf. Subchapter 7.5.

[199] Cf. Dyer and Singh (1998: 663) and Fig. 1.

[200] For example value creation by investments into relation-specific assets, knowledge-sharing, and / or the combination of complementary strategic relevant resources (Dyer and Singh, 1998: 670).

669). Gulati and Singh (1998: 781) understand the term "governance structure" as "the formal contractual structure participants used to formalize [the alliance]". Dyer and Singh (1998: 670) argue that "The greater (…) the ability is to align transactions with governance structures in a discriminating (transaction cost minimizing and value maximizing) way, the greater the potential (…) for relational rents".

5.3.4.1 Enforcement of governance mechanisms

The willingness to implement a governance structure underlines the intention of the alliance partners to engage in a common value creation. Nevertheless, due to the risk of the partners facing opportunistic behavior, enforcement agreements are necessary to stabilize the relationship between the partners and to present a base of common understanding. Dyer and Singh (1998: 669) distinguish between two classes of governance: (1) "third-party enforcement agreements" and (2) "self-enforcement agreements".

Third-party enforcement agreements, e.g. like legal contracts, need an enforcing party to solve a dispute between the parties. Such a third party can be the state or a legal authority. In case of a dispute or conflict between the alliance partners it is often a decision by the court (as the third party) that solves the conflict.

This can for examply apply to the deviation of required installation material (e.g. electric wires, pipelines, etc.) during the installation of a BHS on a customer's site, which can lead to deviations from the negotiated BoM and to an increase or decrease in the supplier´s achievements. The main issue is not that the costs to solve the conflict are probably high, but that the alliance partners, who cannot solve a dispute or conflict without a forced third-party involvement or decision, obviously face difficulties in creating a trustful relationship to each other. In the worst case scenario, they are not able to establish a trustful relationship in order to generate relational rents. In the best case the relationship between the partners survives the third party decision, meaning that each partner accepts the decision and the partner continue to try to generate relational rents. In this case the relationship could be burdened by the continuous uncertainty of renewed opportunistic behavior, as there is no more inhibition to involve a third party. However, the partners may also be protected from future opportunistic behavior

due to the fact that there is less hesitation to involve a third party, and each partner has a very clear understanding of the rules to solve the dispute. Nevertheless, that means that third-party enforcement agreements do not seem ideal or preferred as a governance structure to achieve relational rents.

In contrast, self-enforcement agreements are agreements where "no third party intervenes to determine whether a violation has taken place" (Telser, 1980: 27). Here the alliance partners are forced to communicate with each other, without help from third parties, and to deal with the conflict and solve it by common agreement. Duschek (2004: 64) argues that "Especially relevant for preventing the eminent danger of opportunism in the context of achieving relational profits is the ability to utilize self-enforcement governance mechanisms, and informal self-enforcement governance structures, in particular, which mainly contribute toward building trust among the partners".

Assuming that the mutual expectations of the partners will not be disappointed, self-enforcement agreements provide an opportunity to build trust[201] between partners. Mutual and open communication between the partners, clear ideas about the goals, processes and practices to achieve the desired results and the common development of mutual understanding may then result in a strengthened relationship.

Compared with third-party enforcing governance mechanisms Dyer and Singh (1998: 670) argued that self-enforcing mechanisms have a higher efficiency by lower transaction costs and higher value-creating initiatives, which lies in the fact that (a) the alliance partner have confidence in the equitable disbursement of the generated revenue which thus can lead to reduced contract costs, (b) they need not invest in expensive monitoring systems, (c) incur lower adaptation costs due to the mutual trust, so that adjustments in the process according to changing environmental or market conditions can be made at any time (Uzzi, 1997: 48), (d) "are superior to contracts minimizing the transactions costs over the long run because they are not subject to the time limitation of contracts" (Dyer and Singh, 1998: 670), and (e) "superior incentives for value-creation initiatives" (Dyer and Singh, 1998: 671). Thus, self-enforcement agreements are a relevant basis for the achievement of relational CA and the generation of relational rents.

[201] Cf. Subchapter 5.3.4 (fn. 200).

5.3.4.2 Employment of governance mechanisms

In the previous chapter self-enforcing governance mechanisms are discussed as a basis for achieving relational rents. Dyer and Singh (1998: 669) divide self-enforcing governance mechanisms into formal and informal safeguards (formal / informal self-enforcing agreements). They understand formal self-enforcing agreements as economic resources (e.g. equity) which will be consciously designed and aligned to be able to control opportunistic behavior by encouraging the economic objectives of the partner (Dyer and Singh, 1998: 669).

The joint venture that was already discussed in Subchapter 5.3.3.2 could be a useful example. Through the connection that both partners enter by means of the joint venture and the common manufacturing facility, a close connection is established between the two initiating firms. This is not only done in connection with capital, but also for joint investments in equity visible to other strategic groups, for example, in a common manufacturing facility or in machinery and equipment. Opportunistic behavior would increase the risk in the consumption of investments, and thus the partner of the joint venture would risk losing his entire investment value. Therefore, the associated uncertainty and the fear of this risk support a trustful relationship between the partners. In a positive development of the joint venture the investments of both partner gain value. This strengthens the original decision taken for the joint venture investment and reduces the incentives for opportunistic behavior. Informal safeguards[202] (e.g. like goodwill trust[203],

[202] Dyer (1997: 535-556) describes that Japanese auto companies use informal safeguards such as trust and financial hostages rather than legal contracts to reduce transaction costs with their suppliers. Dyer argues that on one hand the initial developing costs of trust are high; on the other hand-over a longer period trust is more effective than contracting, because contracting requires a revision process for every transaction. He also found that the transaction costs of General Motors were twice as high as Chrysler´s and six times higher than Toyota´s, due to the evaluation of suppliers that the General Motor´s organization is less trustworthy.

[203] Trust can be divided into two dimensions: goodwill trust and competence trust (Das and Teng (1998; 2001). Goodwill trust with its linkage to relational risks refers to the expectation that a partner has the intention to fulfill its role in a

reputation[204], etc.) are based on personal (e.g. direct experience) or indirect (e.g. reputation) trusting relationships among actors, which makes imitation difficult or almost impossible for competitors.

Large parts of the literature[205] argue that informal safeguards constitute an efficient and cost-effective governance mechanism and can have a positive impact on the level of transaction costs (e.g. regarding the negotiation, monitoring, and control of agreements) compared with contractual agreements. The more it is possible to minimize the transaction costs and at the same time to maximize the transaction value, the higher the potential to generate relational rents (Dyer and Singh, 1998: 670). This is supported by the fact that it requires a certain time until informal safeguards can be developed, because they must be based upon a positive transaction history. Moreover, developing trust between partners follows certain rules which are connected with positive expectations in terms of minimizing the risk of opportunistic behavior and the behavior of the partners associated in the relationship. A study by Zaheer et al. (1998) among manufacturers of components for the electronics industry on the inter-organizational and interpersonal influence of trust on performance, found that mutual trust reduces transaction costs for the partners in negotiations and conflicts and thus trust has a positive influence on the performance of the alliance partners. Therefore, informal safeguards in the form of social capital, such as

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certain relationship (Lui and Ngo, 2004: 474). The partners rely on perceptions and attitudes of key personnel (trust guardians) or organizational boundary persons (Child, 2001; Currall and Judge: 1995). Competence trust is linked to performance risk (and to resources and reputation) and refers to the expectation that a partner has the ability to fulfill its dedicated role (Lui and Ngo, 2004: 474).

[204] The term reputation describes the experience based on external assessments (possibly also trust), which an individuum or an organization has with other actors. Reputation plays a significant role in the assessment of future behavior of A as a potential interaction partner of B, especially in situations that are contractually incomplete or cannot be detected. Reputation today represents the equivalent of the traditional expressions of honor or virtue.

[205] See also Sako (1991), Barney and Hansen (1995), Hill (1995), Uzzi (1997).

goodwill and trust, are a basis requirement to achieve relational CA (Duschek, 2004: 64) and relational rents.

5.4 PREVENTION OF THE IMITATION OF RELATIONAL RENTS

The protection of relationship-based CAs and rents must be one of the most important topics of the concerned firms in order to keep their CA in the market and to be able to achieve sustainable relational rents. Thus, for example, the development of goodwill and trust is a process that cannot be developed in the short-term between the potential partners; it is highly complex and dependent on the specific situations. In the short term, or confidences acquired in the framework of agreements (e.g.: 'The parties agree that a trustful and cooperative relationship between the parties is the basis of the collaboration') cannot exclude the risk of opportunistic behavior. This kind of clause usually lacks certain specific confidence-building situations that characterizes the cooperation between the partners and their modes of action and thus can form the basis for the development of trust. Therefore, building confidence depends on the situational interactions of partners, their expectations of actions and the corresponding degree of fulfillment of these expectations. As shown in situations where the partners react to and have to assess the fulfillment of their expectations, the development of trust is a protracted process that can neither be bought nor sold and is particularly worthy of guarding against imitiation and substitution.[206] As part of the argumentation in the RBV imitation barriers have already been discussed. In addition, Dyer and Singh (1998: 671-674) have identified more relationship-based imitation barriers, which are addressed below.

5.4.1 Asset connectiveness among firms

An effective barrier to prevent imitation among firms is the combination of assets of the collaborating firms (Dyer and Singh, 1998: 672). In the course of this the combination of relationship-specific resources creates resource bundles, which can only be achieved through linking them in order to enable the collaborating partners to achieve CAs. Within the connection of the partners resource

[206] See also Arrow (1974), Sako (1991), Duschek (2004).

combinations may not only be used, but also further developed together in order to jointly achieve a higher efficiency of resource combinations and to protect them against imitation from the competition. At the same time, it is also possible that the partners are placed in a position that enables them to make follow-on investments based on relation-specific resource combinations. The site-specific investment of a final customer and its supplier in a common manufacturing facility can serve as an example. Through the joint investment, both partners can align their processes to each other in a manner that their resource combinations act more efficiently than when operating separately. By linking the resources and experiences that the partners jointly made, they are capable of developing the resource combinations further (e.g. manufacturing equipment) so that this development of a relationship-specific resource combination is a highly specialized asset that can enable the partners to achieve CAs. By permanently developing the resource combination further, and with the creation of highly specialized assets, the alliance partners create a timely and knowledge-based advantage[207] compared to their competitors.[208] This means that the linking of the organizational resources of the collaborating firms is an effective imitation barrier because due the to related path dependencies, relational rents are difficult to imitate. At the same time this allows the conclusion that firms should develop relationship-specific resources in order to generate relational rents and to use the full potential of their collaboration.

5.4.2 Partner availability

The non-availability of a potential partner that would be able on the one hand to bring the required complementary resources in the cooperation, and on the other hand be willing to enter in an alliance, makes the imitation of CAs

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[207] To achieve a timely and knowledge-based advantage will take a crucial role in the further course of the discussion, e.g. Subchapter 8.6.7, Subchapters 10.4, 10.5, 10.6 in regard, for example, to the activities ex-ante to the decision.

[208] Cf. Dyer and Nobeoka (2000: 365) cite a manager from Toyota, who states: "We are not so concerned that our knowledge will spill over to competitors. Some of it will. But by the time it does, we will be somewhere else".

difficult (Dyer and Singh, 1998: 672-673). For the firm willing to imitate, the generation of CAs, which are based on a collaboration with another firm, depends on the ability to find the right potential partner under time pressure or time restrictions[209] (or to select from a number of already known firms), who is suitable for the generation of resource-based CAs. But when a potential partner is selected this does not mean that he is willing to cooperate, so the potential partner needs to be convinced of the advantages of the cooperation. In order to be able to argue correspondingly an argumentation must be found that meets the perspective or position of the potential partner and reveals benefits or motivation factors for the firm that has to be convinced. This is connected with time and costs, because the firm that wants the cooperation has the need to act on a very intensive basis (cf. fn. 207).

Dyer and Singh (1998: 673) state "The key strategic implication of this isolating mechanism is that there are strong first mover advantages for those firms that develop a capability of quickly identifying and allying with partners possessing complementary strategic resources and / or a relational capability." In this process late movers have the disadvantage that due to their late entry into the search and selection process they might be faced with the situation that those potential partners who have the necessary strategic resources are otherwise tied in cooperation and thus not available.

Even if incentives or motivation arguments then convince the potential cooperation partner and promise better incentives than it can generate in an already existing cooperation, the costs of dissolving an existing cooperation are possibly higher by the loss of the investments made (as well as the loss of reputation for possible future collaborations) and prevent the willingness to cooperate.[210] Duschek, 2004: 65) states: "Thus, a key implication for this imitation barrier is that there is a first mover advantage for finding complementary

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[209] Cf. also the Subchapters 8.6.4, 8.6.5, and 10.4.1.3 (Tab. 37, early development of suitable partnerships, value: 17; 100%, time to offer for building relationships to short, value: 12; 70.59%).

[210] Although this means that first movers have an advantage in the selection of appropriate partners, it does not mean that this is necessarily the best alternative cooperation (e.g. due to own preferences).

network partners". Additionally, Dyer and Singh (1998: 672) state that "In other instances potential partners may simply lack the relational capability or the relation-building skills and process skills necessary to employ effective governance mechanisms, make relation-specific investments, or develop knowledge-sharing routines (…)".

Therefore partners who already have the necessary cooperation experience (e.g. to find and to commit to a cooperation partner) with other firms or have relational capacities available are preferred and interesting cooperation candidates and "have the chance of creating and safeguarding inter-organizational competitive advantage" (Duschek, 2004: 65). Therefore "(…) relational rents or cooperative core competencies are often not easy to imitate (…)" (Duschek, 2004: 65), "because potential alliance partners with the necessary complementary resources and the relational capability are rare" (Dyer and Singh, 1998: 673).

5.4.3 Indivisibility of resources

The indivisibility of resources represents another imitation barrier. Resources can be developed within the framework of cooperation by alliance partners or occur by a combination of existing resources and can be idiosyncratic as well as indivisible (Dyer and Singh, 1998: 673). In addition, the alliance partners can further develop the resource base together and can integrate the relation-specific resources inseparably into the business cooperation.This "mutual co-evolution of capabilities" (Dyer and Singh, 1998: 673) can lead to the demarcation of relation-specific resources, not without a negative or destructive impact on CA, and to minimize or makes its imitation by network-specific path dependencies nearly impossible (Duschek 2004: 66).

Projected on the example of the joint manufacturing facility mentioned in Subchapter 5.4.1, the separation of relation-specific resources of a partner led to the manufacturing line no longer being operated by the cooperation partners together in the form of co-evolutional resources, mutual coordination of the interfaces and processes is not optimized, and access to the resources of the alliance is reduced, at least for one of the partners. This leads over time to friction losses, an increase in costs and in consequence to a loss of relation-specific CAs

and rents of the partners, which in this example arose only through the combination of the relation-specific resources.

However, with a joint co-evolution of resources, the alliance partners would provide a basis for the mutual generation of rents. With the progressing of the alliance the partners learn to use the advantages and the benefit of the cooperation in a better way. Gulati et al. (2000: 204) argue that the advantages of the co-evolution of resources can be reduced by disadvantages, because network relationships always include opportunities and limitations at the same time.

Therefore, the partners may possibly lose control and influence and thus flexibility to be able to use the resources individually for themselves (Duschek 2004: 66) which leads to the conclusion that individual networking firms are only able to build relational rents to a limited degree (Duschek, 2002: 263). Thus, resource indivisibility represents an effective barrier against the imitation of relation-specific CAs and relational rents.

5.4.4 Formal and informal standards

Another imitation barrier is provided by formal and informal standards as a part of the institutional environment of firms. The cooperative behavior of the firms should be ruled by certain institutional frameworks, with the purpose to reduce the transaction costs associated with the risk of opportunistic behavior. (Duschek, 2004: 66) states that these are regionally-specific formal or informal behavioral standards, which "can hardly be imitated, as they require global institutional modification".

Here the application of the rules for public tenders (GWB, SektVO) in the airport industry can be used as an example. These standards regulate specifically the conditions for the participation of firms in public procurement and the implementation of corresponding contracts between the airport and the supplying firm (e.g. for a BHS). Subchapter 8.6 will discuss this in greater detail.

The trust in the functioning of these rules subsequently reduces the risk of the acting firms and results in lower transaction costs. Such institutional frameworks act as a barrier to imitate relational rents, since they block the easy access or entry of external firms to the market. Since short-term changes of

regionally-specific institutional frameworks (e.g. legal rules) can hardly be expected, they can prevent the imitation of relational rents.

5.5 CRITICAL ASPECTS AND FURTHER DEVELOPMENT

The RV presents a complementary view to the RBV and provides recommendations for the achievement of sustainable profits and CA by a firm-focused approach based on inter-firm relations and networks. The previous discussion found that the generation of relational rents is difficult for competing firms due to the following points (Dyer and Singh, 1998: 673-674):

- Causal ambiguity hinders competitors to ascertain what is generating returns
- If the competitors found what generates the returns they are not able to replicate the necessary resources;
- Asset stock interconnectedness hinders competitors to imitate practices and / or investments;
- The competitors are not able to find a partner with the necessary complementary resources and capabilities;
- Due to the indivisibly of the resources or the co-evolvement with another firm the competitor is not able to access the resources and capabilities;
- The competitors are not able to replicate distinctive and socially complex institutional environments (formal and informal rules) acting against opportunistic behavior in order to motivate to behave cooperatively.

Dyer and Singh (1998: 675) argue that "(…) a pair or network of firms can develop relationships that result in sustained competitive advantage". They integrated the benefits firms achieve if they collaborative in networks, and argue that firms can generate relational rents through knowledge-sharing routines, relation-specific assets, effective governance and complementary resource endowments and identified the isolating mechanisms that preserve relational rents achieved by the efficient collaboration between firms.

Duschek (2004: 68) presents some weak aspects of the RV, and argues that:

- The RV does not explain completely the processes of the generation of long-lasting CA;
- The actual value-generating process is not explained;
- The evolution of resources to achieve CA, beside the sources of the generation of relational rents and inter-organizational imitation barriers, remains unexplained;
- How the process to generate relational rents takes place stays more or less outside the focus of the RV.

Duschek (2004: 69) continues his argumatation that a core problem of the RV is connected with the inter-organizational relations as the focus of the analysis. He further argues that "if it is pointed out that *inter*-organizational rents and resources are always directed at *intra*-organizsational resources (...), there is a danger that the relational approach of the strategic management neglects the organizational level and the significance of resources of the embedded single network firms (…)", because a "(…) inter-firm profit achievement *always* have to take *intra*organizational and *inter*-organizational resource processes into consideration, e.g. the recursive interplay between these closely related levels"[211] (Duschek, 2004: 69).

With a focus on surveying the problem discussed in this dissertation, Schindler (2015: 176) argues that the RV by Dyer and Singh (1998) provides the most promising approach to generate relational advantages based on the connection of inter-organizational assets by successful relationships between collaborating firms in an industry. Instead of an industry (MBV) or a single firm (RBV) it applies a network of firms as the basic source of supernormal profit returns, based on four potential sources of inter-organizational CAs.[212] Accordingly the RV presents an essential view with focus on assets needed for crafting CA under circumstances of high complexity (e.g. in industries with homogeneous products and services, like in the baggage handling industry).[213] The applied theoretical view must be particularly applicable under conditions

[211] Cursive letters are according to the original.

[212] Cf. Dyer and Singh (1998: 660); Schindler (2015: 176).

[213] Cf. Schindler (2015: 176).

where the focus is placed on the crafting of sustainable CAs due the combination of (relational) assets of allied firms. Therefore, the theoretical view must be applicable under conditions of homogeneous products and services and needs not only to focus on relative bargaining power (MBV). Taking this into consideration, the RV is the ideal applicable theoretical framework to investigate the generation of CAs under conditions of homogeneous products such as in the baggage handling industry.[214]

[214] Cf. Subchapter 6.3.

6 INTERMEDIATE RESULT I

In the 1960s companies faced a situation of changing economic environmental conditions. This situation led to a change in the view on the role of enterprises, which prepared the basis for the development of a theoretical framework on strategic management (Hungenberg 2011: 57).[215] Based on Chandler's (1962) analysis of the performance of U.S. corporations, which led to the result that the development and design of the organizational structure follows the strategic direction of the company, Ansoff, Andrews, and Chandler placed the foundation stone for two paths of strategic management. One path, the strategy process research, deals mainly with the formulation of strategies and their implementation. It is assumed that the strategic decision-making process consists of a systematic series of stages. The other path of strategic management is strategy content research, which examines the actual content of strategic decision-making and in the 1960s and 1970s spawned the determinants of success. Based on case studies investigations were carried out to discover the reasons for differences in entrepreneurial success. Due to the lack of a theoretical and practical foundation, the results remained doubtful and could not escape criticism. A reorientation and development of the MBV[216] in the 1980s was the result.

The aim of strategic management is to secure the long term survival of businesses and to earn a return on capital (Sloan, 1963: 49). Therefore, it is essentially concerned with the crucial question of how to explain differences in

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[215] See also Chandler (1962), Ansoff (1965), Andrews (1971) and Ansoff, Declerk and Hayes (1976) delivered the fundamental base for the development of a strategic framework (Bea and Haas, 2001: 15; Hungenberg, 2011: 57), which prepared the basis for further studies and the establishment in practice in the 1980s.

[216] The most popular representative in the recent literature is Michael E. Porter (1980), who developed the view on the industry structure (MBV).

the success of firms and how firms can achieve sustainable competitive advantages in order to generate the highest possible value.

Several strategic approaches have been developed in the form of strategy views, partly shaped by multiple and contradictory aspects, but which will help to build companies competitive advantages against their competitors. Competitive advantages are necessary for the long term corporate objective, which is the maximum value that can be achieved. The strategic views show specifically important operational factors and functions in terms of value, which are not directly observable and affect the value chain and the success of a firm (Stölzle et al., 2007: 1), differentiated in the recent literature in internal and external oriented approaches (Stölzle et al., 2007: 5-6). Outward-looking approaches explain the success of companies depending on internal characteristics and can differ in the Resource-based view, Knowledge-based view, Capability and Resource Dependency approach, and the Relational view as one of the latest.[217] The three basic and essential views – the Market-based view (MBV), the Resource-based view (RBV), and the Relational view (RV) - that are of interest for the rest of the discussion in this paper are outlined below once more in conclusion.

6.1 MARKET-BASED VIEW

The MBV is a milestone in the development of strategic management (Hungenberg, 2001: 61). Based on the work of Mason (1939) and Bain (1956) the development of an approach can be traced back to Porter[218]. On the basis of the modification of the basic idea of the industrial economy he developed the approach of the 'five forces' model of competition. The model is based on five competitive forces that determine the competition within an industrial structure: bargaining power of customers, bargaining power of suppliers, rivalry among competitors, new entry of potential competitors, and the threat by substitute

[217] Cf. the RV is based on the research of Dyer and Singh (1998).

[218] This means Porter (1980). He used principles of economics and theoretical contributions of industrial economics and applied this to strategically relevant issues (Hungenberg, 2001: 61).

products. The stronger the forces the stronger the competitive intensity, and the lower are the chances of success in the creation of competitive advantages. Porter distinguishes between two basic strategies: cost leadership and differentiation.[219] Porter's approach is an outside-in perspective that shapes a firm's value chain based on its strategic positioning on the business market (outside-in)[220] and asymmetries between firms within the same strategic sector that are pursuing similar strategies, but with varying degrees of success. The view from the direction of the market to the business of the firm within an industry in which a firm operates shall be applied to find, to ensure and to defend strategic competitive advantages and long term success, which are the basis for supernormal profits and lead a contribution to the development of added value. For the representatives of the MBV, the most important starting point is the understanding of the market. On this basis they develop a successful competitive strategy, based for example on cost leadership or differentiation. The focus of the discussion is placed on the adaptation to the environment of the firm, the market and the industry in order to achieve competitive advantages as the basis for supernormal profits and a contribution to the added value of the company. The chain effect of MBV can be described as follows: The market structure determines the market conduct of the firm, which in turn determines the success of the firm in its industry.[221] The goal is to build a competitive advantage over other companies in the same industry and to defend the achieved advantage against competitors.[222] The focus is on finding a strategy that is based on industry-specific market circumstances in which the company operates. Under examination is the question of why only certain companies can compete effectively and thus achieve

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[219] Cost leadership and differentiation are different in that companies that prefer a cost leadership strategy are focused on planning, production, and selling at lower costs than competitors. Companies seeking differentiation strategies try to provide a unique, distinctive and customer-driven product with the aim to give the customer a benefit advantage (Fließ, 2009: 80).

[220] Cf. Zentes et al. (2004: 27) and Jonas (2005 : 21).

[221] Cf. Wirtz (2003: 38).

[222] Cf. Zentes et al. (2004: 27) and Jonas (2005: 21).

long term returns. As a basis for the consideration the SCP-paradigm is used.[223] Structure, conduct, and performance build on each other; the market structure determines the strategic commercial behavior upon which the return of the enterprise (performance) depends.

The unilateral approach by the end of the market perspective views the firm as a black box, where the participating firms in an industry are more or less homogeneous, and neglected in-house resources. If companies were homogenous within industries and the approaches of MBV were satisfied, it would not be possible to answer the question exhaustively as to why some companies in an industry are more successful than others. This leads to the conclusion that it is the different internal factors of companies in a branch that have an impact on the firms' success and ensure that companies cannot assume homogeneity. Andrews (1971) already thought that the success of a business is not only down to opportunities and risks, but also depends on the strengths and weaknesses of the firm. Competitive advantages can be attributed not only to external but also internal resources.[224] The MBV places the attractiveness of an industry in the focus of attention on the basis of established industries. Strategies which may create new markets or effectively intervene in competitive processes are neglected in this approach (Bea and Haas, 2001: 26). The long term success of firms will be largely determined by differences in the industry structure. The possible fast imitation of the generic strategies and the insufficient consideration of environmental impacts by the static view avoid, due to their dynamics, the generality of the MBV approach.

Based on the above described deficits of the MBV, especially due to the lack of consideration of the relationships among the concerned market players, the

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[223] The SCP-Paradigm by Bain (Industrial Organization, 1968) deals with the relationship between market structure (structure), the market behavior (conduct) and the market outcome (performance) and is also known as the Bain-Mason paradigm.

[224] Human capital, human resources were mentioned by Bea and Haas (2001: 26). Knowledge and the ability to get and to share information rapidly shall be also mentioned in this place.

MBV approach is not sufficient to comprehensively answer the research question of this dissertation.

6.2 RESOURCE-BASED VIEW

The resource-based view (RBV) views the internal resources[225] of a firm as the most important starting point for the explanation of competitive advantages.[226] The basic assumption is that firms have a pooling of resources, and the basis and origin of a firm's success is in its available resources. The focus of the business activities is thus - in contrast to the MBV - within the firm, whose competitive advantage is based on such internal resources and their combination. The chain effect of the RBV can be described as follows: The resources of a firm define its strategy in the market, which in turn affects entrepreneurial success (Wirtz, 2003: 38). Andrews (1971) refers in his classic approach to the formulation of strategies on organizational competencies and resources. That strengths and weaknesses of a firm are due to its resources goes back to Penrose (1959) and in the RBV generates supernormal returns at the enterprise level rather than at the industry level (Müller-Stewens and Lechner, 2001: 276), which understands firms not as administrative entities but as a bundle of resources.

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[225] Recent literature presents several definitions to describe resources. Classical economics usually means by ‘resources’ the production factors, labor, land and capital, while this traditional classification will complement the current literature by factors of knowledge and social system (Schonert, 2008: 24). This is in contrast to the economic point of view, which understands resource as an input-output relationship, and approaches which represent business economic resources as tangible and intangible factors, tangible and intangible assets, systems, processes and values of a company. According to Prahalad and Hamel (1990; 1995) capabilities and competencies are also covered by the term resources.

[226] Barney (2001: 643) tries to position the RBV relative to three theoretical traditions: the SCP-based theories (industry determinants and firm performance), neoclassical microeconomics, and evolutionary economics. A similar analysis is beyond the scope of this paper.

The work by Wernerfelt (1984) and Prahalad and Hamel (1990) and was crucial for the dissemination of the RBV. The weaknesses of the previously discussed MBV, namely that there are differences in the performance of companies not adequately explained by their positioning in the market or membership in a particular industry, led to the development of the approach of the RBV.[227] Wernerfelt (1984) defines resources as "anything that could be termed a strength or weakness of a given firm (…) (tangible and intangible)". Bea and Haas (2001: 27) discuss that this includes production equipment and facilities as tangible financial resources, and that intangible resources are for example the company's image and know-how.[228] The outside-in view of the MBV is contrary to that held in the RBV. The basic input is the quality of resources as a basis for achieving corporate success. The RBV explains that the basis of the development of competitive advantages lies in resources and capabilities for the creation of competitive advantages. The capabilities of a firm, which can be found in resources and governance systems, shall enable the company to use the resources in a goal oriented way. This can be illustrated by the RCP-paradigm, in which strengths and weaknesses (resources) of the firm create the central design point (conduct) and are responsible for the success (performance) of the firm (Schwarz, 2003: 82). The RCP-paradigm can be described as a chain of events: work resources (e.g. capabilities, competencies (Prahalad and Hamel, 1990; Hamel and Prahalad, 1995) as well as resources), as strengths, and weaknesses (i.e. company policy), which lead to the generation of rents[229] (e.g. profit of the company) (Voigt, 2008: 265).

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[227] Cf. in detail Jentsch et al. (2011: 736).

[228] Cf. additional Johnson et al. (2011: 128) as well as Jentsch et al. (2011: 736).

[229] The microeconomic concept of rents means those revenues that exceed the opportunity cost of using the resources in an industry and do not engage new entrants in the market. Zimmer (2005: 110) defines economic rents as income from the use of resources, which is higher than the necessary costs required to obtain control over the resources. Companies keeping control about certain resources behave as rent-seekers (Schulze, 1994: 173).

Contrary to the neoclassical model of perfect competition,[230] the firm is shown to be inhomogeneous and not as a production function, which is freely accessible to all market participants. Peteraf (1993: 180) refers specifically to four criteria that determine the competitiveness of companies: resource heterogeneity, ex-post limits to competition, imperfect resource mobility and ex-ante limits to competition. These forms are the four cornerstones of her approach to creating competitive advantages. Heterogeneity[231] as the basis for the emergence of monopoly or Ricardian rents is assumed here; i.e. that firms with different skills are able to stand in the market in competition with each other and thereby to reach at least break-even. Ex-post limits to competition are necessary to sustain the rents, while imperfect resource mobility is responsible for the binding of the rents to the firm. Ex-ante limits to competition were required for preventing the cost from offsetting rents.[232] The RBV focuses mainly on Ricardian rents. In order to earn these permanently, it is necessary to ensure the superior input factors (resources), which are inelastic with respect to their occurrence and thus cause the

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[230] The neoclassical model of competition is characterized by perfect competition, homogenous products and constant returns to scale. This is a static equilibrium model, the were terms derived deductively in mathematical models and identified by Knight (1921): rational behavior of all market players, full market transparency, infinitely fast reaction speed of all market participants, full mobility of factors of production, an infinite number of market participants, equal market access, etc. Because of these conditions, and the fact that the model is based on purely theoretical considerations and does not reflect reality, an increase in affluence in the optimum is not possible, the boundaries of the model are clear, so that a perfect competition cannot be achieved. Acc. to Barney (2001: 664) it "(…) focuses on how market forces determine the quantity, quality, and price of goods and services sold in a market."

[231] According to Barney (1991) firms with different skills are able to compete in the market and to achieve break-even. Firms with marginal resources are only able to achieve break-even. Companies equipped with superior resources are able to obtain rents. Industry demand and the supply conditions determine the minimum efficiency level required to break even (Peteraf, 1993: 180).

[232] More details are available in chapter 2.

company lower average costs than their competitors. The combination of resources, which are used as analysis unit at the RBV, leads to rents (Müller-Stewens and Lechner, 2001: 276), and via their management form the basis for the success of a company in the market (Hungenberg, 2011, p. 63). The resources and capabilities that will ensure the permanent position of a company's advantage in the market in competition against other participating players form the core competencies of the company.[233] In order to assert itself in achieving lasting and sustainable success and long term gains in the market, a company must be able to concentrate on core competencies, and is successful if able to generate rents over a longer period of time.

The RBV looks into the black box of the firm built by the MBV and tries to capture the ongoing internal operations at the microeconomic basis. While the MBV regards the homogeneity of firms within an industry, the RBV's approach regards the resources of the firm and the firms within the branch of industry as heterogeneous. Therefore, it requires that enterprises are different in their resources. The problem with the RBV is an isolated view of the resources of the company as a source of financial rents. This can only achieve additional value by the combination of various resources and the development of complementary relationships. It is not clear whether any result is achievable with the RBV approach, and if, and in which way, valuable resources develop to generate rents (Müller-Stewens and Lechner, 2001: 278-279).

Especially the complementary relationship and the goal-oriented bundling of resources to achieve rents in the RBV is one of its biggest weaknesses. This is because even in the RBV - just as presented in the MBV – there is no discussion about the relations between the players and a possible combination of their resources. But exactly those combinations of resources and complementary relationships between the players of a branch are crucial to the achievement of competitive advantage in complex business structures. As a result of the above-mentioned weaknesses of the RBV it can be highlighted that the RBV is not appropriate to answer the problem of this dissertation. This means that an approach is needed that takes both into account: the interactions of the

[233] Core competencies were described as strategic advantages, which are the basis for CA (Krüger and Homp, 1997: 22).

relationships of various actors and the goal oriented combination of their resources. This approach is the Relational view (RV).

6.3 RELATIONAL VIEW

While the MBV considered the structure of an industry over five forces that are intended to describe a industry in an outside-in perspective, the RBV relates to the accumulation of resources that should be rare, difficult to imitate, valuable, and not to be substituted, thus helping the firm to establish CAs (Barney, 1991; Rumelt, 1984; Derickx and Cool, 1989, Wernerfelt, 1984).

The relational view (RV), however, can be regarded as complementary supplement to the RBV. The RV is focused on firm-wide networks and inter-organizational relationships as operational success factors. Companies that use their resources collectively and work together are able to generate a CA over other companies in the industry. These CAs can therefore not be generated by one company alone but only by a special contribution of community partners (Dyer and Singh, 1998: 661-662). The RV also considers the resources of a company, due to the fact that it interconnects them in a manner that creates CAs from the cumulated resources of the interconnected firms. According to Dyer and Singh (1998: 660) the RV selects four potential sources of inter-organizational CAs and describes them as follows: relation-specific assets (e.g. purchase of a shared building), knowledge-sharing routines (especially information), complementary resources / capabilities (e.g. consolidation of scarce resources), and effective governance (e.g. reduction of transaction cost).

Prior (2006: 17) states that the RV of the firm by Dyer and Singh (1996) offers an interesting framework on which stakeholder relationships can be based by using the four key variables.[234] Due to the fact that the MBV and the RBV do not explicitly consider strategic relationships and networks as a unit of analysis,[235] the RV will be used by the author in following as the preferred view in order to discuss the problem of this dissertation.

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[234] Cf. Schindler (2015: 176).

[235] The RBV considers relationships only as one of many resources (Wernerfelt, 1984: 21).

7 CUSTOMER INTEGRATION

In the B2B sector enterprises often encounter customer requirements that demand solutions that go beyond the mere manufacturing of standard products (Kotler and Bliemel, 1999: 76). Therefore, firms are trying to achieve crucial CAs by characterizing customers as an innovative resource, providing them with a more or less active role, and with participation in the innovation and development process (Sandmeier and Wecht, 2004: 31). This is possibly achievable by an active consultative and / or contributing role of the customer in the achievement creation, or by an active collaboration-based cooperation with the supplying firm (Sandmeier and Wecht 2004: 31), and marks the point where CI is set up as an approach (Kotler and Bliemel, 1999: 76).

Chapter 7[236] describes the basics of the concept of CI and thus provides the relation to the topic of the dissertation. The main focus is placed on the success factors in the process of the achievement development. In this context, the chapter also deals with basic features of the Lead User (LU) concept as an early means of customer involvement (Kotler, 1972: 48) as this is relevant for the further context of this dissertation. The chapter concludes with a consideration of the opportunities and risks and provides an outlook for CI in the further course of the dissertation.

7.1 CLASSIFICATION, RELEVANCE AND BASIC PRINCIPLE

The terms CI and integrativity are often used synonymously in recent literature. Both terms refer to the involvement of customers as buyers of a certain

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[236] Cf. Subchapter 1.1; the discussion in chapter 7 is based on Schindler (2007: 28-59). For further details see also the research contributions in the recent literature made e.g. by Kleinaltenkamp (1993; 1996; 1997), Fließ (2004), Stotko and Piller (2003), Stotko (2005), Reichwald and Piller (2003), and Kurzmann and Reinecke (2009).

achievement that can consist of service achievement or of a physical product of the supplying firm (Engelhardt et al., 1995: 48-49; Fließ, 2001: IX).

Reichwald et al. (2004: 74-75) argue that firms consistently align within the CI all relevant activities with the needs of their existing or potential customers, which in this case play a proactive cooperative role in the value chain of the firms. In this case suppliers and their customers enter into an added value-based partnership that is characterized by a connection of the system- and problem solving capacity of both firms. Enke and Poznanski (2005: 3) define CI as "(…) Mitwirkung des Kunden bei der Leistungserstellung und die zielgerichtete Transformation der gewonnenen Informationen im Hinblick auf das gewünschte individuelle Leistungsergebnis“.[237]

Over time, the need for the integration of firms in development and the manufacturing of achievements, and the resulting problems, can affect a growing number of firms. Such problems may for example involve providing the necessary integration resources and defining the appropriate interfaces, the integration of governance mechanisms, safeguards against opportunistic behavior, etc. Fleer (1996: 53) states that approximately 70% to 80% of the total cost of a product are related to product development, which lets the integration of customers in the development and the achievement of customer information in the form of a value-added partnership gain higher importance. Suppliers in the B2B sector have very good conditions to be able to work in a customer-oriented way, as customers in this area accept barely finished products (e.g. standard products) as a solution of their specific problem; hence the supplying firm works more or less closely together with the customer. In most of the cases the products relate to manufacturing equipment or capital goods (Kleinaltenkamp, 1996: 15). These goods have a more or less strong service character, as the implementation of the service would not be possible without the involvement of the customer or at least with his cooperation (Kleinaltenkamp, 1996: 15). The development of a system specification for a BHS by an authorized technical consulting firm can be

[237] Translation from GER according to Enke and Poznanski (2005: 3): “(...) involvement of the customer in the establishment and targeted transformation of the information obtained with respect to the desired individual achievement result".

used as an example. It is only possible to get access to the necessary information for the correct description of the requirements needed to design a system, structural conditions and other relevant information, due to the involvement of the airport as a customer and final user of the BHS. Consequently meaningful documents for the tendering process can be created, which then can be used as the basis for subsequent quotations from qualified manufacturers.

Engelhardt (1989: 277) argues that payments in kind are always sold in combination with material and service bundles. Kleinaltenkamp (1996: 15) states that each service process also consists of individual customer-related information, which is integrated in a kind of production factors in the achievement creation process of the supplying firm. Fließ (2004: 523) concludes that CI concerns the field of cross-product services (e.g. application related consultancy), pure services (e.g. cleaning of buildings) as well as the customized product (e.g. production of a special or customized BHS).

As stated in the example above, the involvement of the customer is of paramount importance for the creation of customized achievements, as the customer must at least provide information about the usage that can also be jointly developed between the customer and supplier (Hildebrandt, 1997: 72). Therefore, CI is characteristic for the B2B sectors (Fließ, 2004: 523) such as the manufacturing of BHS, where the relevant core processes relate to the principle of individual and contract manufacturing. Also, the conception of a BHS is customized, i.e. tailored to the individual circumstances and requirements of the customer. Based on the achievement contributions of the customer (e.g. information, passenger frequency, user profiles, etc.) the system can be developed individually or engineered from customized adapted system components in order to meet the customer's requirements and needs, to finally produce an overall BHS.

Kleinaltenkamp (1996: 15) argues that service processes are also in place in firms selling services in substantial proportions, and concludes that at this point the concept of CI is set up. A BHS-manufacturer consulting the customer in the planning phase in advance of a BHS tender can be understood as a service that is uncertain for the manufacturer in terms of its refund. Therefore, the BHS-manufacturer takes the risk of an uncertain investment in an inter-organizational relationship that is to develop on the basis of a customer contribution that is to be

integrated into the achievement contribution of the manufacturer. This happens in the expectation of achieving a CA in a possible, but not compelling, future transaction. Additionally it should be mentioned that individualization of standardized services is becoming more important. In the field of mass production for example, customers in virtually all industries are increasingly involved in the creation of achievements through flexible production technologies.[238].

In contrast to the discussed CI, mass customization (or tailormade mass customization) is based on the principle of modularisation (Stotko and Piller, 2003: 203) and means the creation of achievements for a relatively large market where the individual needs of each customers need to be met (Piller and Stotko, 2003: 55).[239] The market for BHS presents itself as oligopoly.[240] On the supply side,

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[238] An example of the possibilities of mass customization is the sportswear manufacturer Nike (Nike, 2014). The customer can individualize the selected product without altering its technical features within a standardized product range, via an Internet platform. So the customer can e.g. customize the color design of a sports shoe according to individual wishes and retain the technical features of the shoe. Due to the individualization the customer receives a sports shoe that differs from the look of standardized sport shoes. Due to the involvement of the customer, the customer identifies more with the individualized product, which may in consequence lead to a positive customer effect in terms of binding the customer and thus to a competitive advantage for Nike.

[239] In the course of the dissertation mass customization is not subject to detailed consideration; it is only mentioned for completeness and better representation of the relationships and demarcations compared to CI. For a detailed overview about mass customization see e.g. the contributions by Gilmore and Pine (1996, 91-101); Pine (1993: 23-24); DaSilveira, Borenstein and Fogliatto (2001: 1-13); Huffman and Kahn (1990: 491-513); Duray, Ward, Milligran and Berry (2000: 605-625); Kotha (1995: 21-42); Pine (1999).

[240] Kotler and Bliemel (1999: 394-395) distinguish the supply side in pure and differentiated oligopolies. Pure oligopolies therefore consist „aus einigen Unternehmen, die im wesentlichen die gleiche Ware produzieren (…)“ while

there are a few firms that offer specific technical baggage handling equipment and systems. On the customer side the market is limited to a relatively small number of airports, or airports that are willing to invest in their baggage logistics. Under the condition of product homogenization, the market form of differentiated oligopoly by means of the system specification of the airport and applying the requirements laid down in the regulations (SektVO, GWB) is transferred in the form of a pure oligopoly in this specific market. Fließ (2004: 523) argues that mass customization as a strategy seeks the simultaneous realization of strategic elements of cost and differentiation competition, where modern information and production technologies are used, which allows to connect both a low-cost production of goods as well as the sales of customized goods for mass markets. According to Piller (2001: 203-204) the customer thereby renders a contribution to the creation of the achivement, but not to the product development. However, already in the context of planning a BHS achievement contributions of the customer are necessary in order to develop a concept, which forms the basis for a subsequent tender and therefore are an important contribution in the preparation of an investment in a BHS. Fließ (2004: 542) states that CI „(…) nimmt Ausprägungen zwischen Individualisierung und Standardisierung an“.[241] Therefore, for example, mass customization is not applicable in the context of the topic of this dissertation, in the further course not subject to detailed considerations and is only mentioned for completeness and better representation of the general connections.

Kleinaltenkamp (1996: 23) defines the basic principle of CI as follows: „Das Grundprinzip der Customer Integration lautet also, das Problem des Kunden

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differentiated oligopolies consist of „aus wenigen Anbietern bestehen, die partiell differenzierte Produkte herstellen (…)“ (Kotler and Bliemel, 1999: 394, orthographic error in original). Translation from GER according to Kotler and Bliemel (1999: 394): pure oligopolies: "of a few firms that substantially manufacture the same products (...)” / differentiated oligopolies "of a few vendors manufacturing partially differentiated products (...)”.

[241] Translation from GER according to Fließ (2004: 542): “(...) takes forms between individualization and standardization".

zusammen mit dem Kunden zu lösen“.[242] As a consequence of this definition customers and suppliers must be able to achieve problem solving contributions and to provide the related potential. As a customer the airport faces the task of having to find a solution to a problem in baggage logistics. An investment in contributions to the achievement process, in terms of co-assembly partner of the manufacturer of the BHS, connected with a transfer of assembly tasks from the manufacturer to the customer, is hardly or not at all possible due to the complexity of the engineered system.[243]

A complicating factor is that due to the tendering regulations the final manufacturer of the system is not yet determined at the time of the tendering process. Thus, the achievement of the customer contribution can only consist of providing information and services. After the procurement, and besides providing information, the achievement contribution of the airport can also consist of granting rights[244] that may include that the development and manufacture of the system is easier than granting the necessary rights. Such information may concern the identification and description of the problem to be solved, but may also include active participation in the development of solutions, in the system layout and in the design of the BHS. As a result, this affects the quality of the tender documents, which form the basis for the preparation of proposals of the potential manufacturer participating in the tender process. Under

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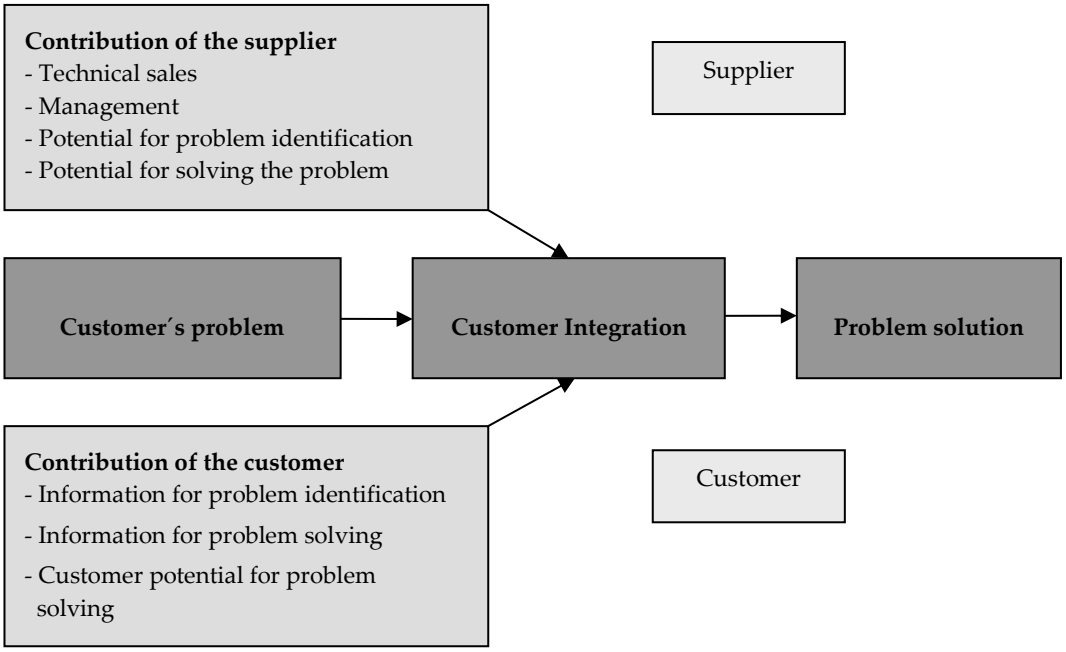
[242] Translation from GER according to Kleinaltenkamp (1996: 23): “The basic principle of customer integration is therefore to solve the customer's problem together with the customer".

[243] In addition, in the case of damages, a cause-based allocation would be difficult in terms of the cause of the damage and the identification of the responsibility, which may also lead to effects on the relationship between the parties.

[244] E.g. access rights to secure restricted areas, access rights to data, etc. rights may possibly also be tendered to the supplier in advance of the tendering process, (e.g. site visits in order to learn the environmental conditions on site). This can serve both the equipment manufacturers as well as the airport to reduce the risk in the context of the preparation of proposals as well as in the production of the BHS.

these conditions and at this early stage, the contribution of the manufacturer of a BHS may consist in the identification of the customer´s problem, technical advice, and the development of a possible solution. However, the manufacturer may also to try to influence the technical solution that will be integrated in the tender documents of the baggage handling project. If a manufacturer of a BHS is successful in the common development of a potential problem solving solution, and this forms the basis for the tender documents, this manufacturer is in an advantageous position compared to his competitors in the context of the tender procedure.

FIGURE 8: Basic principle of customer integration



Source: adapted from Kleinaltenkamp (1996: 23); modified

Figure 8 above presents the basic principle of CI. The figure illustrates that based on the information to identify the problem of the customer, a bundling of potential achievement contributions from customer and supplier is carried out, which can be used for the development of a common solution to the customer's problem.

Based on the parent approach for the integration of customers, Table 12 presents that a customer can take different roles during his integration. Accordingly Kurzmann and Reinecke (2009: 193-212) argue that the modality of the relationship between the customer and the manufacturer plays an essential role in CI-projects.

TABLE 12: Parent approach for customer integration concepts

Relationship modality / Process step	Cooperation with the customer	Delegation to the customer
Product development	**Customer as Co-Innovator**	**Customer as Informer**
Achievement creation	**Customer as Co-Producer**	**Customer as "Partial Employee"**

Source: adapted from Kurzmann and Reinecke (2009: 207)

Thus, the airport can on a voluntary basis (Kurzmann and Reinecke, 2009: 207) take on a cooperating role as innovator or co-developer in the development of a customer-specific BHS and has the possibility to participate with its achievement contributions. Kurzmann and Reinecke (2009: 207) point out that during the integration into the business processes, the customer feels "Wertschätzung und (…) daher als qualitativ hochwertiger"[245] and due to the gained experiences in regard to the quality of the service as positively influenced.

The customer is forced to integrate, as he is by own initiative motivated by commitment to his organization or by external constraints (e.g. by technological progress) to integrate achievement contributions in order to generate the overall achievement (Kurzmann and Reinecke, 2009: 207). Therefore, knowledge about

[245] Translation from GER according to Kurzmann and Reinecke (2009: 207): "appreciation and (…) therefore higher-graded".

the related modalities of the relationship can influence the likelihood of a positive progress of CI projects (Kurzmann and Reinecke, 2009: 207).

7.2 CHARACTERISTIC ASPECTS

7.2.1 Achievement dimensions

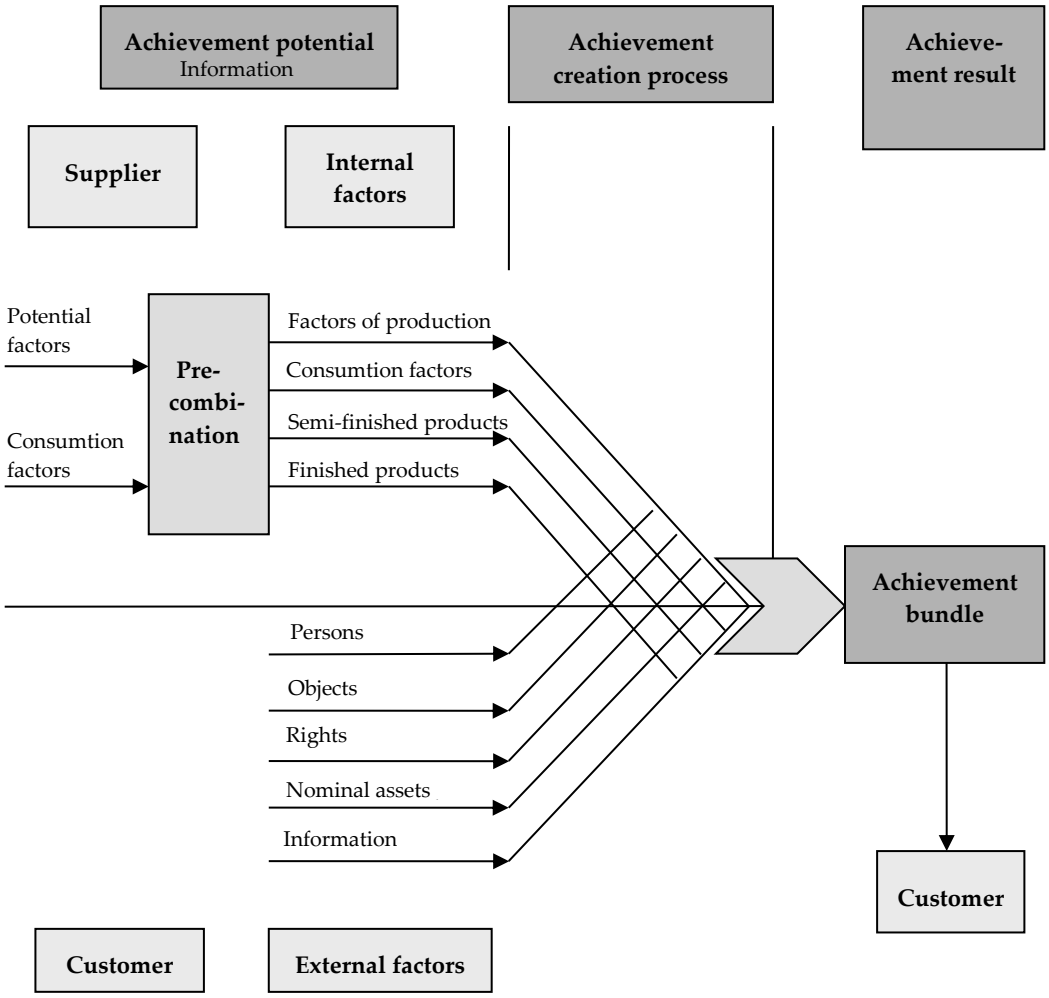
Hilke (1989: 10-11) distinguishes between three achievement dimensions that mark the particularities of CI: the achievement potential, the achievement creation process and the achievement result. Subsequently the three achievement dimensions are briefly addressed in relation to the topic of this dissertation:

Kleinaltenkamp (1993: 105) describes the achievement potential as the ability and willingness of a manufacturer of a BHS to create a achievement by the autonomous combination of internal consumption and potential factors (selection, procurement, factor combination). These factors allow the creation of the achievement; the BHS-manufacturer has the free power of disposal (e.g. tangible assets, machinery, facilities, personnel, inventories, etc.).

In the achievement creation process, the airport is the initiator for the activation of the abilities of the BHS-manufacturer. The abilities are bound in the manufacturer´s achievement potential. The activation of the achievement creation process is carried out by the airport by its integration of one or more external factors (Kleinaltenkamp, 1993: 109-110). This can, for example, be carried out by the announcement of a tender for a BHS-project. In such a case the information about the BHS-project acts as an external factor. The manufacturer has temporally limited access to the external factors[246] (Engelhardt et al., 1993: 401) and combines external and internal factors with each other. Figure 9 presents that CI then takes place in the achievement process instead, where production factors are transferred from the manufacturer of the BHS to the airport.

[246] Trommen (2002: 98) points out that this is mostly related to work performances by human resources, by objects, rights or information.

FIGURE 9: Integrative achievement creation



Source: adapted from Kleinaltenkamp (1997: 351; modified)

The achievement creation process is only tangible for the BHS-manufacturer through the concretization of the requirements of the airport by the system specification integrated in the tender documents. Now it is possible to integrate the requirements of the airport in the achievement creation process. A necessary precondition is that a process of interaction between manufacturers of the BHS and the airport takes place in advance of the start of the manufacturing of the

BHS. The lower the standardization of the achievement, the more it is necessary to intensify the process of specification of the achievement.

The BHS as a result of the achievement creation process then contains the combination of tangible and intangible components (Kleinaltenkamp, 1993: 105) to a use-creating achievement bundle (Engelhardt et al, 1993: 402-403).

7.2.2 Process types

CI-processes can be distinguished according to the type and the degree of integration.[247] The literature distinguishes the type of integration according to its causes in technically related, requirement related, information related, temporally related and spaciotemporally caused integration (Ernenputsch, 1986: 36-38; Corsten, 1985: 29-30). A precondition for the technically related integration is the presence of the customer or his property in order to create an achievement (e.g. the maintenance of a BHS component, which would be impossible without the related component). At the requirement related integration a technical creation of achievements without the presence of external factors is possible, but a technical or commercial exploitation of the achievement does not take place. For example, a manufacturer of a BHS is technically able to provide a planning capacity that is not or not yet requested by the customer. Therefore, the manufacturer's achievement potential cannot be exploited. The precondition for information related integration is the cooperation of the customer based on information transfer. There the customer participates in the planning of the factor combinations in the process of the individualization. One example may be that a manufacturer is planning to create a customized BHS for an airport. But in order to design the BHS it is necessary to get access to information about the customer's specific requirements. Therefore, information from the airport is required (e.g. number and size of baggage, number of transfer passengers, number of arrival / departure flight passengers, access information, information about specific requirements, etc.) that enables the planning and combination of the necessary potential factors. Temporal integration is characterizes by a contact between the airport and the manufacturer of the BHS at the same time or synchronously (e.g. a

[247] Cf. Schindler (2007: 36-38) about the general aspects.

telephone consultation in advance of receiving the tender documents). If the manufacturer of a BHS and the customer are in synchronous spatial and temporal contact, that characterizes spatiotemporal integration. An example may be that a personal consultation on site takes place between manufacturer and airport, in advance of drawing up the tender documents.

The degree to integrate customers is differs in recent literutre. For example, Engelhardt et al. (1993: 413-414) measure the extent of customer involvement in depth of engagement, degree of intervention, intervention period, engagement frequency and time of engagement, while Fließ (2004: 526) criticizes that this allows only inadequate conclusions for the involvement of customers. Compared with that Corsten (1985: 130) differentiates on the basis of the division of labor between the airport and the BHS-manufacturer, and captures the share which the airport has in the overall activities of the process of the creation of the achievement. Kleinaltenkamp (1993: 107) points to the particular importance of external process information, as this is information that can be integrated by the airport in the manufacturing process and states additionally that this information are suitable to activate both the performance potential and the power generation process. Therefore, the degree of CI is closely linked to standardized and individualized achievements. That means the higher the degree of the integration and the more the depth of engagement and the engangement intensity, the more customer-specific the provided achievement can be. Fließ (2004: 527) argues that the greater the difference between the information provided by the airport and the ideas the airport and the manufacturer of a BHS have concerning appropriate solutions, the harder it is for the manufacturer of the BHS to standardize the process of the achievement creation. Therefore, the manufacturer of the BHS is forced to respond individually or customize to the requirements of the customer (Fließ, 2004: 527). This is reinforced by the general precondition in the industry to offer achievements according to the specification by the customer stated in the tender documents, resulting in the homogenization of various different solutions and in consequence to system (product) related homogeneity.[248]

[248] Cf. chapter 8 and §§7, 8 SektVO.

TABLE 13: Service characteristics at different integrativity degrees

Customer participation		
Low	**Medium**	**High**
Customer´s presence is required during the achievement process	Customer´s inputs are necessary for the design of the product	Customer as co-developer
Standardized achievement	Customer inputs, in particular controlling process information individualize a standard achievement	Active customer participation controlls the individual achievement creation
Customer sets the initial impuls to start the achievement creation process	External factors are necessary for the creation of a satisfactory achievement result; supplier has responsibility and control	External factors of the customer are indispensable and crucial determine the achievement result
Example: Routine maintenance of a BHS component according to a maintenance contract	Example: Customized adaptation of existing application software	Example: Common development of a new techonology in baggage handling or a new solution of the customer´s problem

Source: adapted from Fließ (2004: 528); modified

Engelhardt et al. (1993: 406) argue that on the one hand achievement creation processes can take place autonomously, meaning without the involvement of the external factor or, on the other hand, integratively, which means including the involvement of the customer in the achievement creation process. How much the customer interferes in the manufacturing process of the BHS-manufacturer can be expressed by the degree of integration that presents the ratio of autonomous to integrative disposition (Fließ, 2004: 527) and results in varying degrees of integration as presented in Table 13.

As Engelhardt et al. (1993: 412) argue, integration processes can take place in all functional areas and, therefore, in all stages of the value chain of a firm. By the increased participation and involvement of the airport in the manufacturing process of the BHS the necessary conditions for the integration of the airport were created, which can relate to a specific order, a project (e.g. to extend a already existing BHS) or for an unlimited time.

7.2.3 Points and forms of the integration

Reichswald and Piller (2002: 29) state that only when mutual inputs face adequate additional outputs, which go beyond a purchase at the market, value added partnerships occur. The integration of the customer into the value chain of the supplier is a duty from the perspective of the costs of a firm and must be eliminated by equalizing costs effects (Paul, 1998: 143). From the perspective of the manufacturer of a BHS, it is necessary that the own value chain and CI-processes are designed in a manner so that the most possible repetition of process sequences is possible, thus economic benefits can be drawn from the costs incurred by the participation of the manufacturer´s client interventions in the area at the disposal of the BHS-manufacturer (Engelhardt and Freiling, 1995: 37-38). This can be presented by the characteristic corner points: development-to-order, match-to-order and open innovation.[249] According to Stotko (2005: 114) the point development-to-order represents that point where in relation to the customer-specific activities the strongest or most profound CI in the value creation process of the BHS-manufacturer is achieved. This is due to the fact that the BHS is possibly only to be designed and manufactured according to a customer specification that includes the ideas and requirements of the airport. In the course of this the BHS manufactured in cooperation between the manufacturer and the customer can either be rebuilt or combined by means of previously defined customizable modules or logistical subsystems to the customer's wishes into an overall product that fulfills the requirements of the customer. Stotko (2005: 115) argues that in the point match-to-order the lowest CI in the value creation process is achieved. This point is not produced by customer order but instead taken from

[249] Cf. Schindler (2007: 39-40) about the general aspects.

existing stock and distributed from there to the customer. Specific customer requirements can thereby only be considered if products are found in storage that fit the customer specifications as closely as possible. Due to the fact that BHS projects are usually mid- and long term projects the manufacture try to reduce their capital commitment related to material during the project. Therefore, the manufacturer of a BHS usually stores only material or components that can also be used in other non-customized applications (e.g. standardized manufacturing material (like screws), cables, connectors, semi-finished material, etc.). Customized system components are just-in-time manufactured or delivered. It is clear that this is of less relevance in relation to the topic of the dissertation. Stotko (2005: 115) argues that open innovation refers to the integration of customer groups into the development of achievements by means of suitable tools. Open innovation, and in consequence the expansion of the LU-approach[250], will not be discussed in the course of this dissertation.

The point of having the deepest CI is given in the development (Stotko, 2005: 115) of a BHS. In BHS projects this may be the phase prior to creation of a tender or a system specification, because there it is necessary to develop the specific BHS constellation for the respective airport, which will be the basis for the subsequent manufacture of the system. The literature additionally distinguishes between pre-fabrication (fabrication), and the assembly of the product and sales (distribution), whereof sales is the most superficial form of the CI (Lampel and Mintzberg, 1996: 24-25; Stotko, 2005: 115). The following table illustrates the types of CI according to Lampel and Mintzberg.

The forms of the CI presented in Table 14 are different in the involvement of the customer in the achievement creation process, so that the value chain without the participation of the customer (here: standard) or with his participation (here: individual), were tailored to the needs of the customer (individual). It must be critically considered that the underlying investigation of Stotko (2005) has its perspective on manufacturers in an unregulated market. In Stotko´s investigation, manufacturers can differentiate from each other through the combination of resources (potential factors) to create customized products.

[250] Cf. Subchapter 7.2.3.

TABLE 14: Forms of customer integration

	Pure standardization	Segmented standardization	Individualized standardization	Tailormade individualization	Single production
Design	standard	standard	standard	standard	individual
Fabrication	standard	standard	standard	individual	individual
Assembly	standard	standard	individual	individual	individual
Distribution	standard	individual	individual	individual	individual

Source: adapted from Lampel and Mintzberg (1996: 24); modified

The major focus is on different physical products. However, in the field of BHS the competitive conditions for BHS-manufacturers are much more complex, as they quasi cannot differentiate their products because of the necessary homogenization.[251] In contrast to the study of Stotko (2005), this means that CI may focus on other levels than on the physical product and in consequence, that the sales of the manufacturer of the BHS can possibly get a more important role in the CI-process.

7.3 STAGES OF CUSTOMER INTEGRATION

7.3.1 Single-stage customer integration

CI refers to the involvement of the customer through the integration of external factors in the production process (Engelhardt, 1989: 280; Trommen 2002:

[251] Cf. Subchapters 7.2.3 and 8.6.6.

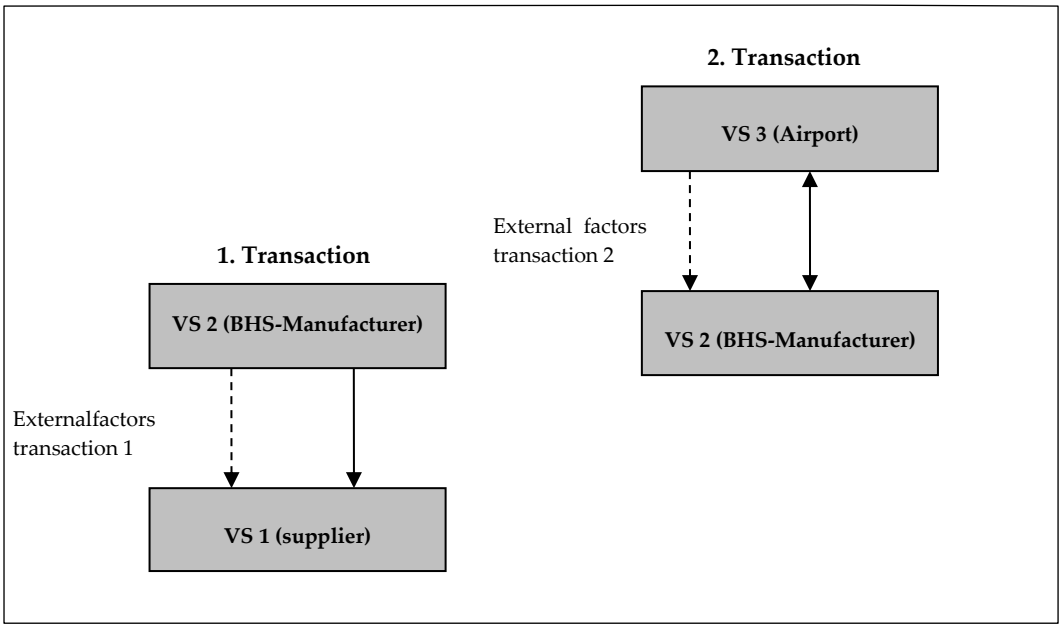
21; Rück, 1995: 15-16). CI can basically be differentiated into a single-stage and a multi-stage integration.[252]

Single-stage CI is characterized by the integration of external factors with a supplier who is positioned one step earlier in the value chain, whereby a specific bundle of external factors will be provided exclusively and be available to a firm during a transaction. Therefore the customer only interferes in the sphere at the disposal of the firm that offers directly to him (Trommen, 2002: 21).

Figure 10 presents a single-stage CI on hand of an example with three value steps (VS). First, the manufacturer of the BHS enters into a transaction with its supplier (first transaction), transaction-internally occupies the role of the customer, and provides the supplier with external factors (e.g. information). In a second transaction step the airport (VS3) in its role as a customer provides external factors to the BHS-manufacturer in order to create the achievement. The manufacturer of the BHS is now in the role of the supplier (VS2) to the airport without any involvement of the sub-supplier (supplier of the BHS-manufacturer) of the first transaction.

[252] Cf. Schindler (2007: 40-41) about the general principle.

FIGURE 10: Time sequence of transactions at single-stage integration



Source: adapted from Trommen (2002: 215); modified

Given the fact that there is no connection between transaction 1 and 2, interactions between BHS-manufacturer and airport takes place only between these two and not between the airport (VS3) and the supplier (VS1). In these dyadic transactions (Plinke, 1995: 12) that are independent of each other, the airport as a customer has no direct access to achievement contributions of the supplier VS1. The airport leaves that to the BHS-manufacturer, together with the coordination of communication between the actors. A possibly transaction supporting inter-organizational relationship between airport and supplier of BHS-manufacturer (VS1) of the first transaction can develop under these conditions only with difficulty or not at all. The thus occupied position by the BHS-manufacturer can act as a protective mechanism and enables him to efficiently counteract possible opportunistic behavior of the airport as well as of the integrated sub-suppliers.

7.3.2 Multi-stage customer integration

Contrary to the single-stage CI, multi-stage CI[253] occurs when the external factors of the airport are also available to the supplier of the BHS-manufacturer, whose position is directly prior to the BHS-manufacturer in the value chain. This ensures that the details of the airport are also available to the specific supplier who is involved in the creation of a problem solution for the BHS-manufacturer. In the course of this the airport receives the possibility to interfere in the supply chain of the direct supplier to the airport (BHS-manufacturer) and has the opportunity to coordinate the resolution of a problem over different value stages (Trommen, 2002: 22). This form of CI, which may take various forms and degrees, occurs when the supplier cannot have all the necessary external factors available at the beginning of the transaction.

Thus, there is the option for direct interaction between airport and suppliers or to integrate external factors indirectly in previous value creation processes through the BHS-manufacturer. On one hand, this may have a positive effect on the course of the project impact (e.g. time, cost, matching interfaces, reducing the loss of information, etc.) because of the possibility that the airport discusses the problem solution directly with a specialized supplier. On the other hand, this may lead to a situation where the BHS-manufacturer loses his powerful position and the related options to act. In this case, and compared to the single-stage CI[254], the BHS-manufacturer leaves an advantageous position, in his perspective, to the benefit of the prior positioned supplier and faces the threat of opportunistic behavior from the airport and / or his supplier (e.g. protection by effective governance mechanisms, trustful inter-organizational relationships, etc.[255]).

As an example the renewal of the BHS at Hamburg Airport[256] in 2004 can be used.[257] At the time the industrial motor and gearbox manufacturer Getriebebau

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[253] Cf. Schindler (2007: 42-43) about the general principle.

[254] Cf. Subchapter 7.3.1.

[255] Cf. Subchapters 7.5.2 and 7.6.

[256] Cf. Subchapter 8.4.

[257] Cf. Klesse (2005) and Hamburg Airport (2016). The author of this dissertation was responsible 2002-2006 at Getriebebau Nord (Nord Drive

Nord (Nord Drive Systems) GmbH, which was previously not established in the branche of industry, succeeded in developing a direct dialogue with the airport. By understanding the airport´s needs and requirements in terms of technical support and system availability it established itself as a problem solver for ensuring the core competence of the airport in regard to baggage logistics. As to inter-organizational knowledge transfer, the airport achieved deeper knowledge in regard to industrial motors and drives, so that the industrial motor manufacturer succeeded in the manifestation as the leading brand in the specification of the BHS and the related tender documents. In this course the empowerment of the later BHS-manufacturer was limited and led to a disadvantage for his preferred industrial motor manufacturer SEW Eurodrive, who was the market leader in the branch of industry. The previous example presents that the communication path took place outside the sphere of influence of the BHS-manufacturer, who lost control of the interchanged information and knowledge. This meant that he was not able to reverse the situation in his favor, as the industrial motor manufacturer established an inter-organizational relationship with the airport by means of direct dialogue that was advantageous for both. Figure 11 illustrates the general principle.

Trommen (2002: 22) states that a high degree of CI occurs with a direct integration of the customer[258], while a low customer degree of integration is already available by a simple transfer of information (e.g. control information, quantities, etc.) over several stages of the value chain. Thereby the transfer of information is directly controlled by the airport.

The multi-stage CI is not limited to the two transaction steps presented in Figure 11, but can include more value-added steps in accordance with the design of the achievement creation process. There it is of great importance that the airport not only decides for a BHS-manufacturer. As to the characterization of the external factors that are to be integrated, the airport decides either indirectly or

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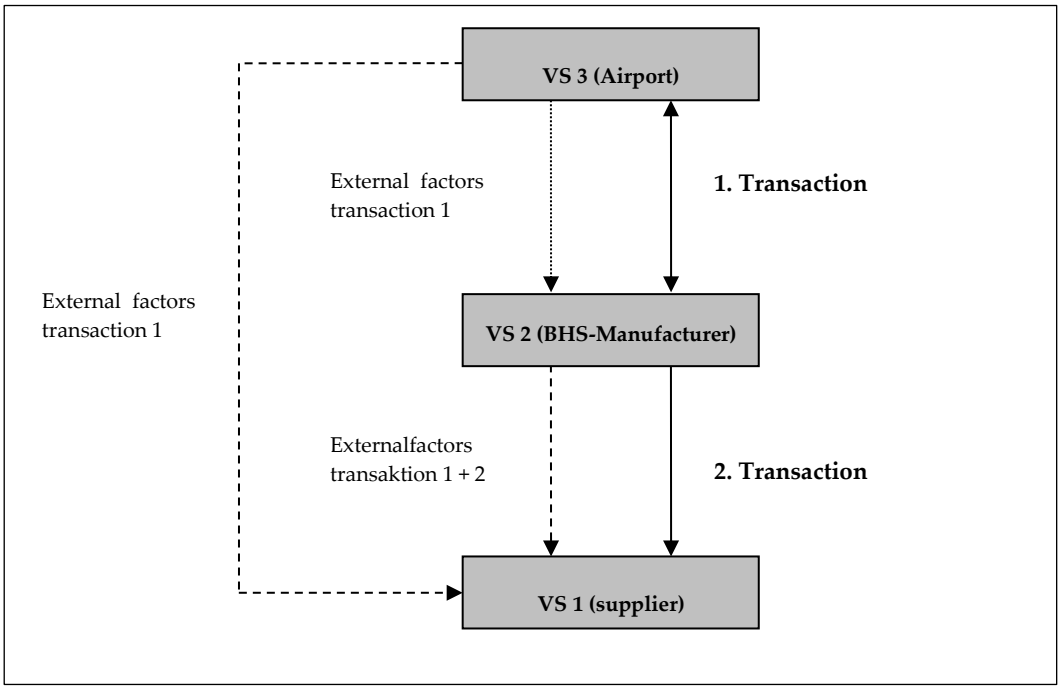
Systems) GmbH as KAM and BDM for the strategical and technical concept and its implementation in the German baggage handling industry.

[258] As in the case of the BHS at Hamburg Airport, CI takes place in a multi-stage constellation. In this course the airport does not act as the direct contractual partner of the BHS-manufacturer.

directly on the suppliers to the manufacturer for the BHS and therefore almost excludes alternative suppliers from the opportunity to participate in the BHS-project.

FIGURE 11: Time sequence of transactions at multi-stage integration



Source: adapted from Trommen (2002: 215); modified

The admissibility of such an action, i.e. the setting of preferences in public procurement procedures according to sector regulations (SektVO) is discussed in more detail in chapter 8. This is even more relevant when the specification of achievement that must be provided to the end customer is designed in a manner so that only preferred suppliers can meet the requirements. For example, this is of special importance in public procurement where the BHS-manufacturer has to mention his value chain partners in advance of the award with nearly no chance to change them later on.

Compared with the single-stage CI, the case of the multi-stage CI, due to the external factors of the airport and the BHS-manufacturer, develops a complex

transaction (Trommen 1999: 9-10), which can have an impact on the previously established market position. Due to the fact that the external factors of the airport must be available first, these determine the order of transactions (Trommen, 1999: 9-10).

This also means that the BHS-manufacturer is possibly able to select suitable partners if he has gained knowledge about the problem to be solved. The speed and accuracy with which this selection takes place can mean a CA for the BHS-manufacturer in the ex-ante phase of the award of the contract. This means that in a possible later execution of the BHS-project, the achievement capabilities and problem solving skills of the available potential suppliers are limited due to their limited number. Therefore, the BHS-manufacturer having early access to information enables him to make decisions about future transaction steps at an early stage. This can result in a CA to his benefit.[259]

According to Trommen (1999: 216), highly customer-specific partial achievements, which result in a high dependency of the BHS-manufacturer of the achievement specification of the airport, were procured by the manufacturers usually only during the achievement creation process and not already in the context of the creation of a potential. As Trommen (1999: 216) argues, in the case of a non-acceptance of the achievement by the airport it could lack on a alternative possibility to use the achievement. Trommen (1999: 216) understandably concludes that an effective protection mechanism to avoid failure is a top-down definition that means to define the overall achievement prior to the partial achievement. Therefore, BHS are airport-specific order-related and manufactured based on a customer's specifications.[260]

7.4 LEAD USER-CONCEPT AS A THEORETICAL APPROACH

With its proliferation in the B2B sector (Kunz and Mangold, 2003: 14), the Lead User (LU) approach[261] of Erich von Hippel is the most popular method of early customer involvement (Wecht, 2006: 18). In the context of this topic the

[259] Cf. Subchapter 7.3.

[260] Cf. Chapter 8.

[261] Cf. Schindler (2007: 44-46) regarding general aspects of the approach.

airport is the user of a BHS. According to Nagel (1995: 9) a user can be located at any point on a value chain of any length. In general von Hippel (1986: 796) distinguishes between users and LUs and characterizes LUs as those whose current product requirements reflect the future main needs of the entire customer spectrum of the branch of industry. Thus, they are able to identify specific market needs before they are generally available in the market (von Hippel, 1986: 796). Therefore, LUs are able to secure an advantageous market position as pioneers or first movers (Nagel, 1995: 6), so that they can profit from product design that to a large extent meets the (future) needs of these products (Nagel, 1995: 5). Von Hippel (1986: 796-797) found out that the involvement of LUs in product development makes for a greater degree of novelty, higher sales volumes and a greater market acceptance; moreover, customer needs can be better covered by the developed products (Herstatt and von Hippel, 1992: 213).

Positive involvement of accepted LUs in the market can act as a business supporting reference for the manufacturer of a BHS, differentiate the BHS-manufacturer from the competition, and be a CA for the system manufacturer. Due to their leading roles in the market of innovative solutions, LUs are more willing to implement than their competitors (Kunz and Mangold, 2003: 14), which can provide manufacturers of BHS with the possibility to position themselves early by identifying and customizing relevant products.

Wecht (2006: 18) describes the selection and integration of lead users as a multi-step process. It begins with the identification of new trends and product opportunities in the market, which is followed by the selection of the appropriate LUs. However, BHS-manufacturers can define LUs according to certain airport-specific parameters (e.g. the total number of passengers or transfer passengers, growth rates, etc.)[262]. In the further course information about customer needs in cooperation with the LU and employees of the manufacturer will be collected, which is intended to draw up the first proposals for solutions and product concepts.

Kunz and Mangold, 2003: 15) argue that LU are highly qualified for innovative activities, and very well suited for the integration into innovation and development processes, because they do not have to be motivated in addition to

[262] Cf. chapter 8 (Tab. 19).

the joint work, and the benefit of their contribution is very high. This can have a positive impact in the context of concept plans, the joint development of customized BHS modules and in optimizing the logistical process of luggage handling and the overall achievement process.

Lilien et al. (2002: 1042-1043) argue that the LU-approach can be connected to certain conditions with considerable costs. This is justified by the fact that on the one hand, many branches of industries only consist of small customer groups, like the group of German airports, and on the other hand the identification and recruitment process is cost intensive. Due to the relatively small group of customers and unique identification parameters the effort for the identification of LUs in the baggage handling industry will turn out to be relatively low.

For a successful participation of the LU on CI-processes, it is necessary to create the appropriate framework conditions (Morrison et al., 2000: 1513-1514). To what extent this framework can be designed and how this can affect the adjustment of production processes within the value chain (von Hippel, 2001: 247-248) may depend of the achievement potential of the integration partner and the legal framework.[263]

Because of this and the lack of cross-industry generality of this approach Kunz and Mangold (2003: 16) recommend to limit the risk in selecting LUs through the supplier firms to ensure that the potential integration partner already has a high product involvement and a deep object related knowledge, and that the industry is connected with strong development potential and in general manageable. This is necessary because it cannot always be assumed that the needs of LUs actually reflect the needs of future customers in the industry.

Therefore, a BHS-manufacturer cannot assume that the customer-specific problem solution can also be applicable to other customers in the industry, because the problem to be solved by the BHS-manuafacturer may be a different one. The segmentation of customers in LU is successfully practiced in some industries (e.g. automotive industry) on a daily basis. However, the unilateral focus of the concept does not justify the total potential of CI.

[263] Cf. Subchapter 8.6.

According to Kunz and Mangold (2003: 16) this is on the one hand due to a lack of involvement of the concept-specific costs; on the other hand there may also be other profitable customer segments for the innovation and integration process. This can be recognized by the fact that modules and subsystems of a BHS are more or less modified in order to solve logistical tasks outside of baggage logistics processes (e.g. parcel logistics, food logistics, etc.).

7.5 STRATEGIC FUNDAMENTALS

7.5.1 Strategic fundamentals for success

The most important strategic fundamentals for success of the CI can be summarized in the following areas according to Wecht (2006: 41-42): manufacturer-internal basics, Ccstomer-related basics and basics of the integration process. The following table presents a brief overview of the strategic fundamentals of the integration processes.

Related to the manufacturer-internal fundamentals, Wecht argues (2006: 41-42) that the focus there is on the accordance of the integration of customers with the strategy of the BHS-manuafcturer. That means the manufacturer of a BHS must be able to accept the creation of achievement contributions by the airport integration partner. Therefore, it is a fundamental requirement that the BHS-manufacturer is able to develop an understanding of the customer's requirements and needs. To make this easier, an interface positioned on the manufacturer's side ensures that the customer's requirements are aligned with the BHS-manufacturer´s possibilities. Therefore it is possible that the BHS-manufacturer has to adjust existing internal structures and processes as well as intra-organizational learning processes.

Typical fundamentals related to the customer are especially size of the customer in relation to other customers, the customer´s financial attractiveness, and its market-relevant reputation. That means that a LU can be a potential reference customer[264] for the BHS-manufacturer. In the airport industry and related to baggage handling this is usually achieved by the number of total

[264] Cf. Subchapter 7.4.

passengers as well as the number of transfer passengers. The actionable CI-related knowledge, the capabilities and the motivation to integrate as well as the experiences gained with the airport represent more customized success fundamentals.

TABLE 15: Strategic fundamentals of the customer integration

Manufacturer-internal fundamentals	**Customer-related fundamentals**	**Integration process related fundamentals**
- Consistency with the strategy - Understanding the needs - Interface between R&D and marketing - Organizational learning process	- Relative size - Financial attractivity - Reputation - Knowledge, capabilities, and skills - Motivation - Past experiences	- Compatibility of cultures - Development of clear objectives - Matching structures - Form of incorporation - Relationship variables - Communication - Spatial dimension - Controlling and auditing

Source: adapted from Wecht (2006: 42)

Related to the fundamentals of the integration process, the compatibility of the cultures of the firms, especially concerning the goals, values and management procedures are of special importance, because both the BHS-manufacturer and the airport focus on achieving the same goal: finishing the BHS with the start of operations at a certain point in time. This clear objective follows detailed bilateral project planning, which is also responsible for the development of appropriate project-specific organizational structures and their integration into the processes of the firms. In this context relationship variables are of crucial importance, as

well as intra- and inter-organizational communication, spatial dimension and controlling and auditing the integration processes.

7.5.2 Fundamental key factors

The relationship variables[265] commitment and trust are the basic key factors for effective relationships between the integration partners in CI-processes. If both are present, integration partners can achieve results through matched and coordinated joint activities that might otherwise not be achieved (Morgan and Hunt, 1994: 20). Littler and Leverick (1995: 16-17) argue that the establishment of trust between integration partners is often the result of communication with the right contact partners, the belief in reliability and integrity, combined with consistency, competence, honesty, fairness, responsibility, helpfulness and altruism of the other partner.

It is this task, namely the formation of trust to the respective contact partners, that is of crucial importance in the acquisition of BHS projects. Because is a BHS-project once awarded in a public tender, both partners (airport and BHS-manufacturer) are bound to each other and the transaction-specific connection between them can only be solved with considerable costs. Also alternatively partners would no longer be willing to carry out the transaction on the same terms and contract conditions as those under which the award for the previous manufacturer was originally issued.

The alternative BHS-manufacturers could be willing to be paid for the risk associated with the solution of the original manufacturer (e.g. for taking over already installed achievement contributions of the original manufacturer). Based on the tender regulation that supports product homogeneity it is crucial that this confidence is created on the basis of intangible assets in the preliminary phase of the procurement. Therefore, in contrast to the general statement by Stotko (2005: 115)[266] the sales of the BHS-manufacturer does not take over a "oberflächliche"[267]

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[265] Cf. Subchapters 10.4-10.7 that discuss the relationship variables in the course of the empirical investigation in more detail. See also Subchapters 11.1 and 11.2.

[266] Cf. Subchapter 7.2.3.

(Stotko, 2005: 115) task in this specific branch of industry, but in fact takes on the important and crucial task of building confidence between the actors, and its transfer to the achievement capabilities of the BHS-manufacturer and the related partners.

Rindfleisch and Moorman (2001: 1) argue that trust is thereby created by the call for interaction between the staff of the BHS-manufacturer and the airport to integrate by building strong interpersonal relationships. Interpersonal relationships support the exchange of information between the involved parties and involve them more strongly in the integration process, which reduces the uncertainty of opportunistic behavior (Rindfleisch and Moorman, 2001: 1).

Frey (1991: 46) also sees people as the crucial factor for successful CI-processes, and recommends to motivate and to support those actors on the sides of the airport and the BHS-manufacturer who are able to get project support and overcome problems and obstacles, and to drive a CI-project successfully by means of by own initiative motivated power. Due to this, intangible assets and the development of inter-organizational and interpersonal relations in the context of CI-projects are of outstanding importance and crucial for the success of CI-projects and the generation of CAs.[268]

7.6 GUIDELINES AS SUCCESS FACTORS

Guidelines may be required as part of CI-processes as a basis for the design of inter-organizational relationships between integration partners. Zernott (2004: 65) argues that guidelines to success have to be designed so that BHS-manufacturers are able to consider current problems in the baggage handling industry as well as the future needs and requirements of the airports. If the CI-partner accepts the guidelines bilaterally, they may possibly be a barrier against opportunistic behavior of a partner; a violation of the guidelines would be early identified and inevitably lead to protective measures.

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[267] Translation from GER according to Stotko (2005: 115): “superficial”.

[268] Wecht (2006: 23) subsumes inter-organizational interactions between interaction partners under the term relationship management.

Zernott (2004: 65) states that the guidelines as part of CI-processes are process and value-oriented and provide approaches for the temporal integration of customers and the methodology for the selection and integration of customers, and represent the framework for the integration of customers in the development of highly customized products in the B2B-sector.

7.6.1 Process orientation

According to Zernott (2004: 65), a process can „(…) als räumliche und zeitliche Transformation eines Objektes durch das Zusammenwirken von Personen, Produktionseinrichtungen, Material und Verfahren definiert werden, die losgelöst von funktionalen und periodischen Strukturen verläuft“[269]. Hinterhuber (1994: 60) argues that thereby occurring processes within firms represent a bundle of activities, so that each of these activity bundles consist of completed fulfillment operations which are logically related to another, and whose measurement is based on certain parameters such as time, cost, quality and quantity. Droege and Eger (1998: 96) refer to the dynamics in B2B-markets that forces firms to high flexibility in creating their achievements and in the use of their resources. In order to achieve the expected product success and objectives in terms of time, cost, quality and sustainable market success, firms are forced to organize their organizational processes according to the development of products based on R&D processes (Droege and Eger, 1998: 96). Hence, the development of a product can already begin in a very early stage of the process, i.e. already in the context of the sales acquisition of the airport. The development of a customized BHS-solution occurs in advance of an invitation to tender, and a development of customized solutions related to the airport´s logistical problem occurs more or less together with the airport and a later integration of such a solution into the tender documents. In this case the successful integration of the airport represents an intangible asset that may consist of the developed customer confidence in the

[269] Translation from GER according to Zernott (2004: 65): “(...) can be defined as spatial and temporal transformation of an object through the interaction of people, production equipment, material and processes, which run separately from functional and periodic structures".

achievement capabilities of the BHS-manufacture, and in the identification of the airport with the common developed logistical problem solution. This, and the knowledge of the opportunities and risks of the common developed problem solving solution, can lead to an advantageous position for the BHS-manufacturer in the context of the process to provide an offer for the system. If the customer is involved in the process of product development, it is possible that the airport penetrates the organization of the BHS-manufacturer, depending on the level of intensity of the CI, so that the airport will be like an employee in the process of the product development (Zernott 2004: 66; Kurzmann and Reinecke, 2009: 193-212).[270] This can cause the airport to also defend a jointly developed solution against alternative solutions that have been developed without its involvement.

Zernott (2004: 66) argues that depending on the scale and the intensity of the customer involvement and the complexity of the B2B-product that is to be developed, it is necessary to also synchronize all processes, to involve the customer as early as possible in the development of the product, and to ensure an efficient transfer of know-how through the installation of appropriate interfaces. In coordination and decision-making processes possibly occurring friction and feedback effects, losses of information and double work need to be avoided (Zernott 2004: 66).

7.6.2 Avoidance of dissipation

The target oriented use of resources and the associated avoidance of dissipation are connected in the literature with the general question of whether the relevant activities of firms and their results, e.g. in developing industrial B2B-products are value-adding, non-value adding or wasteful (Wildemann, 1996: 17-18). Wildemann (1996: 17-18) argues that value-adding character can be understood as all manufacturing activities that create additional value to the customer and lead to an increasing willingness of the customer to reward the achieved added value. An example may be the adaptation of a BHS during the manufacturing or installation process on site. For example, technical advancements and adaptations which are possibly developed together with the

[270] Cf. Subchapter 7.1 (Tab. 12).

airport, and promise improved solutions to the logistical problem compared to the original design, could be rewarded by the airport. In comparison, Wildemann (1996: 17-18) describes those activities that lead to dissipation as having no value-adding character. For example, this can be repeated information gathering activities due to not finally defined project responsibilities or interfaces, feedback or adjustment loops due to ucertainties related to specifications, etc. It is pointed out that activities of a wasteful character must be distinguished from activities that are essential for the preparation of achievement creation but lead to no added value (e.g. bills of materials, work instructions with the purpose to prepare for the manufactue, etc.).

Capital goods are usually purchased in the context of achieving a solution by their application to clearly defined problems; therefore it is necessary that the BHS-manufacturer achieves knowledge of the specific requirements and problems of the airport and translates this into clearly defined and product-related design features. This can be done by a BHS-manufacturer in the short-term by market research, in the long term by anticipating customer requirements, but this is associated with investments in concentrating on applications and tasks related to baggage handling logistics. The problem of defining the customer value increases, the more time it takes to develop the complete BHS-system or its components. If the benefits for the airport are defined, that results in the need for identification and integration of the customer with an appropriate technological perspective (e.g. LU) so that the applied methods of CI also enable control of the value-added processes and, in addition, result in access to the accumulated knowledge of potential customers (Zernott, 2004: 68).

7.6.3 Early acquisition of information and knowledge

It is crucial to the success of the products that the manufacturer of a BHS is capable of achieving the required quality and responding to the specified requirements in the short term, at a price level that is accepted by the airport. Zernot (2004: 69) argues accordingly that with increasing degrees of technological complexity and customization and with decreasing degrees of procedural and methodological design of the integration processes, it will be more difficult for the BHS-manufacturers to fulfill this task.

An effective counteraction can possibly be achieved if the system specification for a new BHS is concretely defined at an early stage, so that necessary adaptations can be implemented in order to meet the requirements of the airport even better with minimal effort. However, this requires from the airport[271] and the BHS-manufacturer to anticipate such developments that are of structural and technical importance, and also activities related to the availability of the needed resources.[272]

Wildemann (1993: 27-28) argues that it is useful to let inter-organizational information processes take place as early as possible by the application of suitable methods and procedures, because much project-related information may occur only in the progressive course of a BHS-project.[273] Zernott (2004: 69) argues about the need for short control loops for the definition of problem solving space as early as possible, and also the implementation of a target-actual comparision in terms of the customer´s requirements, and suggested solutions including, if necessary, the optimization of the communication flows on interfaces.

7.6.4 Increase of deterministic process shares

Processes for developing new products are characterized by stochastical and determining sub-processes. Deviations from the project budget or the schedule, which are possible in projects where an integration of the BHS in the overall system of the airport takes place, lead to the necessity of increasing the share of deterministic sub-processes. This begins already in the tender phase of a

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[271] For example, the knowledge about the total number of passengers, transfer passengers, average size and structure of baggage, minimum transfer time, etc.

[272] Cf. Subchapter 4.2.1 about resources and capabilities.

[273] For example, a dialogue can take place during the time-limited offer phase between the BHS-manufacturers and the airport, where relevant project-related questions in order to prepare the quotation can be asked and answered. Questions and answers will be simultaneously made available by the airport to all potential BHS-manufacturers participating in the tender (cf. Subchapter 8.6.4; §97 (1), (2) GWB).

publicly advertised BHS-project as the time for the submission of an offer is limited, and a breach (e.g. lack of access to information and lack of inter-organizational communication, etc.) generally leads to the exclusion of the firm from the tender. Therefore, it is necessary that deterministic sub-processes are based on comprehensive, complete and valid information and transparency about the relationships of the variables influencing the innovation process. Intangible relation-specific variables, like trust and commitment, play an important and crucial role in this context.[274]

Seidel (1996: 45-46) argues that in order to achieve a contradiction-free concept for a product, a problem must be clearly structured at the beginning of a development phase and sub-tasks must be derived. Zernott (2004: 70) points out that if the objectives between the integration partners are coordinated and agreed (e.g. by means of a performance specification for the BHS-system to be created) at an early point in time, the partners are able to ensure the necessary transparency. Different perspectives[275] of the objectives of the BHS-manufacturer were homogenized by the airport in the framework of the system specification for integrated BoM in the request for a quotation, so that deviations from the specification, which can lead to the exclusion from the process, are prevented and the airport receives technically comparable quotations. The BHS-manufacturer submits to this compulsion in favor of the perception of a project opportunity and can try, if necessary after receiving the award, to implement a different perspective in the formulation of objectives and to adapt it in consultation with the airport.

7.6.5 Increase of process awareness

It is an essential success factor of the CI to exclude the uncertainty that customers may have about the payable contributions (Fließ, 1996: 92-93) expected by the BHS-manufacturer in a CI-project. Therefore, Fließ (1996: 92-93) points out that the necessary process awareness offers the customer the transparency to know at what time, to what extent, and at what points and stages of the process

[274] Cf. chapter 5 and Subchapter 7.5.2.

[275] Cf. Subchapter 7.6.2.

customer contributions are needed (e.g. experience based knowledge, best-practice ideas, etc.). Fließ (1996: 92-93) argues that in this case a necessary precondition is that the customer can obtain process awareness and evidence if the manufacturer as the offering firm and integration partner is aware of the intensity of the CI.

In addition, it is necessary to foster the customer's awareness that his achievement contribution (e.g. the quality of the system specification and tender documents, information on airport-specific circumstances, etc.[276]) will affect the quality of the project result as well as the duration of the product development process and the associated project cost. The aim is that the airport develops a certain degree of process awareness, which will place it in a position to assess the own achievements or classify and help it to overcome barriers. Therefore it may be necessary that the BHS-manufacturers invest at an early stage in an inter-organizational relationship with the airport (e.g. LU) and supports the airport in obtaining process awareness.

Consequently, the manufacturer of the BHS is required to exclude substantive and methodological deficits in the development of knowledge of the airport that is to be integrated. To achieve this, and to ensure the timely provision of the achievement contributions of the integration partners, the BHS-manufacturer must ensure that the CI-methods are applied systematically and based on comprehensible and clear rules for all participants (Fließ, 1996: 94).

7.6.6 Integrativity

The term integrativity is characterized by Zernott (2004: 72) as follows: „Integrativität ist Ausdruck des grundlegenden Wandels in den Auffassungen zur Handhabung von Geschäftsbeziehungen".[277] Engelhardt and Freiling (1995: 37) state that in the capital goods sector, there are suppliers and buyers who have a specific, extremely tight and sometimes very strongly aligned relationship to each other. Therefore, instead of individual transactions, relationships are in the

[276] Cf. chapter 8.

[277] Translation from GER according to Zernott (2004: 72): "Integrativity is an expression of the fundamental change in the views on the handling of business".

foreground that are motivated by value-related excessively high negotiation volumes and by the need for cooperative management of complex transaction situations (Engelhardt and Freiling, 1995: 37). This motivation may be traced back to the own resources of the firm providing a BHS-solution and to the airport, due to the recognition of the attainment of a bilateral (competitive) advantage[278] by combining or bundling these resources to achievement packages or bundles[279] and its combination with relationship variables[280]. Due to the integration both partners may achieve an advantage: the BHS-manufacturer can hope for the integration of the problem solution that was developed together with the airport into the tender documents, while the airport can minimize its planning and problem solving risk because the found solution promises to solve the specific problem, and can position the airport in the competitive field of commercial airports with an improved service portfolio.

In consequence the investments of both integration partners leads to relation-specific assets, lower value chain costs, fewer failures and defects and faster product development, resulting in relation-specific rents.[281] From the achievement dimensions presented in Subchapter 7.2.1 result the binding potential of the integrativity. Engelhardt and Freiling (1995: 40-41) emphasize the special relevance of process integrativity within CI. Its determining factors are the dimensions engagement depth, engagement intensity and engagement duration. The timing of the customer involvement in development processes is described by the dimension of depth of engagement. The depth of engagement of the airport in the development process of a BHS can vary widely and depends on the know-how and capabilities of the airport, as well as on the willingness of the BHS-manufacturer to permit a certain and if applicable a maximum level of integration. With regard to the timing of the engagement, which is described by Engelhardt and Freiling (1995: 40-41) as the exact timing of the integration of resources, its maximum can usually take place after a contract award.

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[278] Cf. chapter 2.

[279] Cf. Subchapters 7.1.2 and 7.2.1.

[280] Cf. Subchapter 7.5.2 related to relationship variables.

[281] Cf. Subchapter 5.3.1; Dyer and Singh (1998: 663-664).

With respect to the special conditions in the field of BHS and the related product homogeneity, it is possible that this may differ from the description by Engelhardt and Freiling.[282] That means if this takes place prior to the tender, or in advance of the tender award, all other potential BHS-manufacturers are at a competitive disadvantage, which in consequence makes the purpose of the tender questionable at the very least.[283] Finally, the engagement intensity is crucial for the preparation of the external factors and provides information about the scope of integrative processes.

7.7 CUSTOMER INTEGRATION COMPARED WITH OTHER FORMS OF CUSTOMER BINDING

Under the term customer involvement Wecht (2006: 35) understands „(…) alle Aktivitäten eines Herstellers, die zu einer Beeinflussung des Entwicklungs- bzw. Innovationsprozesses durch Wissen über sowie von Kunden oder durch direkte Kundenbeiträge im Rahmen gemeinsamer Aktivitäten führen".[284] Wecht (2006: 35-36) mentions as possible forms the observation, participation and integration of customers, which will be presented in Tables 16a and 16b in relation to each other and briefly discussed in the following.

With the purpose to achieve a better understanding of the market and thus to obtain better guidelines and specifications for a solution or product development, observation is connected with the least activity and a more passive role of the customer, and the loyalty of the customer can only be secured by the implementation of customer loyalty programs (Wecht, 2006: 35-36).

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[282] Cf. chapter 10, especially the result of the empirical investigation presented in Subchapter 11.1.

[283] Cf. Subchapter 8.6.

[284] Translation from GER according to Wecht (2006: 35): "(…) all activities of a manufacturer, which lead to an influence on the development and innovation process through knowledge of and by customers or by direct customer contributions for joint activities".

TABLE 16a: Comparision of possible forms of customer involvement in the early phase of innovation, part 1

	Customer observation	**Customer participation**	**Customer integration**
General principle	The more a firm knows about its customer, the better the firm can develop for the customer	Because of the wish of the customer is the highest development goal, it is necessary to ask the customer directly about his needs.	Activation of tacit knowledge and hidden needs by an opening of the innovation process for the customer
Basic principle	Collection of data about customer requirements and buyer´s behavior	Customer requests, -needs and preferences are queried directly	Customers as co-developers and the full use of their knowledge potential
Goals	Better understanding of the market, development of a clear picture about the key customer	To hear the voice of the customer, to explore hidden needs of the customer by consideration of the use of the product	Creation of shared value by cooperation with the customer
Sources to get information	Database, sales data	Interviews, surveys, audio and video recordings	Knowledge, creativity, experience of the customer
Role of the customer	Passive role; receiver of the product	Passive, but important role as source of information	Active role; partner in the value chain

Source: adapted from Wecht (2006: 37); modified

TABLE 16b: Comparision of possible forms of customer involvement in the early phase of innovation, part 2

	Customer observation	**Customer participation**	**Customer integration**
Role of the manufacturer	Trying to achieve customer loyalty	Section of suitable customers and, if advantageous, building long term relationships	Changing the customer role requires new and open understanding of the roles
Weaknesses	Indirectly information with the threat of misinterpretation	Experience horizons of the average customer is limited	Risk of loss of competence of the manufacturer
Strengths	Understanding about the past customer behavior	Exact product development; increased customer loyalty	Better and innovative products with shorter time-to-market; increased cusotmer loyalty through the active role of the customer

Source: adapted from Wecht (2006: 37); modified

Participation is characterized by a higher degree of customer involvement. The goal is to let the customer participate in surveys, interviews or application studies and in this way obtain the desired and relevant information. The information gained can be used by the BHS-manufacturer to assess his position in the market and the opportunities and risks associated with the participation in relevant baggage logistics tendering procedures. The initiative in this case is on the manufacturer's side, while the airport takes an inactive role in the process, which leads to the acting parties not entering into a real and active partnership.

Contrary to observation and participation, in the context of CI the customer takes an active role in the process. Here the goal is to activate the knowledge potential of the airport and to allow it an integrative role related to the

relationship modality (e.g. as a co-developer in the process of developing a solution to solve the airport´s problem).[285] However, this can be done prior to tender, during the development of a BHS-concept, but also even after the award of the contract, especially in the context of project management. If necessary the airport as a customer can take over certain achievement shares that are not directly related to the internal production processes of the BHS-manufacturer.

For example, this can be the take-over or active support of achievement shares that involve actively supporting or accepting peripheral systems, in order to limit the risk connected with the integration of a BHS.[286]

This results in a common value creation with the airport and increased customer satisfaction, which also leads to expecting customer loyalty to the manufacturer of the BHS as well as a reduction in the risk for the investment to fail.

7.8 CHANCES AND RISKS

In the context of CI different opportunities and risks arise for the parties. The high potential of customer loyalty may represent an opportunity for the manufacturer of a BHS. It may provide the manufacturer with an opportunity to set himself apart from competitors in the market and to achieve a CA. At the time of the integration project, the targeted contribution of resources by the manufacturer and the airport,[287] as well as the cooperation enables the integration partners to build bilateral confidence and trust and creates conditions for a strong and sustainable inter-organizational relationship.

A reliable and sustainable inter-organizational relationship, based on bilateral trust, is as intangible asset and the basis for the achievement of CA and

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[285] Cf. Subchapter 7.1 (Tab. 12).

[286] For example, this can affect the master-level controllers of the IT-system, programming tasks, electrification tasks, the provision of necessary building constructions in the project, etc.

[287] Cf. Subchapters 7.1.2 and 7.2.1.

supernormal relational rents.[288] Integration projects provide the parties with the chance to increase their market-specific references and their image through the use of achievement bundles, specifically adapted to the solution of the logistic baggage handling problem of the integration partner, and through possibly resulting application-specific developments, to establish themselves as first mover or technology driver and to generate a CA in the field of BHS.[289] This results in opportunities which are connected with the expansion and optimization of the provided achievements and the development of customer satisfaction. The cooperative solution of complex tasks and the advancement of knowledge processes[290] create the basis for the division of labor between the partners, who have the opportunity to focus on their firm-specific core competencies[291] and possibly outsource costly resources. The additionally acquired know-how and knowledge provides the other integration partner with the opportunity to stand out from the competition and to succeed in the market. This unevenly distributed resource represents an intangible asset that is the basis for the achievement of CAs (Zimmer, 1999: 112-123).[292] This is particularly important in markets that are characterized by product homogeneity in order to achieve CAs.

CI also includes risks arising partly from the options above. Thus, by the two-sided know-how and knowledge-sharing, enhanced bilateral dependence of the integration partner may occur.[293] For example, the deeper the airport gets insight into the achievement processes of the BHS-manufacturer, the more the airport is able to move the manufacturer in a position to take over additional achievement contributions or price reductions. To assess the achievement capacity of the BHS-manufacturer the airport requires information depending on

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[288] Cf. Subchapter 4.4 related to the characteristics of resources and sustainable success in competition.

[289] Cf. Subchapter 4.3.3 related to the immobility of resources. See also in detail Barney (1986b: 1233-1234) and Zimmer (1999: 112-113).

[290] Cf. Subchapter 7.6.3.

[291] Cf. Subchapter 4.2.1 related to resources and capabilities.

[292] Cf. Subchapter 4.2.2 related to core competencies and cooperation and Subchapter 4.3.3 related to the immobility of resources.

[293] Cf. Subchapter 5.3.1 related to relation-specific assets.

the scope of the project in accordance with the regulations in §20 SektVO and §21 SektVO (e.g. overhead costs, material costs, number of employees who will perform the manufacturing / installation of the BHS, etc.).[294]

By means of the received transparency in the achievement creation of the manufacturer of the BHS (at multi-stage CI down to the manufacturer´s subcontractors) the airport may develop requests for price reductions or to take over additional achievement contributions. In this course arises an encroachment in the internal achievement creation process of the BHS-manufacturer which possibly can result in the necessity to reconfigure the achievement creation processes.

Basically, in the context of CI there is a risk related to high performance transparency, namely that the customer changes from external procurement of achievements to in-house manufacturing, or enters the market as a competitor of the former integration partner. However, due to the different core competencies of the BHS-manuafacturer and the airport[295], the airport would usally not have the necessary resources to manufacture a BHS, so that the option of an in-house production of a BHS or a market entry as a competitor can be exluded.

The procurement and the development of non-existent or weak resources and conditions that are needed for the integration project can lead to delays of the project progress, loss of flexibility, high coordination effort at interfaces and in consequence to costly burdens on the integration partner.

An increase in the achievement result originally planned in the CI-project can have a negative effect on the success of the integration project and can lead to a failure of the integration project. Specifically in the context of multi-stage CI without the corresponding early installation of safeguards[296] for the BHS-manufacturer, he faces an increased risk of opportunistic behavior of the airport and the sub-supplier who is postioned in the first stage of the transaction, if both

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[294] Cf. Subchapter 8.6.

[295] Cf. Subchapter 4.2.2. Duschek (2001: 59) indicates the presence of core competencies as a central source for the generation of CAs.

[296] Cf. Subchapter 5.3.1.1.

exclude the BHS-manufacturer completely or partially by direct communication.[297]

Therefore, the gained information advantages can be used in the project for an early implementation of own opportunistic interests. The risk of opportunistic behavior, connected with a breach of trust and a lack of openness, can damage the relationship of the parties of the CI-project. Furthermore, it can lead to a loss of competence and reputation and to failure of the integration project and the business relationship between the parties and thus a loss of the incurred investments into the inter-organizational relationship between the BHS-manufacturer and the airport.[298]

7.9 CUSTOMER INTEGRATION IN THE FURTHER COURSE OF THE DISSERTATION

In the further course of the dissertation chapter 10 deals with CI, based on German manufacturers of BHS.

Based on an qualitative empirical study among German manufacturers and their customers (airports), the possibilities are investigated to achieve CAs by CI to the benefit of the BHS-manufacturer in the market for BHS and their customers.

The results of this investigation were finally discussed and summarized in chapter 11.

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[297] Cf. Subchapter 5.3.2.2.

[298] Cf. Subchapter 5.3.4.

8 FRAMEWORK CONDITIONS

The next chapter provides an overview of specific airport logistic processes and framework conditions in preparation of the qualitative empirical investigation, with a view to develop an understanding of the complexity of the product and its integration into complex coordinated logistic processes. In this context the chapter also presents the basic tasks of airports, their classification, and a classification of BHS within airport logistics. In the further course the chapter deals with the basic principles of the handling of passenger baggage. Starting from the process steps of the baggage handling at airports, the chapter consideres essential components of baggage logistics and selects methods of passenger baggage transportation and system interfaces to peripheral core processes of airport logistics.

In addition to the discussion on the essential requirements for BHS, the presentation of the basic legal framework for public procurement constitutes a second focus of the chapter. That focus is mainly on the conditions for the participation of BHS-manufacturers in tenders, the evaluation of tenders, and the tendering methods. In the further course the chapter considers the obligation to provide information to BHS-manufacturers and the conclusion of procurement procedures. The chapter concludes with an opportunity and risk assessment for BHS-manufacturers.

8.1 INTRODUCTORY FUNDAMENTAL AND DEMARCATION

Commercial air transport[299], which represents a portion of the aviation industry, is crucial for an economy from a political and economic perspective, because especially in the context of globalization it is necessary to provide

[299] Commercial air transport operation is an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire (ICAO, 2009) including the related direct and indirect service achievements (Sterzenbach and Conrady, 2003: 3; Mensen, 2003: 3).

economic transport services in the shortest possible time. In this case, the fulfillment of mobility and transport needs has a positive effect on the income or employment of the economy (Mensen, 2003: 8-9). The necessary infrastructure is particularly displayed on airfields that mark the respective starting and end point for air traffic movements. The eligibility and operational requirements at the national and international levels are regulated and monitored by organizations.[300]

In order to compare the facilities of international airports, they are divided into classifications. Due to different classification fundamentals the literature presents different approaches to classify airports. The Airport Council International (ACI) classifies airports in general according to their function within the air traffic network and the annual capacity to handle passengers and aircrafts. This classification is presented in Table 17 and used in the further course of the investigation.

The International Civil Aviation Organization (ICAO) classifies airports on the length of runways, application possibilities of aircraft with regard to the chassis width, as well as safety and rescue measures (ICAO, 2004).

The German law § 6 LuftVG and the §38 LuftVZO divides airports more specifically into: airports, traffic airports, special airports, landing spots, traffic landing spots, special landing spots, and wind gliding areas. In the year 2011 61 airports were listed in Germany (ADV, 2011); thereof 60 are still in operation. The list of German airports covers main landing spots as well as regional and German international airports. Thereof the ADV defined 24 airports as most important for the German air traffic, whereof 23 are still in operation[301] (ADV, 2011).

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[300] On national level: BMVBS, LBA, DFS, ADV and on international level: ICAO, IATA (Pompl, 2002: 13-14).

[301] The Airport Berlin-Tempelhof is out of operation and closed since 30.10.2008 after achieving annual losses of EUR 10-15 million (Spiegel online, 2008, October 30).

TABLE 17: Airport classification

Classification	Passengers p.a.	Traffic share		Handled aircrafts	Expected growth p.a.
		Transfer	Low cost		
Major Hub	>25mill.	high	small	A380; A350	3-5%
Secondary Hub	10-25mill.	medium	growing	B757, A350	4-7%
Regional Airports	5-10mill.	limited	up to 50%	narrow body	5%
Small Regional Airports	<5mill.	none		narrow body	7-11%

Source: adapted from ICAO (1999); modified

The economic and financial crisis that started in 2008 has reinforced the competitive pressure on airports, so that competition will also increase externally as airports will need to attract a growing share of passengers (SITA, 2011a: 4). Notwithstanding the global crisis, demand for air services is expected to double by the year 2030, so that airports face several main challenges in order to be prepared for the future needs: One of the most important is to solve the lack of capacity by the right positioning strategy (SITA, 2011a: 5). This means that the airport business operates in the same way as other competitive enterprises: attracting and winning customers, and delivering a return to shareholders through operational and economic efficiency (SITA, 2011a: 6).

The focus of this investigation is on the question of how CI for German BHS-manufacturers can be a means of achieving CA. Therefore, the following considerations refer to German airports as customers for BHS. Furthermore, the consideration in this dissertation has its focus on airports listed by the ADV and selects airports in accordance with their passenger traffic.

8.2 PASSENGER AIR TRAFFIC IN GERMANY

The following table presents the monthly changes in passenger numbers of all German airports in the period 2010-2014. The values given are in each case in relation to the previous year and include incoming, departing and transit passengers inclusive of transfer passengers. Transit passengers are defined by the ADV (2014) as „Fluggäste, die innerhalb einer Flugstrecke (Flug unter gleicher Flugnummer) auf den Berichtsflughäfen zwischenlanden. Für Interkontflüge muss zusätzlich die gleiche Flugzeugregistrierung vorliegen“[302].

ADV (2014) defines transfer passengers as „Passagiere, die ihre Gesamtflugreise (Zusammensetzung von Teilstrecken) zwischen Herkunfts- und Endzielflughafen unterbrechen und unter anderer Flugnummer (bzw. bei gleicher Flugnummer mit einem anderen Flugzeug) weiterfliegen“.[303] The following table presents the monthly changes in passenger traffic (P) and air traffic movements (ATM) of German airports during the period 2010-2014. The values given are in each case in relation to the previous year.

Based on fundamental information by the ADV (2015) the figures in Table 18 can be interpreted as follows: Looking at the German airports they registered a passenger growth of 4.7% in the year 2010. Including transit traffic, this corresponds to a total passenger volume of approximately 190 million air passengers.

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[302] Translation from GER according to ADV (2014): "passengers who land within a route (flight under the same flight number) on the report airports. Additional intercontinental flights must have the same aircraft registration".

[303] Translation from GER according to ADV (2014): “passengers, who interrupt their total flight (composition of partial flights) between origin and final destination of the total flight and continue to fly with another flight number (or with the same flight number with another aircraft)".

TABLE 18: Changes in passenger traffic and air traffic movements; yrs. 2010-2014

Month	2010		2011		2012		2013		2014	
	P [%]	ATM [%]	P [%]	ATM [%]	P [%]	ATM [%]	P [%]	ATM [%]	P [%]	ATM [%]
Jan	+1.8	-3.5	+7.9	+7.0	+2.2	3.2	-4.3	-8.8	+3.4	+3.7
Feb	+0.2	-3.1	+7.3	+6.6	+2.0	-3.6	-2.9	-8.6	+3.2	+4.8
Mar	+8.9	+2.7	+0.0	+0.7	+3.3	-3.2	-1.1	-9.6	-0.6	+4.1
Apr	-16.7	-15.6	+30.0	+21.2	+1.6	-3.5	+0.4	-0.9	+1.7	-4.3
May	+7.4	+1.5	+5.5	+4.4	+0.0	-3.7	+1.5	-4.7	+2.5	+2.6
June	+7.2	+4.4	+3.0	-3.6	+3.0	+1.5	+2.3	-3.1	+2.8	-1.3
July	+7.1	+3.9	+3.2	-1.2	+2.0	-0.5	+0.4	-2.0	+1.4	-2.9
Aug	+7.7	+4.8	+1.1	+0.3	+2.9	-1.6	+2.2	-2.6	+6.1	-1.0
Sep	+10.1	+3.6	+2.6	+0.3	+0.7	-3.9	+2.1	-1.0	+4.7	+0.8
Oct	+9.1	+4.1	+0.1	-2.0	+1.2	-0.8	+2.2	-2.3	+2.7	+0.1
Nov	+7.8	+1.0	+1.8	+0.3	-2.0	-5.3	+0.9	-3.1	+4.7	+1.9
Dec	+0.6	-4.5	+7.2	+5.1	-4.3	-7.9	+2.2	-0.3	+3.5	+0.1

Source: ADV (2015); own illustration

Specifically in December 2010, a disproportionately decline in growth in passenger numbers and aircraft movements can be seen. April 2010 shows a striking disproportionate decline in passenger traffic (-16.7%) and aircraft movements (-15.6%), due to the volcanic eruption in Iceland and the related impact on the aviation sector. Adjusted for this effect, the decrease in 2010 is also influenced by an early winter and the associated decline in aircraft movements in

domestic air traffic by -6%, while the European air traffic increased above average by 5% and the intercontinental traffic by 7.5%, which is still a positive trend.

In 2011, a total of 198.2 million passengers were registered at German airports, which represents an increase in passenger traffic of 5%, essentially for the major German airports, especially for those with hub function and the associated European traffic, which increased by 8.3% during the year. Summarized, a significant decline in growth rates can be observed throughout the year, mainly in the domestic air transport (+1.6%) based on the introduction of air traffic tax and an associated rise in air fares. For the international air transport about 34 million passengers were registered, representing a decrease of 0.4%. Compared to the year 2010 and adjusted for extraordinary effects a market growth of about 3% was approved by the ADV (2011).

Table 19 presents the passenger development 2004-2014 per airport and evaluates the complexity of currently used BHS. The table also presents the capacity of the BHS in comparision with the number of air traffic passengers. As the figures show, airports such as Frankfurt a. M., Berlin-Tegel and Hamburg operate above their BHS capacity limit, which shows a need for investments in additional baggage handling capacity.

200 million passengers were registered at German airports in 2012. Compared with the year 2011, this corresponds to a growth rate of 1.1%, which is based on a decline in domestic air traffic of 3.6% and a growth of European traffic by 2%, and intercontinental traffic of 4.9%. The decline in passenger numbers and aircraft movements in November and December 2012 can be attributed to adjustments in the winter schedules of the airlines, so that all German airports were affected by declining passenger numbers. But overall weaker growth rates were achieved in 2012 in comparison with the previous year.

The year 2013 saw growth of 0.7% and a total of 201,813,523 registered air passengers, which is still behind the growth of 2012 (1.1%). In domestic air travel, a decline of 3.6% was observed which is mainly due to the thinning of the domestic air range of airlines. In contrast, a minimal growth of 0.4% was observed in intercontinental traffic. The total growth in 2013 is mainly attributed to the growth of 2.5% in European traffic.

TABLE 19: Passenger development yrs. 2004-2014
and BHS complexity

Airport	Passengers 2004	Baggage handling system		Passengers 2014	Passenger development 2004-2014
		Maximum capacity [million]	Complexity		
Frankfurt a. M.	50,767,968	56.0	yes	59,429,368	+17.06%
Munich	26,666,274	45.0	yes	39,593,025	+48.48%
Dusseldorf	15,150,471	22.0	yes	21,828,297	+44.08%
Berlin-Tegel	11,014,062	9.5	yes	20,675,371	+87.72%
Hamburg	9,817,543	11.0	yes	14,743,285	+50.17%
Cologn / Bonn	8,275,234	12.0	yes	9,429,642	+13.95%
Stuttgart	8,699,732	12.0	yes	9,697,762	+11.47%
Hannover	5,172,594	8.0	yes	5,270,979	+1.90%
Nuremberg	3,592,281	6.0	yes	3,239,159	-9.83%
Leipzig/Halle	1,949,559	4.5	no	2,298,329	+17.89%
Berlin-Schoenefeld	3,325,348	4.5	no	7,281,156	+118.96%
Bremen	1,650,119	2.0	no	2,767,877	+67.74%
Dresden	1,577,399	3.5	no	1,740,592	+10.34%
Munster/Osnabruck	1,457,471	4.3	no	886,186	-39.20%
Dortmund	1,179,028	n. i.	no	1,964,625	+66.63%
Erfurt	526,117	1.0	no	219,336	-58.31%
Saarbrucken	412,230	n. i.	no	353,011	-14.37%
Berlin-Tempelhof	441,558	1.5	no	0	-100.00%

Source: adapted from Richter (2013: 4); ADV (2015); modified; extended

In 2014 a total of 207,934,803 passengers were counted at German airports. Despite intensive strikes, a growth of 3.0% could be achieved as compared to 2013. In comparison to 2013, seven German airports faced decreases in traffic (13 airports 2013). Growth rates were mainly achieved in Europe (3.1%) and intercontinental traffic (5.6%) while the German domestic traffic showed growth of only 0.8%.

In summary, it can be estimated that the weak growth figures likely reflect a crisis-like situation in the development of German aviation in passenger traffic in the recent years. The development in passenger numbers considered over a period from 2004 to 2014 (Table 19) shows a generally positive trend of the development of passenger numbers. The disproportionate increase in passenger

numbers at airports Berlin-Schoenefeld and Berlin-Tegel is largely attributable to the closure of the airport Berlin-Tempelhof.

The decreasing number of aircraft movements, as presented in Table 18, partly reflects the trend of airlines to more efficient, ultimately bigger and comparatively more economical and cost saving aircraft. More efficient and larger aircraft can lead to shock loads in the baggage logistics, which should be considered as part of the overall concept of the BHS. Therefore new and challenging requirements related to the know-how of BHS-manufacturers and cooperation with airports will occur.

8.3 AIRPORT LOGISTICS PROCESSES

Due to the nearly homogeneous nature of the services offered by airlines, these can compete more on the quality and efficiency of their ground handling and so only differentiate on airport logistics processes (Kersten, 2013; von Heydebreck, 2009: 9). In this course the European Commission (2016) defines ground handling as follows:

"The term 'Groundhandling' covers a wide variety of services required by airlines in order to operate flights. These services include areas such as maintenance, fuel and freight handling. Groundhandling also covers services like passenger check-in, catering, baggage handling and transport within the airport itself." (European Commission, 2016, January 19)

The ICAO understands ground handling as follows:

> "The term "ground handling" has no formal, official definition, but is generally taken to broadly include services necessary for an aircraft's arrival at, and departure from, an airport. The ICAO Airport Economics Manual (Doc 9562) separates the ground handling function into terminal handling (passenger check-in, baggage and freight handling) and ramp handling (aircraft handling, cleaning and servicing)." (ICAO, 2014)

Thus, airport logistics are responsible for controlling the service processes of the airport (Scheimann, 2005: 18) and for harmonizing them (Richter, 2013: 9). Baumgarten and Butz (2003: 20-21) describe the responsibilities of airport logistics as the cross- divisional planning of material flows, personnel and information flows relating to the areas baggage, passengers, cargo and aircraft and thus

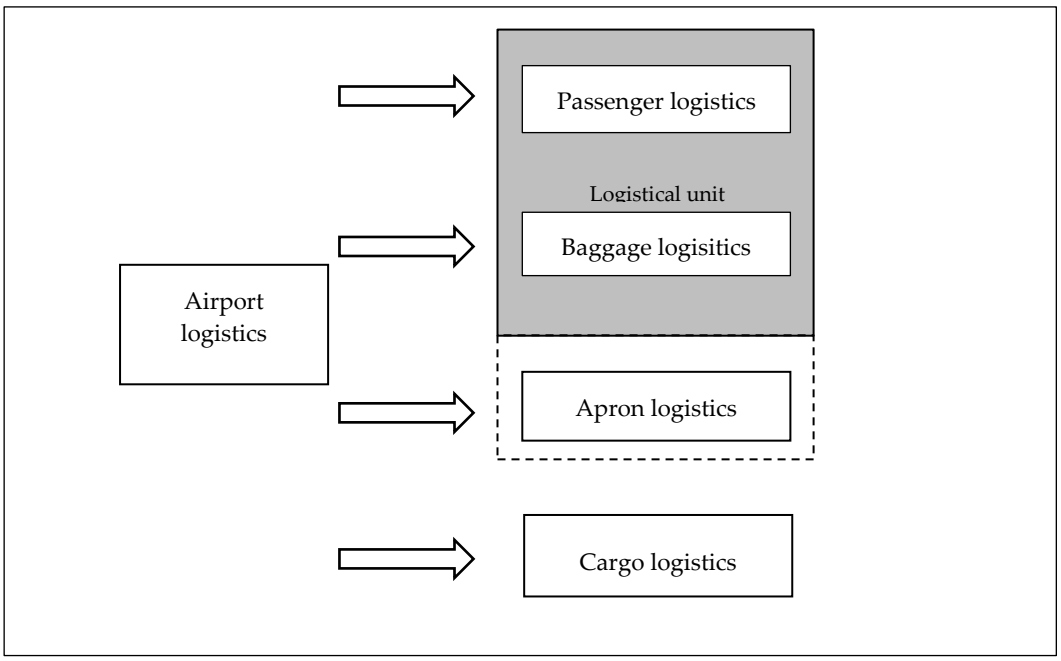
consisting of the fields of baggage, apron, passenger and cargo logistics (Scheimann, 2005: 17-18).

Emmermann and Smekal (1999: 151) argue that passenger logistics cover all passenger-related processes from the time of arrival of the passenger at the airport until the time at which the passenger leaves the airport again. In this course Emmermann and Smekal (1999: 150) argue that apron logistics include all tasks that relate to the area between aircraft and the terminal, including the loading and unloading of aircraft, while freight logistics concern all transport and storage processes of cargo inside the airport (Kersten, 2013). Scheimann (2005: 18) points out that the objective of baggage logistics includes fast, secure and error-free loading and unloading of aircraft with passenger luggage, in which the luggage sorting technology plays a crucial role.

The logistic processes at airports are in constant interaction with each other and determine in their interaction the efficiency of an airport. Scheimann (2013: 17-18) argues, as Figure 12 presents, that passenger and baggage logistics are a logistical unit that is essential for the efficiency of an airport. Richter (2013: 20) argues accordingly that the passenger flows can be distinguished in arriving passengers, transfer passengers and departing passengers and states that the passenger flows are largely unaffected by the size of the airport.

Therefore, it is a special challenge for hub airports to handle transfer passengers concerning the baggage logistic process, because of the time given for the transfer processes and the transport of the baggage. Richter (2013: 20) argues that at a coupling of the passenger and baggage logistics processes it is the baggage logistics process that takes the lead for the further logistical process sequences. Brendlin (2002) and Richter (2013: 9) define efficient baggage and passenger logistics as the central tasks of airport logistics.

FIGURE 12: Components of airport logisitics



Source: adapted from Scheimann (2005: 19)

In order to focus on the subject of this dissertation with regard to airport logistics processes, in the further course baggage logistics processes will be subject to special consideration.

8.4 BAGGAGE HANDLING LOGISTICS - KEY FACTOR FOR AIRPORT COMPETITIVENESS

With steadily increasing passenger numbers at German airports,[304] the requirements on BHS also increase. The systems must not only be able to process the growing number of pieces of baggage, but they also have to be able to meet the permanently increasing security requirements. Modern and efficient systems are nowadays able to transport, save and sort several thousand pieces of luggage per hour, so that they are available at a defined time at a defined location for

[304] Cf. Subchapter 8.2 (Tab. 18; Tab. 19).

further processing.[305] Therefore, the nature of the airport as well as the individual design of the baggage handling technology plays a crucial role. Special factors are here the architecture of the terminal and the type and number of interfaces to other parties involved in the logistic process. For example, if an airport meets a hub function[306] with a high or moderate proportion of transfer passengers, sufficient storage capacity is needed to store the luggage in the logistic baggage handling process for the duration of the transfer.

Bondzio (1996) generally states that the speed and reliability of the baggage logistic processes are an important criterion for the competitiveness of an airport. The speed of the baggage logistics process has an impact on the capacity of passenger and baggage transport and therefore on the key tasks of an airport. This is of special importance for hub airports, as they are dependent on fast and reliable baggage logistics due to high proportion of transfer passengers, so that the passengers can rely on the possibility of flexible transfer opportunities and short transfer times. Especially with short transfer times, reliability also plays a crucial role in addition to the speed of the baggage logistics process. Therefore, the BHS is the central and most important system in the baggage handling process and represents a possible logistic bottleneck. In practice, failure of the BHS almost always results in flight delays or costly deliveries of the baggage to the airline passenger. Investigations of the SITA (2006), which are based on information provided by the IATA, revealed that about 1% of all baggage is

[305] For example, Hamburg Airport, which according to the ICAO-classification is a secondary hub, is designed for a capacity of 14 million passengers per year and 26,000 passengers per day. The passenger numbers presented in Table 19 (Subchapter 8.2) shows that the airport already achieved its capacity limit. The centerpiece of the BHS is the baggage sorting system, which sorts the baggage of 108 check-in counters (Terminal 1: 58 counters; Terminal 2: 50 counters). The capacity of the sorting system is designed to 9,300 pieces of baggage per hour (Airport, 2014).

[306] Cf. Subchapter 8.1 (Tab. 17).

misdirected (mishandled[307]). The study identifies average costs of USD 87.50 per misdirected piece of baggage and a total volume of 1.95 billion passengers with 1.5 pieces of baggage. With an increasing number of air travelers, the risk of cost increase of mishandled baggage increases as well. SITA (2015: 4) states accordingly that "(…) baggage processes, systems and infrastructure inevitably come under pressure as passenger traffic increases and there is a correlation between 2014's growth in passenger numbers and the level of bag mishandling. Regionally, the greater the growth in passengers, the greater the impact on bag mishandling". According to SITA (2015: 2) in 2014 worldwide 3.3 billion flight passengers were counted. This is an increase of 5.43% compared to the previous year 2013 (SITA, 2014: 2). The total number of mishandled bags increased by 10.5% from 21.8 million in 2013 to 24.1 million in 2014, which means 7.3 mishandled bags per 1.000 passengers in 2014 occurred by the increase of aircraft load factors up to 79.7% and a related pressure on infrastructure and processes (SITA, 2015: 6). Since 2007 the number of mishandled bags fell by 48.5% in an eight-year period, from 46.9 million (18.9 bags per thousand passengers) to 24.1 million in 2014 (SITA, 2015: 6). As a result "The overall cost of mishandled bags to the industry was USD 2.4 billion in 2014 (USD 2.09 billion in 2013). (…), this is a sizable reduction on USD 4.22 billion mishandling cost racked up in 2007" (SITA, 2015: 6).[308]

If the figures presented above were applied to German airports, Table 20 presents an overall picture for 2014. Accordingly, 1,636,623 pieces of baggage had been misdirected. With average cost per mishandled bag[309] of USD 99.58 the total cost for these airports are approximately USD 162.48 million.[310]

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[307] "A mishandled bag is a report of a delayed, damaged or pilfered bag which is recorded by either an airline or its handling company on behalf of the passenger and that is handled as a claim" (SITA, 2015: 21).

[308] McCartney (2014:1) refers to the year 2013 and states that "Repatriating delayed or lost luggage to passengers cost an average of $100 per bag, and there had been a steady increase in the frequency of mishandled baggage until then".

[309] Calculation as following: overall cost 2014 (24 billion) divided by 24.1 million mishandled bags (cost per mishandled bag: USD 99.58). Compared to the

TABLE 20a: Average costs for mishandled baggage at German airports, year 2014, part 1

Airport	IATA-Code	Passengers 2014	Mishandled baggage 2014 (estimation)	Average total costs 2014 [USD]
Berlin-Schonefeld	SXF	7,281,156	53,152	5,292,876
Berlin-Tegel	TXL	20,675,371	150,930	15,029,609
Bremen	BRE	2,767,877	20,205	2,012,014
Dortmund	DTM	1,964,625	14,342	1,428,176
Dresden	DRS	1,740,592	12,706	1,265,263
Dusseldorf	DUS	21,828,297	159,347	15,867,774
Erfurt	ERF	219,336	1,601	159,428
Frankfurt a. M.	FRA	59,429,368	433,834	43,201,190
Friedrichshafen	FDH	594,117	4,337	431,878
Hahn	HHN	2,380,932	17,381	1,730,800
Hamburg	HAM	14,743,285	107,626	10,717,397

Source: adapted from ADV (2015); SITA (2015); own illustration

study SITA (2006), this corresponds to an increase of the cost per mishandled bag of USD 8.12 (13.8%).

[310] In addition it must be shown that the indicated values do not take into account the complexity of the baggage handling technology and makes no distinction based on the classification of the German airports. The aim of the presentation is rather the identification of the economic damage.

TABLE 20b: Average costs for mishandled baggage at German airports, year 2014, part 2

Airport	IATA-Code	Passengers 2014	Mishandled baggage 2014 (estimation)	Average total costs 2014 [USD]
Hannover	HAJ	5,270,979	38,478	3,831,639
Karlsruhe/Baden-Baden	FKB	979,511	7,150	711,997
Köln / Bonn	CGN	9,429,642	68,836	6,854,689
Leipzig/Halle	LEJ	2,298,329	16,778	1,670,753
München	MUC	39,593,025	289,029	28,781,508
Munster/Osnabruck	FMO	886,186	6,469	644,183
Nürnberg	NUE	3,239,159	23,646	2,354,669
Paderborn/Lippstadt	PAD	760,044	5,548	552,470
Saarbrucken	SCN	353,011	2,527	251,639
Stuttgart	STR	9,697,762	70,794	7,049,667
Weeze	NRN	1,806,946	131,907	13,135,299

Source: adapted from ADV (2015); SITA (2015); own illustration

Table 21 presents the result of the studies made by SITA of the years 2010 (SITA, 2011b) and 2015 (SITA, 2015) about the reasons for the misdirection or misleading of passenger baggage at airports.

Both studies confirm the above statements that the focus of challenges at airports is on the handling of transfer baggage, which with an error rate of 49% (2014) or 51% (2010) is the predominant cause for baggage handling faults. The misdirection by loading error accounts for 15% (2014) of the frequency of errors followed by e.g. faulty labeling or safety defects.

TABLE 21: Baggage handling faults

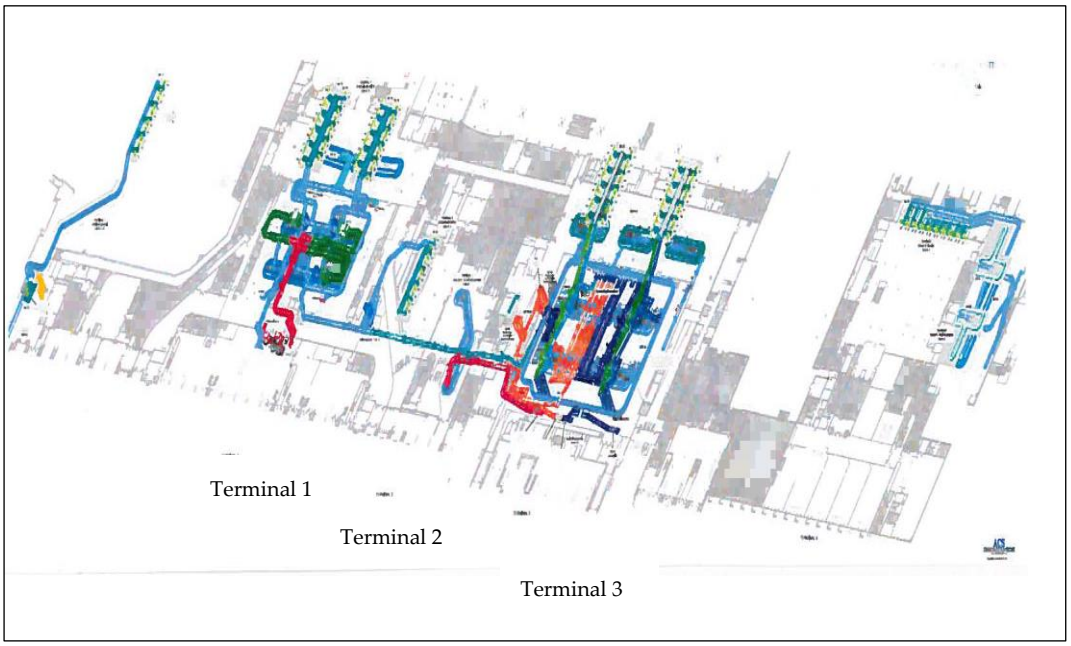
Reason	2010	2014
Transfer baggage mishandling	51%	49%
Failed to Load	14%	15%
Ticketing Error/Bag Switch/Security/Other	12%	15%
Airport/Customs/Weather/Space-Weight Restrictions	10%	7%
Loading/Offloading Error	6%	6%
Tagging Error	4%	4%
Arrival Station Mishandling	3%	3%

Source: adapted from SITA (2011b); SITA (2015)

Only 3% of misdirected luggage can be related to the handling at the final destination. This shows that airports that are exposed to a high proportion of transfer passengers and a corresponding stress of the BHS have a significantly higher risk of mishandling or misdirecting passenger baggage than e.g. airports with the focus on regional traffic, who handle a rather small, or no share, of transfer operations.

The figure below shows on hand of the example of the Airport Stuttgart the complexity of the BHS and its linking via several terminals (Terminal 1-3) and makes it clear that an interaction of different parts of the BHS and subsystems into a complete system makes it able to ensure the functioning of the total system.

FIGURE 13: BHS complexity at airport Stuttgart



Source: adapted from Kaschdailewitsch (2015); modified

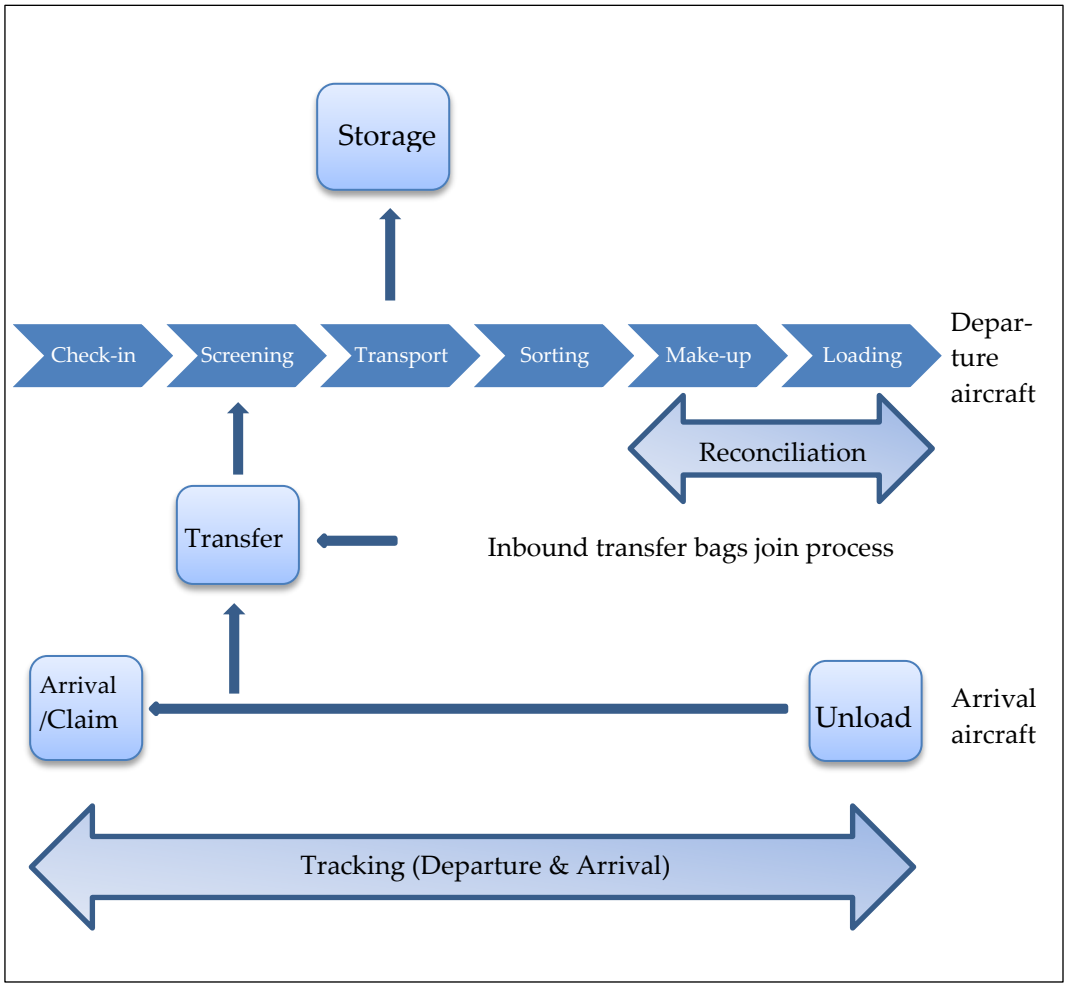
The statements above show the high value of the selection and use of appropriate BHS at airports, and what crucial influence this has on the competitiveness of the airports as customers for BHS-manufacturers. The higher the proportion of transfer passengers of an airport, the higher are the demands on the BHS and related processes and systems. To handle these complex challenges, an interplay is necessary between the baggage logistics process, shaping and developing actors at the airport, and the baggage handling technology and systems, developing and manufacturing actors.

8.5 BAGGAGE HANDLING PROCESS

Baggage handling processes are a part of the core achievements of the airport logistics services and have a direct effect on the economic success and competitiveness of the airport. In contrast to the considerations of the previous chapters, the following discussion of Subchapter 8.5 deals with the processes close

to the conveyor system. Therefore, the following figure schematically shows the most important process steps in the baggage handling processes.

FIGURE 14: Baggage handling process



Source: adapted from SITA (2011a); modified

Figure 14 presents the process chain of the baggage handling and refers to the process steps located directly at the airport. Recent literature also presents other descriptions of the baggage process chain, which include the delivery and

the collection of the baggage to and from the airport.[311] These process steps are organized individually and independently by the airline passenger and largely elude the control possibilities of the airport. Therefore, these processes cannot be a part of internal airport baggage logistics, in particular of a BHS, and are excluded from consideration in the course of this dissertation. Starting from the individual stations or process steps of the baggage handling process, the focus here is on the core achievements of an airport, which is the system-related baggage handling. Furthermore, insight into the complexity of BHS in baggage logistics processes is also provided. With reference to Figure 15, the general process of transportation of baggage by a BHS can be described as follows:[312]

With reference to the numbering (in brackets) in Figure 15 the conveying process begins with the registration of the baggage at the check-in (1) and the placement of the baggage on a entry belt (2) that is usually associated with a

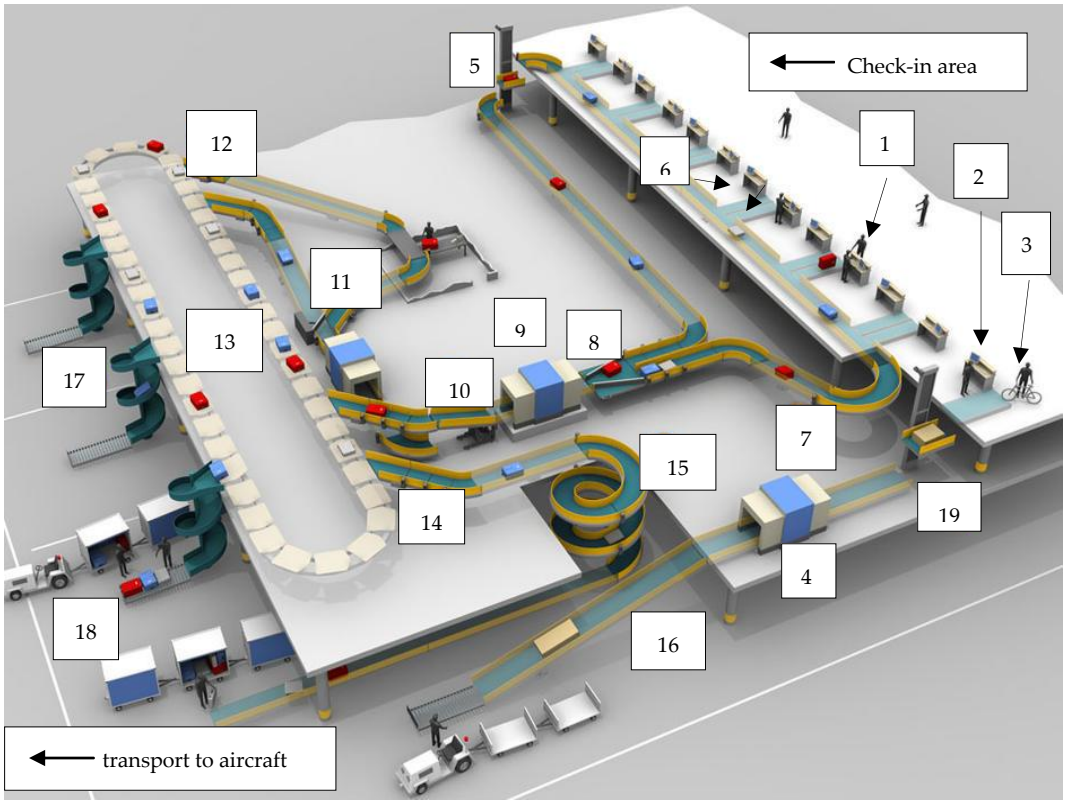
[311] Cf. von Dietmann (2008: 75-77). Starting from the connection of an airport as a part of its integration into the traffic network system, the incoming or outgoing carriage of passenger baggage is included in the process chain. Following this argumentation, the baggage process chain starts with the individual baggage transfer and therefore at the starting point of the journey of a passenger. Accordingly, the process chain ending at the destination of the journey of the passenger as well as the removal of baggage is included in this perspesctive. At the same time this argumentation includes other means of traffic and transport concepts. However, the airport-specific definition of the material handling process remains open. For the set focus in this dissertation and consideration of the legal and regulatory requirements this kind of the argumentation of the process chain is not effective, as it represents the BHS, as a core segment of baggage logistics processes at the airport, only as a part of the process with all other process steps outside the sphere of influence of the manufacturer of a BHS.

[312] Significant sub-processes are considered separately in the following chapters. Due to the fact that there are a variety of different transport systems (e.g. belt systems, container systems, pulley systems, destination coded vehicle systems) the following argumentation refers to the example of a belt system.

weighing device. From the entry belt the baggage will be passed onto a feed belt (6), which takes care of the transport within the system. In order to overcome construction related height differences luggage lifts (5), spiral belt conveyors (17) or spiral chutes (17) can be used in a BHS.

The feed belt conveyor transports the baggage to a timed entry belt (8) which is situated in front of the security check (9; usually X-ray scanners) and feeds the baggage according to the scanner speed into the security check device. Waiting times may occur due to the timing of the baggage, which can cause system bottlenecks in phases of high baggage volume.

FIGURE 15: Baggage handling system



Source: adapted from Transnorm (2014); modified

After passing the security check the luggage of another timed belt (10) will be supplied to the sorter (13) and fed-in. The sorter takes over both the sorting of outgoing and incoming baggage. The sorter seperates the proportion of transfer baggage contained in the incoming baggage from the baggage that is transported to the baggage claim area. Baggage that can not be clearly identified (for example due to a damaged barcode) by the system can be fed back to the sorting system (12) after passing a security check via a special manual workstation (11). The sorter hands the outgoing baggage identified for a particular flight to another transport item, in the example a spiral chute (17), which provides luggage for further loading on trolleys (18). Bulky items (3) pass through a separate conveying process, which in the example uses a bulky luggage lift (19), a safety device (4) and a height difference bridging inclining conveyor (16) and is then available to be placed on a trolley.

The trolleys take over the transport of the baggage over the apron in order to load the baggage on board of the aircraft and do not belong to the BHS in the context of this argumentation.

8.5.1 Check-in

The check-in area is located inside the airport and directly in front of the check-in counter and has the goal to guide the passenger flow targeted to the check-in counters (Figure 15, no. 1). At many airports this area begins with barriers that serve to guide the direction of the passenger flows. The areas where passengers can use self-check-in-counters or other automated systems are also a part of the check-in area at many airports.[313] As shown in Figure 15 the check-in is the interface between passenger and BHS, that receives the baggage feed through a corresponding feed-in belt (Figure 15, no. 2). In the check-in phase, the passenger passes an identity check, the boarding pass will be created, which is

[313] Bien and Franke (2004: 45-46) refer to the testing and possible introduction of automated service points at which passengers, if necessary supported by airport staff or independently, can feed their baggage to the baggage logistics process.

also required in order to pass additional security checks, and the baggage of the passenger will be captured.

In addition to determining the weight of the baggage the baggage also gets a label, on which the respective departure and final destination and the flight numbers are listed. The marking is usually carried out by means of plain text and machine-readable bar code. For security reasons, the information system ensures that the baggage is clearly assigned and linked to the passenger.[314] This assignment remains throughout the entire transport process, from the initial location via possible transfer destinations to the final destination, although of the separation of the process chains of passenger logistics and baggage logistics after check-in.[315]

A special issue is the bulk baggage, which can only be handled at specially equipped check-in areas (Figure 15, no. 3). Due to the dimensions and / or the weight of the bulk baggage this can not be transported on the general handling systems intended for normal passenger baggage. The appropriate systems must be designed for heavy weights and / or large dimensions. Baggage logistic processes for bulk baggage can therefore rarely be automated, so that the proportion of costly manual labor is high and the efficiency of the systems used is low. Therefore airports usually try to keep the proportion of bulk luggage down or use special engineered baggage handling technology that allows handling a high proportion of bulk baggage.

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[314] For several years encodable chips (RFID) have been used as information carriers in logistics systems. In addition to containing information, they allow for process tracking of the transported or conveyed goods within the logistics process. A sole use of RFID chips for the identification of baggage turns out to be difficult, because there are systems that can decode the information for the logistic control, but they do not cover all airports. The passengers would not necessarily recognize their own luggage, particularly on transfer flights. Therefore, it is not yet possible to renounce plain text on a label.

[315] Cf. Subchapter 8.3 concerning the logistics unit of the passenger handling and baggage handling process.

8.5.2 Baggage transport

Modern automated BHS generally transport, sort and merge the baggage. Particularly at airports with a high proportion of transfer passengers and / or the possibility to check-in the evening before or to check-in early, such systems can, if necessary, take over the storage of passenger baggage.

Modern BHS consist of a number of (possibly customized) components and subsystems that, due to their specialization, are able to fulfill certain tasks and can be combined in their entirety to a system. Figure 15[316] provides such a BHS as an example, in which individual components or subsystems crucial for the process have been numbered.

In a BHS those subsystems that are responsible for the transport, sorting and security systems, which will be discussed in the following Subchapters, have a crucial and major part. Scheimann (2005: 48) argues that to fulfill the requirements for system security, modern systems usually have redundant subsystems, which can take over that function in case of failure of a sub-system. This is only possible within certain limits, as in the case of a sorting system fault (Figure 15, no. 13) there is usually no redundant system that can take over its function. For example, at Hamburg Airport a common sorter is used for sorting the bags at both terminals. If this sorter is out of order due to a malfunction, there is no redundant system, so that the sorting must be carried manually. This has a dramatic impact on the efficiency and performance of the airport in its core process baggage handling logistics.

8.5.2.1 Baggage transport systems

The different nature and compositon of baggage means that a BHS must be able to transport baggage of different materials, shapes and weight. Based on an individual baggage profile created from the airport, and in connection with the transported amount of baggage, manufacturers of BHS are able to design the system so that it can process the baggage within a defined range and bandwidth. Outside of this range the baggage cannot be transported with the BHS for normal flight baggage, and must, for example, use separate conveyor systems, like

[316] Cf. Subchapter 8.5.

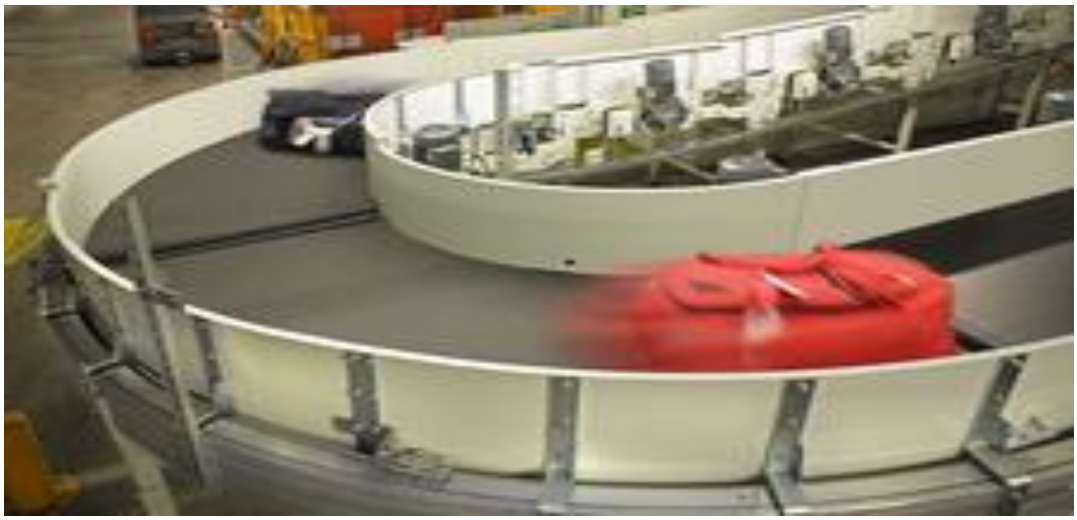
conveying systems that are usually used for bulk baggage (Figure 15, no. 3).[317] Scheimann (2005: 94-95) argues that different basic technologies are used for the baggage transport in order to meet these requirements. Hence, beside belt conveyor systems, container systems, DCVs and roller systems[318] are also in use at airports.

Due to their advanced technology and simple structure, belt conveyor systems are the most widely used systems at airports. The baggage is transported by friction and this directly on a conveyor belt. Compared with other systems (e.g. container systems, DCVs, etc.) belt conveyor systems are more cost-effective to procure, with lower investment needs, and their expandability is more flexible than other systems. The friction-based work principle is the reason for the advantages and disadvantages of the systems. In addition to the relatively low cost, another advantage is that the luggage is placed directly on the belt and no separate support unit is required. Revised transportation, storage and the time-critical provision of support units, which could lead to a bottleneck in the system, is not necessary. Richter (2013: 74-75) states about belt conveyor systems that crucial advantages are the robustness, low wear, low investment and maintenance costs, modular expandability, low energy consumption through the low drive power required, and their possible use for bulk baggage transportation tasks.

[317] Cf. Subchapter 8.5.

[318] Roller systems can be applied for transporting bulk baggage equipment, which usually requires a suitable carrier system that is able to store the baggage.

FIGURE 16: Belt curve conveyor system



Source: adapted from Transnorm (2014)

The disadvantage is that due to the friction belt systems are suitable only for the realization of limited slopes and curves and in such cases need sophisticated technology and special belt geometry. In order to exploit the limits of climbing ability, different surface structures were developed by the manufacturers of belts and BHS-manufacturers. However, in individual cases a rolling of unfavorably shaped baggage cannot be excluded (e.g. a backpack). Belt systems are typically composed of a combination of several belt conveyors. The length of the individual belts is limited due to the friction of the belt in combination with the baggage weight on the conveyor body. This creates a gap, which may in practice lead to problems at the interfaces of the belt conveyors. So belts, buckles, locks or labels contained on the baggage may get caught in the gap and cause damage to the baggage, or cause the baggage to be unidentifiable by the system and possibly misguided.

Contrary to friction-based belt systems, container conveyor systems protect the baggage from damage. The systems can be divided into active and passive systems. Active systems (e.g. DCVs) are addressed separately below. Passive systems do not have their own drive, run freely and are driven by pulse generators positioned at intervals. At the same time container-belt systems are

applied in practice. The basic principle is usually on the friction between the belt and the container, which stores only one piece of baggage at the same time. There are also container conveyor systems available that are based on a form-fitting connection between the container and the conveyor system (e.g. Airport Frankfurt a. M.).

FIGURE 17: Form-fitting container conveyor system (a; b)

a b

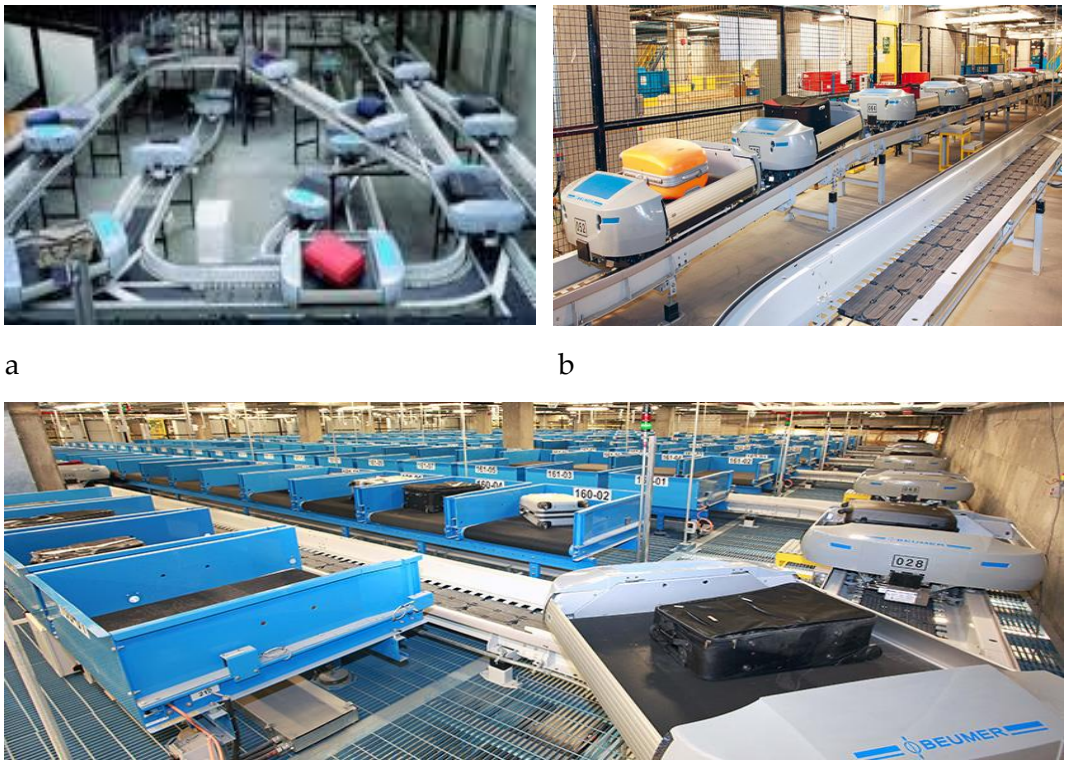
Source: adapted from Fraport (2014)

The defined container size and thus the defined position of the baggage means that higher transport speeds can be achieved than with pure belt conveyor systems. Richter (2013: 79) argues that major advantages of the container conveyor systems lie in the safe transport of the baggage in uniform designed transport units, the expansion flexibility, the small number of interfaces, and the ability to remote baggage sorting and easier sorting options via switches that require no complex sorting technology. A serious disadvantage of the system is, in addition to the higher noise level, a difficult logistical return of the container, the storage and the timely provision of empty containers at the loading point. This disadvantage can lead to capacity-limiting bottlenecks of the system in daily practice. Additional disadvantages arise from the size of the container that limits the size of the carried baggage and the high investment and maintenance costs.

A Destination Coded Vehicle system (DCV) is an active container conveyor system, mainly used in the industry in order to ensure the internal material flow. A DCV substantially consists of a container that is equipped with a linear drive, a

control unit and a loading or unloading system, thus forming an active unit. Richter (2013: 80) states that this unit is no longer conveyor belt driven and can therefore been controlled independently.

FIGURE 18: DCV baggage handling system (a; b) and late baggage store (c)



a b

c

Source: adapted from Beumer (2014); modified

These systems are able to avoid bottlenecks in the overall system through flexible routing. Richter (2013: 81) describes the uniformity of the transport units, their autonomous flexibility regarding the prevention of bottlenecks, easier sorting options, the high transport speed (up to 10m/s) and their suitability for a centralized or decentralized baggage sorting as advantages of the system. Fay and Fischer (2004: 335-336) point out that significant disadvantages of the system are the high investment costs, high maintenance costs and high demands on the

control technology of the system. Richter (2013: 81) mentions further disadvantages, which arise from the container, which limits the baggage size, the need for a complex rail system, interfaces to peripheral systems (safety technology, storage) and a system load through the carriage of empty transport containers.

Roller conveyor systems are used in addition to belt conveyor systems especially for the transport of cargo and bulk luggage. Roller conveyor systems can withstand high loads, which are located on a carrier. The carrier ensures a force-distribution of the load on a plurality of rollers and fixes them during transport. Roller conveyor systems can be equipped with both non-powered and / or with e.g. driven drum motors rollers. The advantages of roller conveyor systems lie, in addition to the low investment costs, in their robustness and flexibility as well as their low maintenance costs.

FIGURE 19: Roller based system platform

Source: adapted from Interroll (2014)

Gravity conveyor systems are material handling systems and used for bridging height differences in the baggage handling process. In practice the main focus is on roller conveyors or slides (Figure 15, no. 17)[319] in use. The functional principle of the baggage slides is based on overcoming the frictional connection

[319] Cf. Subchapter 8.5.

between the baggage and the surface of the conveyor by means of gravity in combination with the angle of inclination.

FIGURE 20: Baggage chute

a

b

c

Source: adapted from (a) Transnorm System (2014);
(b) Interroll Portec (2014); (c): Alstef (2014)

As an alternative to straight slides, spiral chutes offer the possibility to take better advantage of the available space at the airport. Richter (2013: 76) states that the low investment costs, low maintenance requirements and low operating costs can be cited as advantages of gravity conveyors.

With regard to the selection of a baggage handling concept and the associated investment in logistic BHS, it is also crucial to consider the total cost and the efficiency of the system over its planned life cycle.

8.5.2.2 Sorter systems

Within the baggage handling process, the sorting of baggage is a core task of the BHS. There are various technologies that are able to sort the baggage according to different criteria (e.g. destination, flight number, flight date, passenger classification, etc.). In practice, different systems are used, which are briefly described below:

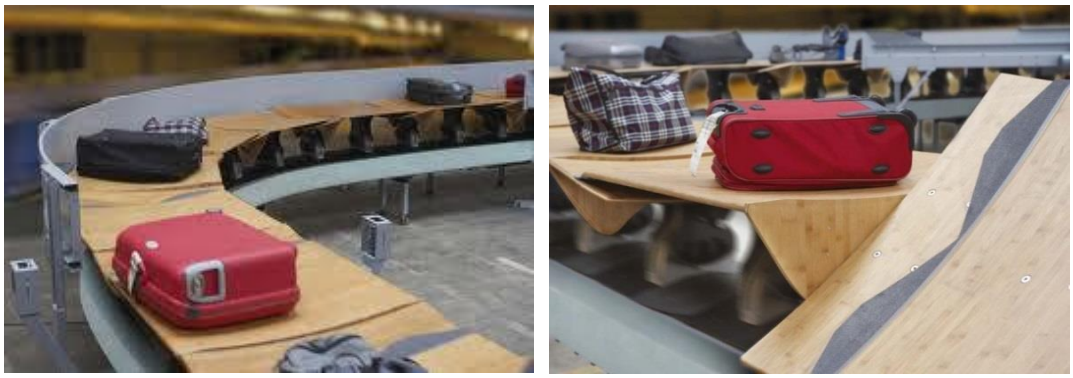
The circular sorter stands synonymous for a variety of possible sorting systems, such as tilt-tray sorters or cross-belt sorters, etc. All systems share the spatial arrangement in the basic shape of a closed group, an ellipse or allied trajectories. Here, in general, are the base systems, which contain the baggage carrying unit, connected to each other by chains or flexible retaining elements. The spin-sorter (Fig. 24), represents a special form which will be presented at later on.

Tilt-tray sorters are a central sorting system, to which the baggage is usually supplied by means of belt systems and tiltable tray elements (e.g. shells, tubs, etc.), which are movable and interconnected. The sorter is able to approach a large number of sorting destinations on which the pieces of baggage are dropped in the appropriate baggage chutes by a tilting movement of the storage elements. The advantages of the system are the high number of addressable sorting destinations, the high speed sorting, and a high flexibility in adjustments in the number of sorting destinations. Disadvantages of the system are the interfaces for loading and unloading, the limitation of baggage size through the storage elements, and the susceptibility to falure (e.g. by straps, belts, etc.), which can lead to a total breakdown of the system and to a capacity bottleneck of the overall system.

FIGURE 21: Circular sorter system with baggage chute at Hamburg Airport

Source: adapted from Beumer (2014)

FIGURE 22: Tilt-tray sorter system (a; b)



a b

Source: adapted from Vanderlande (2014)

Cross-belt sorter systems consist of a series of ride-on conveyor belts, which are arranged at an angle of 90 degrees to the conveying direction (cross-belt). Each piece of baggage to be sorted is associated with a conveyor belt. The baggage holds on the cross-belt by the means of friction. If the respective target position has been reached, a separate drive unit activates the cross-belt which discharges the luggage on a collecting chute (gravity conveyors) from the sorting process. The advantages of a cross-belt sorter lies mainly in its high sorting capacity, the high number of viable sorting destinations and the ease of integration of new sorting destinations.

FIGURE 23: Cross-belt sorter system

Source: adapted from Interroll (2014)

System-related disadvantages are substantially (similar to the tilt-tray sorters) that the system for loading and unloading must be connected and synchronized via interfaces with peripheral systems. Other disadvantages are the limitation of the baggage size and the baggage weights, as well as the undefined storage of baggage on the cross-belt. This may cause the system to malfunction by possible

damages of the baggage (e.g. backpack straps caught between the cross-belts). Therefore, system failures may lead to a complete failure of the entire BHS.

The spin-sorter is a special form of a circular sorter, in which the individual sorter elements are rigidly connected to one another around a central axis rotating carrier system. In this system, all support units are equidistant from the central axis. The system was designed for applications with small available space, high flexibility of baggage sorting capacity up to 6,000 pieces of baggage per hour, and an easy integration into existing system structures. With its simple and scalable cascaded sorting principle and the cost-effective design, the system supports the pursuit of customers for low life cycle costs.

FIGURE 24: Spin-sorter

Source: adapted from Lödige (2014)

The push-tray sorter is generally used in combination with belt installations. Retrofits or extensions to existing belt systems to a sorting function are also possible with this system. The system is characterized by sorting baggage that is

transported on a belt conveyor system by means of a pusher which operates at an angle of 90 degrees to the conveying direction. Besides the advantage of modular retrofit of existing belt conveyor systems, it is a disadvantage of the system that the thrust of the pusher must be tailored to the luggage weights and overcome the frictional forces.

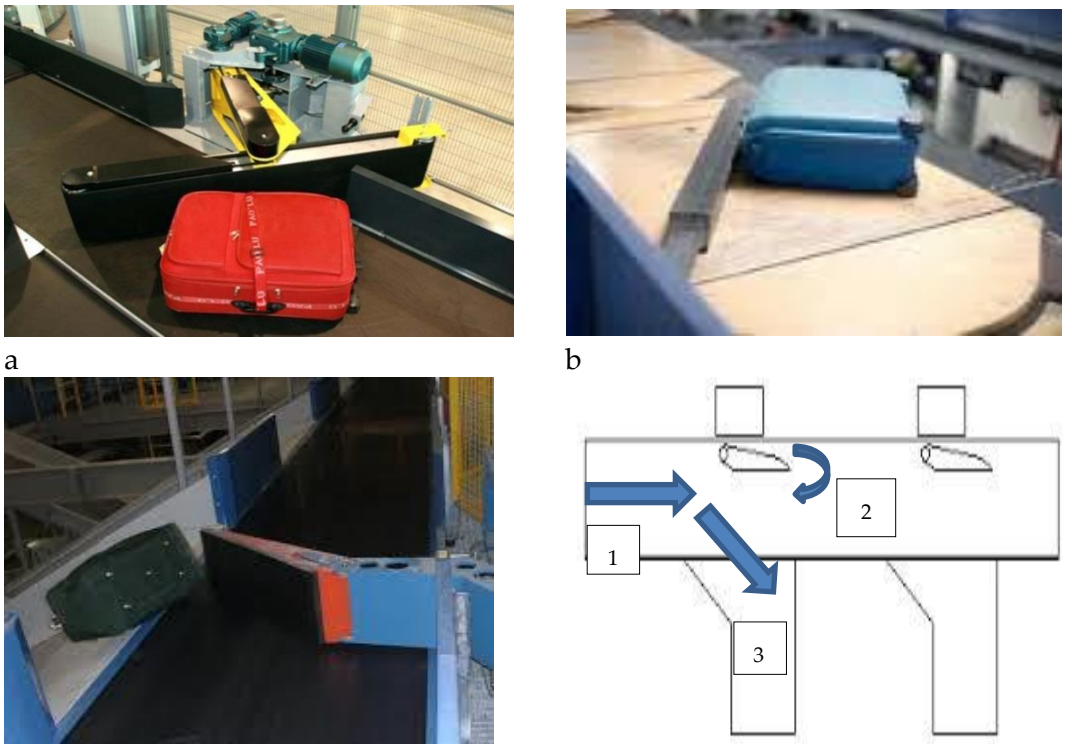
FIGURE 25: Parallel push-tray sorter

Source: adapted from Vanderlande (2014)

The swing-panel sorter functions similar to the push-tray sorter and is usually used in conjunction with belt conveyor systems. Figure 26d presents the general functional principle of the swing-panel sorter. The baggage is conveyed in accordance with the conveying direction (1). When approaching the target position a swing arm (2), which can be rotated about an axis over the entire width of the conveyor belt, moves over the belt conveyor in accordance with the speed of the belt. The swing arm guides the piece of baggage on an exit belt conveyor (3)

and then returns to its starting position. Advantages of this system are in the retrofitting of existing belt systems that can be expanded to include the sort function. Richter (2013: 87) states that despite of increased space requirements the swing arm provides the opportunity to add an additional conveyor belt, so that both provide the advantage that even large pieces of baggage can be sorted out.

FIGURE 26: Swing-panel sorter (a; b; c) and functional principle (d)



a b

c d

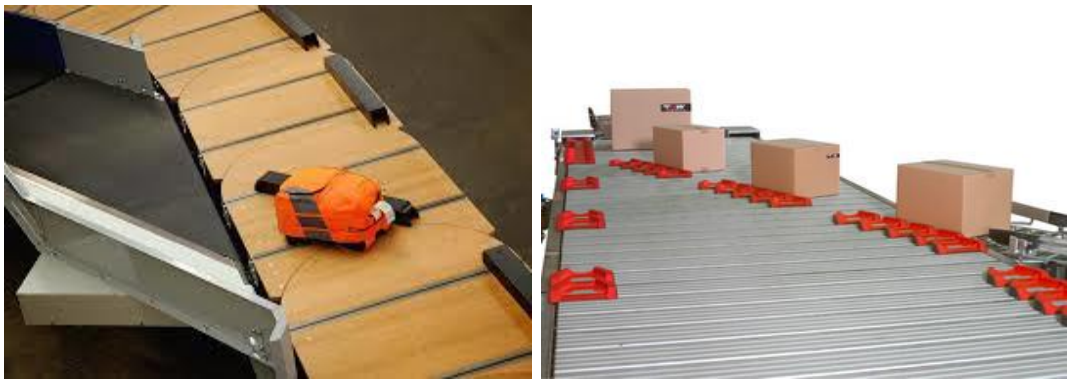
Source: adapted from: (a; b): Vanderlande (2014);

(c): Logplan, 2014; (d): own illustration

Slide-shoe sorters are also based on the basic principle of a belt system, where the belt is generally made of aluminum plates and is equipped with a movable slide element (slide-shoe). When required the slide-shoe can be moved at an angle of 90 degrees to the direction over the entire bandwidth. Upon reaching

the target position of the baggage, the slide-shoe pushes the baggage laterally to a receiving device (e.g. a gravity conveyor, etc.).

FIGURE 27: Slide-shoe sorter



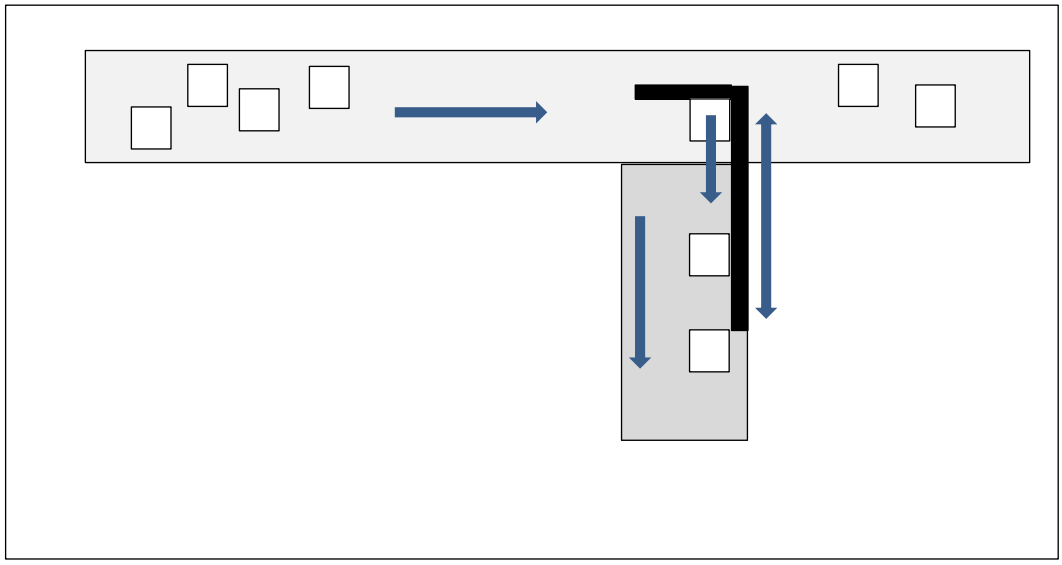
a b

Source: adapted from (a): Vanderlande Industries (2014);

(b): TGW (2014); modified

The operating principle of a pull sorter system is based on a pulling movement, which exerts a lateral mechanical pulse on the piece of baggage. The lateral pulse of tension transports the baggage onto a different belt conveyor that has a different direction compared to the initial conveying direction. After that the traction device moves back into its initial position. Figure 28 presents this process graphically. In addition to the ability to integrate into existing conveyor systems, more significant advantages of the system lie in the simultaneous alignment and positioning of the pieces of baggage so that they can assume a defined position on the belt system for the additional baggage handling process. The disadvantage however is the complex mechanics and the function of the operating speed of the pulling mechanism, especially in undefined positions of the baggage that is to be sorted (Figure 28).

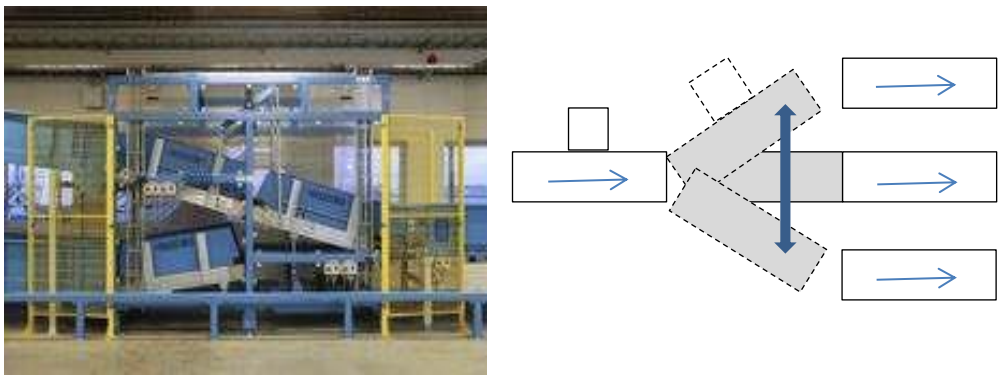
FIGURE 28: Pull sorter



Source: own illustration

A Vertical sorter system is characterized particularly by the fact that it can establish the connection between several possibly existinging belt systems. The sorting function is realized by a vertically moving belt that moves the piece of luggage forward, above or underneath the level of the initial belt system (Figure 29b).

FIGURE 29: Vertical sorter



a b

Source: adapted from (a) Transnorm (2014);
(b) own illustration

An advantage of the system lies in the subsequent integration into existing conveyor systems and comparatively low maintenance costs. However, a disadvantage is the increased noise level that arises by the abutment of mechanical parts. Another disadvantage is the effect of a system failure, because a failure of the vertical sorter affects the other multiple levels of the belt conveyor system and leads to a capacity bottleneck.

8.5.2.3 Information process

A continuous flow of information is critical to the interruption-free flow of the baggage handling process at the airport. Each piece of baggage is therefore clearly assigned within the baggage handling system to one place of departure, transfer and final destination, whereby less time-critical baggage must not forcibly stay within the BHS. Bien and Franke (2004: 49) therefore point out that an agreement with peripheral systems is necessary in order to ensure a continuous flow of information so that a clear assignment of the baggage can be guaranteed.

At the system interface transfer flights are particularly affected by decoding errors, because damages on the baggage label during the transport through the

BHS or by the secondary processes cannot be excluded.[320] The information stored in accordance with the IATA-standard[321] must be decoded of a barcode in a time-consuming and manual procedure and recaptured if necessary.

FIGURE 30: Baggage label

Source: own illustration

This may lead in consequence to the result that the required transfer time of the baggage is exceeded, the baggage is separated from the transfer of the passengers, and if necessary replenished at considerable cost. In order to avoid this situation German airports have largely decentralized reading and decoding units installed in the BHS. This makes a real-time visualization of the baggage possible, as well as localizing the baggage within the baggage handling process.

[320] Cf. Subchapters 8.4 and 8.5.2.1.

[321] The storage is done in the form of a 10-digit code (e.g. Fig. 30, numeric code: 0220217128).

8.5.2.4 Safety

As regards safety, the requirements for BHS have increased. Even before entering the secure airport area, extensive checks of the passengers and their hand luggage take place. Since 2003, all carried buggage must be checked for explosives and dangerous objects in addition to the hand luggage, moreover, an additional screening of the transfer baggage is also recommended (IATA, 2004: 651-652). The IATA (2004: 652) recommends a five-step screening process, which is presented in Table 22.

TABLE 22: Baggage screening process

Hold baggage screening level	Description	Following station for safe baggage	Following station for non-safe baggage
1	Automatic explosion detection system	BHS (70%)	Hold Baggage Screening level 2
2	Personnel controlled X-ray detection	BHS (25%)	Hold Baggage Screening level 3
3	Control by computer tomography / manual electronic trace detection	BHS (4.8%)	Merge of passenger and baggage
4	Passenger questioning / baggage opening	BHS (0.2%)	Destruction / disarming of the baggage
5	Destruction of the baggage		

Source: adapted from IATA (2004: 652); modified

Butz and Frenz (2003, 101-102) argue that at many airports in the meantime the security control of the baggage was integrated into the BHS, and nowadays due to the fact that also the transfer baggage is sorted in the BHS, this is also checked by the safety devices. In the first stage of the 100% baggage screening the baggage is screened automatically. In level 2 the pieces of baggage characterized

as abnormal will be checked by an X-ray screeding executed by specialized security staff. Approximately 4.8% of the pieces of baggage can be assessed in terms of their dangerousness by computer tomographic control. If this assessment not exhaustive, the passenger and the baggage will be re-united (approximately 0.2% of all baggage). In this case the baggage is opened, and the passenger is questioned, which should contribute to the clarification of the dangerous situation. Is a merge of the passenger with the baggage not possible or sufficient clarification of the dangerous situation excluded, the baggage will be destroyed in order to reestablish security.

8.5.2.5 Baggage claim

Arrival passenger baggage is unloaded from the aircraft and usually transported by trolley to designated places in the BHS. There is usually a separation of the baggage in transfer baggage and baggage that needs to be provided to the arriving flight passengers. The transfer baggage will be stored in defined places in order to enter into the BHS again in order to be re-sorted. Scheimann (2005: 37-38) argues that the return of the BHS can be used for the transport of arrival baggage which can be placed unsorted on the baggage claim belt conveyors. This can be problematic in terms of baggage security and controlled and authorized access to the baggage of the passengers. Therefore, the baggage of the arrival passengers will be usually loaded to baggage claim belt conveyors. The loading station of the arrival baggage belt conveyors is located in a secured area of the BHS that is inaccessible to passengers, while the baggage claim and removal area is freely accessible for the arriving passengers, where they can withdraw their baggage from the belt.

FIGURE 31: Baggage claim conveyor, horizontal plates (a)
and central supply and sloped plates (b)

a b

Source: adapted from Vanderlande (2014)

From the perspective of the topic of this dissertation the baggage handling process at the airport is completed by removing the arrival baggage by the passenger from the baggage claim belt conveyor.

8.6 LEGAL FRAMEWORK

The comments in the following chapters deal with the general legal basis for the procurement of public contracts by referring to the topic of this dissertation. The main focus in the following is on the thematic considerations of the legal regulations of the Sector Ordinance (SektVO) and in the presentation of possible effects on BHS-manufacturers. Due to the scope and complexity of the procurement law the considerations can only be on a fundamental basis, describing the issues to be discussed with the focus on key topics at this point. Under no conditions are the considerations and the argumentation a substitute for legal advice.

8.6.1 Demarcation of terms

To obtain a better overview of the connections shown below, it is necessary to explain the use of terms in the area of public procurement. Referring to the topic of this dissertation the following terms are of relevance:

Public contractor (excerpt) are:

- Local authorities, like the federal government, federal states and municipalities and their special assets (§98 no. 1 GWB).
- Legal persons, whether governed by public or private law, if these have been established for a specific purpose, the fulfillment of needs in the general interest of non-commercial tasks, and are mostly financed by local authorities or their associations and are under supervision of their management (§98 no. 2 GWB; Rehfeld, 2014: 3).
- Legal persons, whether governed by public or private law, who are active in the field of drinking water, energy supply or transport or telecommunications, if these activities are carried out on the basis of special or exclusive rights granted by a competent authority or if the contracting authority in accordance with §98 no. 1-3 GWB can exercise a dominant influence on these persons, individually or together (§98 no. 4 GWB; Weyand, 2007).

Public contract: According to §99 (1) GWB public contracts are defined as public procurement contracts between public authorities and firms and contain work, supply or service contracts for remuneration.

Supply contracts: According to §99 (2) GWB supply contracts are defined as contracts for the procurement of goods, in particular related to purchase, lease or rental. Rehfeld (2014: 4) states that an inclusion of contracts for which no clear assignment can be made is also possible.

Public works contracts: According to §99 (3) GWB this is pursuant to contracts either about the execution or the simultaneous planning and execution of works or a construction, or the outcome of building or civil engineering and is intended to ensure an economic and technical function or about a work according to third party requirements. Rehfeld (2014: 4) argues that due to the width of the definition, all forms of construction (e.g. work concession, new construction, alteration, repair, demolition, etc.) are included.

Service contracts: According to §99 (4) GWB this defines all public contracts that neither include work nor delivery services.

Mixed contracts: According to §99 (7); (8) GWB these contracts contain multiple achievement types, so that a classification of the kind of contract must be done based on the thresholds. According to §99 (8) GWB the major part of the contract is decisive for the classification.

According to §98 no. 4 GWB, commercial airports are classified as contracting authorities. HFK (2012: 9) state that this applies particularly to the provision and operation of airports for the purpose of supply of transport firms in the aviation sector by airport companies, if they hold a permit according to §38 (2) no. 1 Air Traffic Licensing Act (LVZO).[322] Therefore, for airports as contracting authorities the Ordinance Regulation (SektVO) and the fourth part of the German Act against Restraints of Competition (GWB) have to be applied for the award of public contracts (Weyand, 2009: mn. 4977).[323] Weyand (2009: mn. 4979) points out that in implementation of the Directive 2004/18 / EC[324] the application of the Procurement Ordinance (VgV) with the obligation to apply VOB/A, VOL/A, and VOF is mandatory for all other classical public authorities within the meaning of §98 GWB. The purpose of this scheme was to make the arrangements easier to apply for a range of sector applications, as well as legally secure and less vulnerable for review procedures (Weyand, 2009: mn. 4977).

8.6.2 Basic relationships of the legal basis

The European Union joined the General Procurement Agreement (GPA) of the World Trade Organisation (WTO) as of 1 January 1996. The GPA represents an international and plurilateral agreement between parties of the WTO and regulates the access to public contracts (BMWi, 2015). The term of public contract

[322] Cf. BGBl (2008), part 1: 1229, publication 10.07.2008.

[323] Contracting authorities that are active on markets with direct competition (§ 3 (1) SektVO) are not covered by the SektVO.

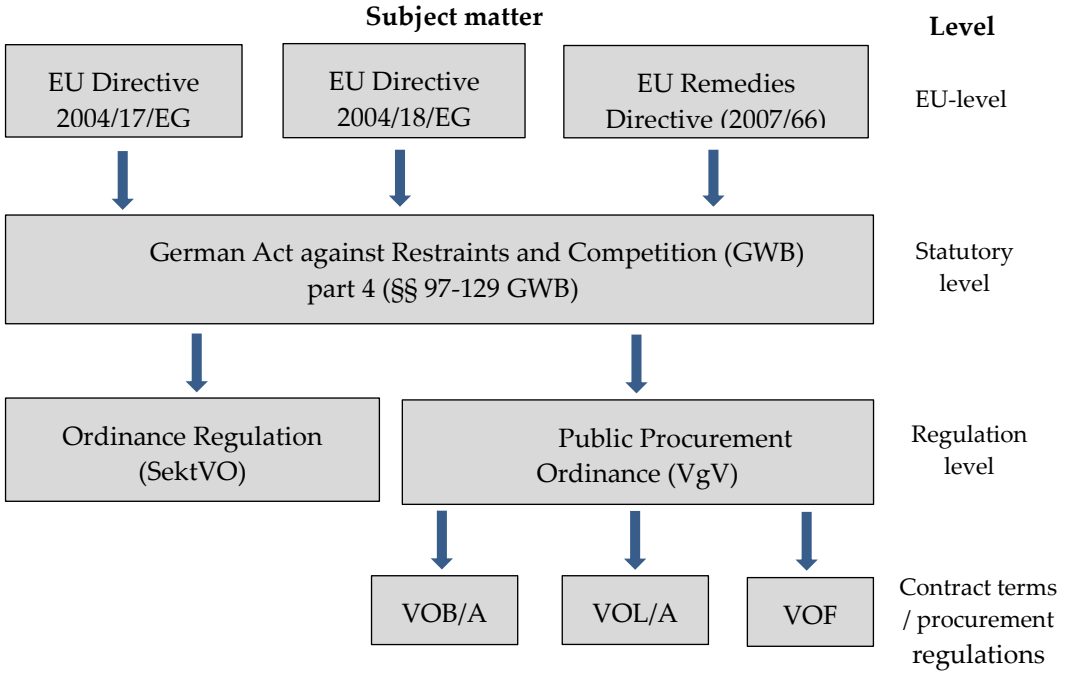
[324] Cf. Subchapter 8.6.2 in detail.

is defined in §99 (1) GWB and includes pecuniary procurement contracts[325] between public authorities and firms which contain works, supply or service contracts. The application of the agreements stated in the GPA is controlled by thresholds[326] that have to be applied on contracts for works, supplies and services (Ferber, 2015). The thresholds mark the estimated total remuneration excluding VAT but including any options or contract extensions (§2 (1) SektVO). The provisions of the GPA generally apply to all public contracts above the thresholds, but not to jobs that according to §100 (2) GWB are not subject to EU Public procurement Directives (BMWi, 2012). The general scope of application of the GPA is determined under Article 1 (1) in Appendix 1 (BMWi, 2012). Annex 1 to Appendix 1 of the GPA refers to all supreme federal authorities, Annex 2 refers to the general definition of the EU directives with reference to the public contracting authorities covered by the directive, which has been implemented in § 98 no. 1-3 GWB in German law. Annex 3 lists the sector contractors detected by GPA, while Annex 4 captures services detected by the GPA and Annex 5 characterizes the collected works (BMWi, 2012). Figure 32 presents an overview of the regulations of EU public procurement law in conjunction with the appropriate levels of regulation.

[325] Contracts of contracting authorities that are based on a procurement process are excluded from the application (e.g. rental of immovable property, sale of goods, etc.).

[326] Ferber (2015) states that the threshold values are given in Special Drawing Rights (SDRs), which is an artificial currency unit created by the International Monetary Fund (IMF) for the period of 2011-2015, a weighting of the US dollar (41.9%), EURO (37.4%), yen (9.4%) and pound sterling providing (11.3%) and is specified in the guidelines of the European Union in EUR (EURO).

FIGURE 32: Regulatory measures of public procurement law



Source: adapted from Burgi (2012); Trautner (2010); modified

The basis of the rules at EU-level is Directive 2004/17/EC (procurement in the water, energy, transport, and postal services sectors) and Directive 2004/18/EC procurement contracts for public works, public supply and public service)[327], where thresholds for the application of contract award by the contracting authority are defined, which entered into force by means of the Commission Regulation (EU) No. 1336/2013 on 1 January 2014 (European Commission, 2015).

Both provisions describe the principles according to which to act in the frame of public awards. Weyand (2009: mn. 4976) states that the Directive "2004/17/EG regelt den Mindeststandard für die Verfahren zur Vergabe öffentlicher Aufträge mit dem Ziel, in allen Mitgliedsstaaten grundsätzlich

[327] The currently valid public procurement Directives 2004/17/EC and 2004/18/EC remain in force until 17 April 2016 (European Commission, 2004; 2013; 2015).

gleiche Bedingungen zu schaffen".[328] Burgi (2012: 5) argues that the Directive 2004/18/EC in Article 2 points out the basic principles of equal treatment and transparency, while the principle of competition can be attributed to the various procurement provisions of the Directive.

In addition to other European directives, particularly at the national level (Figure 32, regulation level) the German public procurement law is complex. The legal basis primarily rests on the German Act against Restraints and Competition (GWB)[329], the Public Procurement Ordinance (VgV), the Ordinance Regulation (SektVO), Contracting Regulations for the Awarding of Building Works (VOB), Professional Services, the contract procedures for supplies and services (VOL), and the Contracting Regulations for the Awarding of Professional Services (VOF).

Under the topic of this dissertation the SektVO is of special importance, as this is used to „der ergänzenden Umsetzung der Vorschriften der Richtlinie 2004/17/EG"[330] (Weyand, 2009: mn. 4975), and applies to EU-wide procurement procedures above the thresholds (Spieker and Jaeger, 2009: 3; Theissen and Arndt, 2010: 2) and replaces the application of VgV (Weyand, 2009, mn. 4977) for the sector areas.[331]

Weyand (2009: mn. 4976; 4977) argues that by replacing the VgV the SektVO in Directive 2004/17/EC regulates the minimum standard of procedures for the award of public contracts in the sector area. Spieker and Jaeger (2009: 3) state that procurements below the thresholds in the sector area can be carried out free of a tender. However, the awarding authority can decide for the implementation of

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[328] Translation from GER according to Weyand (2009: mn. 4976): "2004/17/EC sets the minimum standards on procedures for the award of public contracts with the aim of creating general terms and conditions that are identical in all member states".

[329] §97 I, II GWB relates to the basic principles of procurement, §97 VII GWB relates to subjective rights, and details about the judicial review are stated in §§102-124 GWB (Burgi, 2012).

[330] Translation from GER according to Weyand (2009: mn. 4975): "the complementary implementation of the provisions of Directive 2004/17/EC".

[331] Theissen and Arndt (2010: 2) state that in individual cases the application of the SektVO below the thresholds is possible.

national tendering procedures below the thresholds.[332] Other legal bases are found in the budget law of the federal and state governments, as well as in the public procurement laws of the states.

Outside the sector area the VgV has the task to ensure the applicability of the procurement rules, and supports the basic approach of the GWB based on thresholds (Burgi, 2012: 5). Trautner (2010) states that the GWB is compellingly to apply when the expected value of the contract is above the thresholds, the client is a contracting authority according to §98 GWB and the order is covered by §99 GWB. Burgi (2012: 5) estimates that "The neuralgic point of the German procurement system, however, is that the reference by virtue of the VgV is not comprehensive. Only the provisions laid down in section 2 of the regulations of VOL/A and VOB/A are applicable for contracts exceeding the thresholds as only these norms transpose the provisions of the European Procurement Directives. Plus, the VOF is only applicable above the thresholds."

The procurement regulations VOB/A, VOL/A und VOF, which cover different contractual areas as presented above, are also of special importance for public tendering projects.[333] Burgi (2012: 5) states that these regulations do not have the same status as an Act, because they are made by procurement committees instead of the legislative. The VOB consists of three parts of which Part A-section 1 in the §§1-22 VOB/A and the Appendixes I and TS (Technical Specification) rule the general conditions for awarding construction work. Part B rules in the §§1-18 VOB/B the general contractual conditions for the execution of construction work, while Part C relates to the general technical contractual conditions for construction work (ATV) and to general rules for construction work of any kind (DIN18299) (VOB, 2012: 3-56). Burgi (2012: 5) states that "only the second parts of the VOB/A and the VOL/A as well as provisions of the VOF

[332] Cf. Subchapter 8.6.3 related to the example of the FMG.

[333] Spieker and Jaeger (2009: 2) state that the new SektVO, which came into force in September 2009, accepts and modernizes, as a separate legal regulation, the arrangements of the previous VgV and the third and fourth section of VOB/A and VOL/A, so for awards in the sector area the VgV and VOB/A and VOL/A are no longer relevant. Spieker and Jaeger (2009: 2) add that the VOF does not apply to the awarding authority.

produce external effect for above the thresholds contracts exclusively due to §§4-7 VgV. Below the thresholds, the situation is markedly different. There, the so-called budgetary situation is dominant. This means that neither the GWB nor the VGV is applicable. Plus, only the first part of the procurement regulations is employable - meaning that subjective and enforcable rights are not granted."

8.6.3 Legal classification on example of the FMG

Munich airport is one of the leading German commercial airports. With about 38.55 million passengers, it registered 59.36% growth in the period from 2003 to 2013.[334] The procurement volume of the Munich Airport Group in 2013 was at EUR 600 million, with the contracts awarded to 141 groups of goods[335] in the areas works, supplies and services (FMG, 2015).

FMG (2015) states that with this procurement volume, the Munich airport should consider a potential regional, national or international contractor in the field of airport-specific works, supplies and services, required for ensuring its logistic and economic objectives and the sustainable development of powerful, flexible and innovative suppliers and service providers. Therefore, there are numerous and sometimes long term business relationships between the Munich airport Group and local firms that are not only focused on group companies, but also cover craft firms and agricultural producers (FMG, 2015). Flughafen München GmbH (FMG) is a contracting authority according to §98 (4) GWB and active in the sector area. For FMG as the awarding authority and a contractor in the public procurement sector, in principle the SektVO with the thresholds and Part 4 of the GWB are to apply to European tenders.[336] FMG applies two procurement procedures for public procurement (FMG, 2015):

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[334] Cf. Subchapter 8.2 (Tab. 18; Tab. 19).

[335] FMG (2015) states that e.g. conveyor systems can be assigned to the group (a) vehicles, equipment and machinery, while e.g. the procurement of control technology for a BHS can be classified to the group (b) electrics, automation, process control.

[336] Cf. Weyand (2009, mn. 4977).

a) Europe-wide proceedings: When the order value is above the EU threshold, in the context of a negotiated procedure in which usually a qualification competition takes place (§101 (5) GWB).
b) National proceedings: if the value is below the EU threshold, under a formal assignment as determined by the FMG.

The decision for or against the application of the above-mentioned procurement procedure is taken in accordance with §1 (2) SektVO by FMG and the thresholds presented in the table below, which can be adapted by the decision of the European Commission.

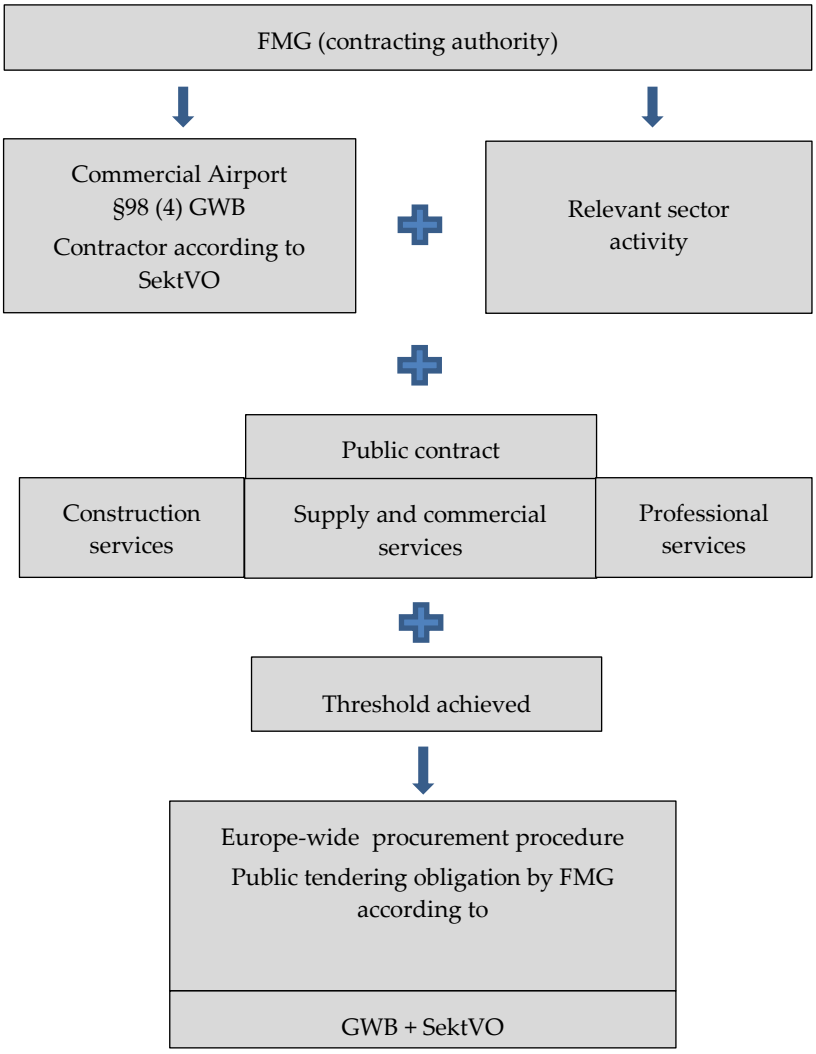
TABLE 23: Threshold per order type, valid: 2014, January 1

Order type	Legal frame	Threshold
Construction services	§1 (2) SektVO, in connection with: EC No. 1336/2013	EUR 5,186,000.00 (total order volume of the construction service)
Supply and commercial services		EUR 414,000.00 (per order)
Professional services		EUR 414,000.00 (per order)

Source: adapted from FMG (2015)

Figure 33 below shows the general legal conditions for procurement procedures applied by FMG.

FIGURE 33: Procurement procedures at Munich Airport



Source: adapted from FMG (2015); modified

Based on §97 GWB here in principle the subsequent procurement principles are to apply (FMG, 2015), which are presented in detail in Subchapter 8.6.4:

- Principle of competition:[337] It is a formalized procedure to provide many tenderers with the possibility to offer their achievements.
- Principle of transparancy: All tenderers receive the same information. The procedure is not changed during the current procurement procedure.
- Principle of equality / non-discrimination: Equal treatment of the tenderers.
- Principle of the award in lots: The awarding of orders for large projects has to be divided into partial lots. This should give SME the opportunity to participate.
- Principle of economies: The award will be to the most economical offer.

FMG (2015: 2) states that „aufgrund der rechtlichen Vorgaben für den Flughafen als Sektorenauftraggeber darf bei der Vergabe von Aufträgen kein Umlandbonus für Unternehmen aus der unmittelbaren oder mittelbaren Umgebung eingeräumt werden“.[338] Considering the purchasing volumes of FMG from 2011, it is noticeable that only 2.3% of the purchases were made abroad. The following table shows the procurement volumes in detail.

[337] According to the principle of competition the contracting firm is generally obliged to negotiate with several tenderers (OLG Celle, 16.01.2002 - 13 Verg 1/02).

[338] Translation from GER by the author according to FMG (2015: 2): "because of the legal requirements for the airport as the awarding authority no regional bonus shall be given for firms in the direct or indirect vicinity in awarding contracts".

TABLE 24: Procurement turnover of the FMG, year 2011

Area	Procurement turnover 2011 [EUR]	Share of total procurement turnover
Closer area	99,958,904	32.1%
Bavaria without closer area	71,402,744	22.9%
Germany without Bavaria	132,974,733	42.7%
Foreign countries	7,287,484	2.3%
Total	311,623,865	100%

Source: adapted from: FMG (2012), modified

In contrast to the statement above (fn. 339) the distribution of the total turnover of the purchasing activities of FMB in 2011 presented above, approximately 311,6 million EUR, shows a preference for national suppliers (42.7%) whereof the proportion of suppliers from the closer environment of the airport is 32.1%. This is equivalent to approximately EUR 100 million of the total turnover of the procurement volume of the airport.

This ratio is substantially clear in a statement issued on 17.09.2012 in an interim analysis of FMG for the procurement in the key project "Satellite". According to the interim analysis, approximately 104 million EUR of the total order volume of approximately EUR 203.5 million were placed in 24 individual orders to firms from the surrounding area of the airport (including Munich). This corresponds to 51.1% of the allocated total contract volume and a share of 39.3% in the corresponding total number of placed orders. Foreign suppliers from outside Germany only accounted for one order (1.6% of the number of contracts awarded) in the amount of approximately 2.5 million, which corresponds to a

percentage of 1.2% of the balance sheet awarded total contract volume of the project. The following Table 25 shows the values again in detail.

TABLE 25: Procurement turnorver split-off of the FMG, year 2011

Area	Order volume [EUR]	Share of total order volume	Number of orders	Percentual number
Closer area (incl. Munich)	104,037,432	51.1%	24	39.3%
Bavaria without closer area	13,006,002	6.4%	24	39.3%
Germany without Bavaria	84,036,761	41.3%	12	19.7%
Foreign countries	2,512,609	1.2%	1	1.6%
Total	203,592,804	100%	61	100%

Source: adapted from FMG (2012); modified

The distribution in Table 25 presents the total turnover of the purchasing activities related to the reporting date 17.09.2012 and shows a preference for national suppliers (42.7%); the proportion of suppliers from the closer surrounding area of the airport is 32.1% of the total turnover of the date-based procurement volume. At the time of the report 39 procurement procedures in the project "Satellite" were not yet completed, of which seven concern formal contract awards and 32 concern EU-wide tendering. Further 24 procurement procedures were still completely open. The entire project involved 124 procurement procedures at a total value of EUR 450 million.

The significant expression of preferences for national and local firms in the vicinity of the airport presented in Tables 24 and 25 can originate in longstanding trade relationships with the firms concerned (FMG, 2015). To what extent this

preference may be contrary to the prohibition of a regional bonus[339] is possibly to be clarified outside of the considerations in this dissertation.[340]

8.6.4 Procurement process

SektVO regulates the general procurement process. The applied procedures should support competition as much as possible without limiting the flexibility of the adminstration (Juris, 2013: 3, mn. 5). For the awarding authority in sectors, in particular airports, special requirements apply relating to procurement procedures. Hence, airports are exempt from the application of procurement procedures according to national law and can freely choose the procurement procedure to apply (except for negotiated procedures without publication). In this course the important point is to ensure the principles of the procurement law, as set out in §97 (1); (2) GWB, for all award decisions:[341] the principles of transparency, competition, equality and non-discrimination, economies, neutrality, considering the interests of SME and awarding to suitable firms only.

Particularly relevant is the principle of transparency (§97 (1) GWB), which obliges the airport as contracting authority to carry out the procedure according to clear specifications which are known in advance. Here the airport as the contracting authority is committed to provide comprehensive information to the tenderers (e.g. required documents, time schedule, award criteria, approval of alternative tenders, etc.) and to document the main steps of the procurement process in a written award report.

The principle of competitiveness (§97 (1) GWB) obliges the airport to enable the participation of as many tenderers in the tender procedure as possible in order to generate a wide field of competition (e.g. an open procurement procedure). At the same time it prohibits the airport from restricting the competition by legal or actual specifications. The suitability documents[342] possibly required of the tenderer in the course of the principle of transparency limits the

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[339] Cf. fn. 339.

[340] Cf. FMG (2015: 2).

[341] Cf. OLG Düsseldorf, 10.09.2009 - VII-Verg 12/09.

[342] Cf. the principle of suitability of the tenderer (§97 (4) GWB).

market to BHS eligible firms and adjusts the number of firms to those who are suitable for the participation in the contract. Therefore, this is not contrary to the principle of competition because access is not limited to the actually suitable firms.

The principle of equality and non-discrimination (§ 97 (2) GWB) obliges the airport as the contracting entity to apply the same criteria to all tenderers and to assess them according to the same criteria.[343] A preference of certain tenderers by the airport is inadmissible. It is generally also prohibited to apply awarding criteria and to use them as a basis for a additional charge if these critera are not of relevance for the profitability or suitability (e.g. payment of tariff wages, woman quotas, employment of long term unemployed people, local residency, etc.), except as required and approved by federal- or state law (§ 97 (4) GWB). Approved and applicable are those criteria relating e.g. to social, environmental or innovative aspects, if they are a in a practical connection with the procurement and stated in the tender specifications.

The principle of the consideration of the interests of SME[344] (§ 97 (3) GWB) is used to appropriately consider the participation of SMEs within their achievement portfolio. Therefore the airport can divide an order into single or partial lots, if this is useful from the economic perspective.

The principle of awarding to suitable firms only or of tenderer suitability (§97 (4) GWB) stipulates that contracts are only awarded to skilled, efficient, reliable and law-abiding firms. The suitability of a tenderer will be proven via the submission of the documents required by the airport. If an airport has established a pre-qualification system, the qualification can optionally also be proven by means of registration in the pre-qualification system of the airport (§97 (4a) GWB). This possibly simplifies the appropriate firms' participation in the competition, as the standard documents of pre-qualification processes do not have to be resubmitted. Specific customized suitability documents are not affected by this.

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[343] Cf. Figure 36.

[344] Also: Principle of awarding in lots.

The principle of economy (§97 (5) GWB) stipulates that the award is economical and not to be given to the cheapest offer. Here the price is still a criterion, but correlated with criteria such as quality, customer service, delivery and execution deadlines, etc.

Schellenberg, 2012: 1)[345] states that the principle of neutrality (product neutrality) (§7 Abs. 8 VOB/A) defines:

„(…) dass öffentliche Auftraggeber in der Leistungsbeschreibung nur in eng begrenzten Ausnahmefällen produktspezifische Angaben machen dürfen. Es handelt sich dabei um ein wesentliches Grundprinzip des Vergaberechts: Nur wenn die Leistung neutral formuliert ist, kann über deren Erbringung Wettbewerb entstehen. Das Gebot der Produktneutralität ist daher direkt der Ausdruck des Wettbewerbsprinzips gemäß §97 Abs. 1 GWB“[346]. (Schellenberg, 2012:1)

Particularly in the area of BHS procurement this is not an easy task; the technical complexity and the difficulty to describe precisely the desired performance of a system and all technical requirements constitute major challenges for the airport. Exceptions are only permitted if an achievemwent can not be described precisely and intelligibly.

The principles and recommendations addressed are also integrated in the §§20; 22; 29 SektVO. Offering companies can claim that the sector contracting authority complies with the provisions concerning the procurement procedure according to §97 (7) GWB. In the procurement practice compliance with the

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[345] Schellenberg (2012: 1) states that the OLG Düsseldorf has restricted the principle of product neutrality in several decisions (OLG Düsseldorf, 17.02.2010 - VII-Verg 42/09, OLG Düsseldorf, 03.03.2010 - VII-Verg 46/09; OLG Düsseldorf, 17.01.2011 - VII-Verg 3/11).

[346] Translation from GER according to Schellenberg (2012: 1): "Only in very limited exceptional cases may public authorities make product-specific indications. This is a fundamental principle of the procurement law: only if the achievement is formulated in neutral terms, can competition about its execution arise. The principle of product neutrality is therefore directly the expression of the principle of competition in accordance with §97 (1) GWB".

principle of transparency is critical, because this obliges the airport to provide all tenderers with the same information. Problems might occur if tenderers have developed specific solutions based on their customer and application knowledge that could technically provide a CA and be integrated into the tender documents by the airport (e.g. particularly an innovative intralogistics baggage flow).

This information is then available to all other tenderers, so that a corresponding CA is thus probably no longer existent on the technical basis of a system concept. A corresponding advantage for a BHS-manufacturer can then only arise from the information and knowledge achieved during the development phase of the innovative solution, meaning previous to the airport´s sharing of the concept with other tenderers.

Referring to the classical procurement process, Figures 34a and 34b present the general structure of a procurement procedure and the appropriate legal basis according to SektVO, without taking the special form of competitive dialogue into account. The transmission of information by electronic means, particularly in the dynamic electronic procedure, is not addressed specifically (§§5; 10 SektVO).

HFK (2012: 15) state that the following process steps are significant and characteristic milestones in a procurement project according to SektVO:

The procurement preparation contains the definition of the scope of the order as well as the estimate of the contract value[347] (§2 SektVO), the selection of the applicable type of the award procedure[348] (§ 6 SektVO); financing assurance[349] (§21 (4) 1; 2 SektVO), the notice[350] if necessary (§12 SektVO) and the beginning of the documentation[351] (§32 SektVO).

[347] Cf. in detail Part 1 SektVO.

[348] Cf. in detail Part 2 SektVO.

[349] Cf. in detail Part 4 SektVO.

[350] Cf. in detail Part 3 SektVO.

[351] Cf. in detail Part 6 Sekt VO.

FIGURE 34a: General sequence of the procurement procedure, part 1

Process step	Legal basis
Beginning of the documentation	§32 SektVO
Selection of the type of the procedure	§6 SektVO
Preparation of tender documents	cp. §§7; 8 SektVO
Public notice (Official Journal of the European Union and national)	§§12; 14; 16; 29 (4) SektVO
Participants in the competition	cp. §§14; 22 SektVO
Pre-emptive aptitude test (only restricted procedure / negotiated procedure)	cp. §§20 (2); 21; 23; 24 SektVO
Sending the tender documents (open procedure) or invitations to tender	§19 (1) SektVO
If necessary information to tenderer	§19 (2) SektVO
Timely submission of tenders	§§17; 18; 19 (3) SektVO
Opening of the tenders	Not standardized

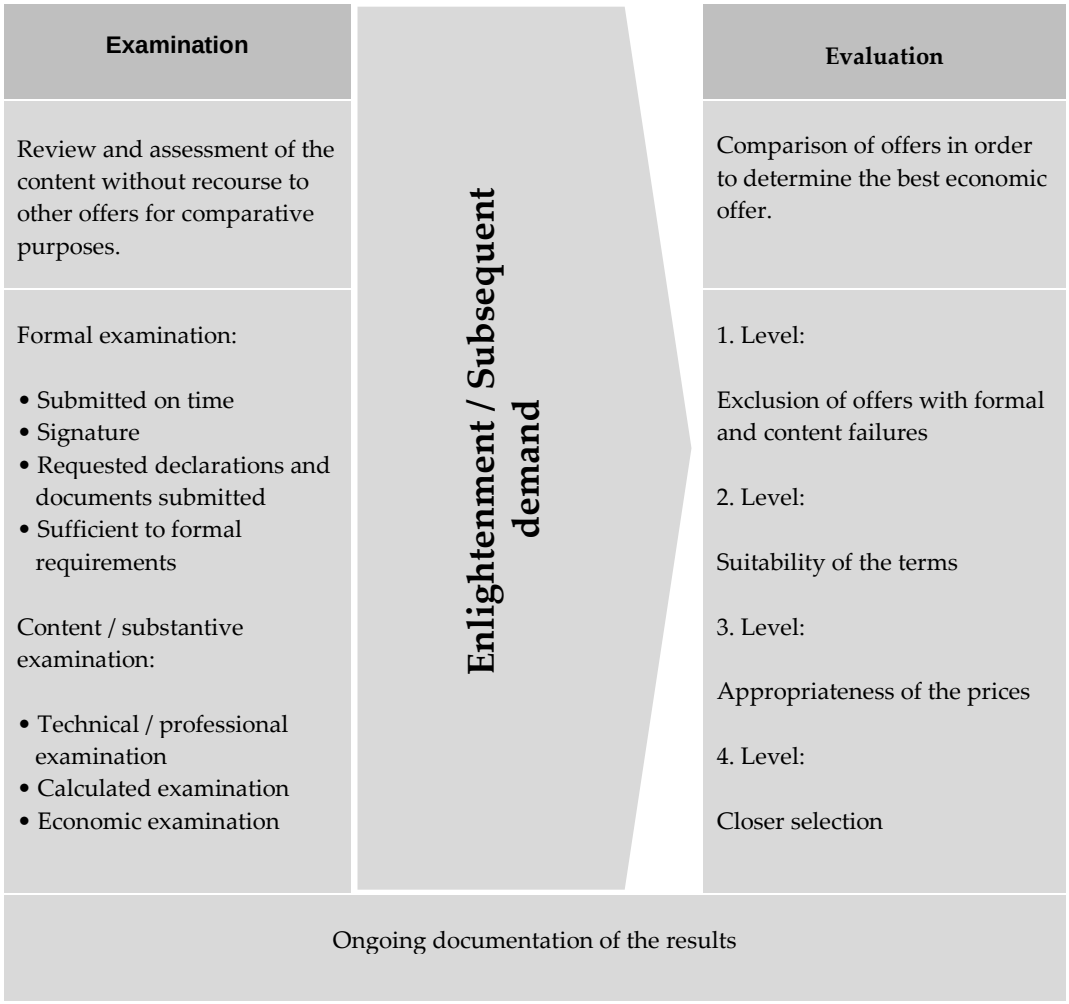
Source: adapted from HFK (2012: 13-14); modified

FIGURE 34b: General sequence of the procurement procedure, part 2

Process step	Legal basis
Beginning of the award period and validity	Not standardized
1. Evaluation stage Formal tender evaluation	§26 SektVO
If necessary additional request for not submitted declarations	§§19 (3); 27 (1); 3 SektVO
2. Evaluation stage Suitability test (only with an open procedure)	§§20, 21, 23, 24 SektVO
3. Evaluation stage Examination: abnormally low price (third-country clause)	§§27, 28 SektVO
4. Evaluation stage If necessary informative consultations / selection of the most economic offer	§29 SektVO
Internal award decision	Not standardized
Notification of unsuccessful tenderers	§101a GWB; §§29 (5); 31 SektVO
Completion of the process by award	cp. §29 (1) SektVO
or cancellation / termination of the proceedings	§30 SektVO

Source: adapted from HFK (2012: 13-14); modified

FIGURE 35: Testing and evaluation of the offers



Source: adapted from HFK (2012: 18); modified

The application phase concerns the restricted and negotiated procedure. For the application phase the contract authority may require the presentation of suitability evidence[352] by the tenderer[353] in order to be officially approved by the

[352] Cf. §§20 (2), 21, 23, 24 SektVO.

authority (§24 (1) SektVO). This can take place in the form of a pre-qualification. The contract authority must immediately specify the need for a pre-qualification known across the EU (§24 (8) SektVO) in order to ensure equal opportunities for all potential applicants. Rejected applicants have the right to information according to §101a GWB.

With concern to the restricted and negotiated procedures, the bidding phase is characterized by the invitation to tender (§25 SektVO) or the invitation to negotiate (§25 (1) SektVO. At the same time the selected tenderer receives the tender documents and any additional necessary documents (§25 (2) SektVO).

Another significant and characteristic milestone is the opening and the examination of the received offers from BHS-manufacturers as well as the additional requests for information, and other requests for further documents or information if necessary, in order to review the applications and select the best tenderer. Figure 35 presents a general exampel of the process for the examination of the tenderers' offers.

This concerns the restricted and negotiated procedure. An additional part of this phase is the negotiation with the best tenderers. Offers that are abnormally low in relation to the transaction are questioned by the contracting authority (§ 27 (1) SektVO. Abnormally low offers in relation to the transaction have to be excluded from the procedure (27 (2) SektVO.[354]

The evaluation of the tenderers' offers will be based on weighted individual criteria, in which each evaluation must be justified. The award criteria shall be communicated to the tenderers in the contract notice or in the tender documents according to §29 (4) SektVO. The SektVO states in §29 (2) SektVO examples of

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[353] Consortia can also prequalify (§24 (12) SektVO) and be registered in the list of prequalified firms of the contract authority (§24 (7), (8) SektVO).

[354] It should be noted that by the inclusion of additional EU Member States the possibly number of bidders can increase and these will use the price level that is suitable for their country of origin (possibly lower labor costs, etc.) which provides them with a location related competitive advantage. This can lead to a reduction of the average price level in the market for BHS and to a competitive disadvantage for the established manufacturers.

award criteria[355] that can be used, but also opens options for more criteria to be determined by the contract authority. As an example of a possible assessment tool the matrix in Figure 36 can be used.

According to §8 (1) SektVO an authority may permit accompanying offers deviating from the tender documents, but this must be specified in the notice or in the tender documents including the appropriate minimum requirements. By submitting accompanying offers a manufacturer can offer something that differs from the tender documents, but this alternative has to meet the minimum requirements. A BHS-manufacturer could offer a proprietary product, from which the manufacturer may promise benefits in the evaluation matrix. The different solution is then to assess accordingly and to evaluate separately. If the tender documents or the contract notice do not include an indication of the acceptance of alternative tenders they are not allowed (§ 8 (1) SektVO) and a participating firm has to offer strictly according to the tender documents.

Another significant and characteristic milestone is the preliminary information that includes the contract authorities' obligation to immediately inform the unsuccessful tenderers in writing about the name of the winning firm, the reasons for the non-consideration of the respective tenderer and the intended earliest date of the contract conclusion (§101a SektVO).[356]

[355] For example: delivery time, completion date, running costs, profitability, quality, aesthetic and functional characteristics, environmental characteristics, technical value, customer service, technical assistance, security of supply, price (§29 (2) SektVO.

[356] HFK (2012: 21) state that this also applies to tenderers where no information has been received about the rejection of their application.

FIGURE 36: Evaluation matrix to determine the best tenderer

Evaluation criteria	Weighting	Marks of tenderer		Official in charge	Weighted points
		Points (1-10)	Substantiation		
Criteria 1	50%				
Criteria 2	20%				
Criteria 3	10%				
Criteria 4	10%				
Criteria 5	10%				
↑ Each must be justified.		↑	Score tenderer X: ↓		
Then: Comparison of the total scores of the individual tenderers.					

Source: adapted from: HFK (2012: 18); modified

The conclusion of the procurement procedure can be the award[357] (§29 (1) SektVO) in whole or for individual lots (§30 SektVO). The contract authority must also inform participating tenderers about the reason for an annulment of the procedure (§30 SektVO).[358]

Finally, the contracting authority is obliged to document all process steps and the related decisions and to store all documents that are relevant for the procedures for four years after the award of the contract (§32 SektVO).

[357] After sending the preliminary information the award can be granted only after a period of 15 calendar days (§101b GWB).

[358] Exceptions related to a breach of law.

8.6.5 Procurement procedures

Sector contracting authorities may freely choose between the procurement procedures of open procedure, restricted procedure with preliminary competitive qualification, and negotiating procedure with preliminary selection of qualifications (§6 (1) SektVO; §101 (7) GWB). Here the sector contracting authority has to follow the principles discussed in Subchapter 8.6.4, especially those of transparency, equality and competition. In the following all three procurement procedures are characterized.

The open method essentially follows the procedure according to Figures 34a and 34b. (cf. Subchapter 8.6.4) and is initiated by a Europe-wide announcement (§§12; 16; 29 (1) SektVO) to promote the competition across borders.[359] The contracting authority may also contact individual firms directly, without giving them information on which other firms will or will not be invited at a later stage (principle of equality).[360]

In a case like this it is more difficult for manufacturers of BHS to achieve an advantageous position in the award process and possible in the EU-wide competition. The corresponding documentation of the respective procurement projects are provided to interested firms at their request within six calendar days (§19 (1) Sekt.VO). Additional information also has to be provided by the sector contracting authority before the expiry of the offer period, within six calendar days of the request of the interested firm, and must also be provided to all involved tenderers (§19 (2) SektVO). After opening the offers, the tenderers remain bound by their tenders, in which up to the time of auctioning four rating levels (Figure 35)[361] have to be completed until expiry of the award period, which ends with the selection of the most economical offer in stage four (§29 SektVO).

Horn (2013: 7, mn. 33, mn. 34) states that in the restricted procedure only a limited group of potential firms is allowed to participate after public request, which is mandatory in accordance with §6 SektVO in connection with §20 (1) SektVO. The formalities meet the strict formalities of the open procedure, but the

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[359] Cp. BayObLG, 04.02.2003 - Vergabe 31/02.

[360] Cp. OLG Schleswig vom 17.02.2000 - 11 U 91/98.

[361] Cf. Subchapter 8.6.4.

principle of competition is less pronounced by limiting the number of approved offers. Additionally Horn (2013: 7, mn. 35) pronounces that next to the intention to promote competition, the procedure of the call for competition pursues the objective to review the suitability requirements of the candidates in terms of performance, expertise and reliability.

The difference between the open and the restricted procedure is a two-phase method constisting of public call for competition (phase 1) and the supply and evaluation phase (phase 2). The tenderer will be selected by a formal procedure in the first phase. Although the number of entrants in the formal procedure is unlimited, the number of candidates selected and approved in relation to their suitability according to the criteria of the contracting authority is limited. The evaluation of the public call for competition ends with the selection of the firms invited to tender, while not approved firms will be excluded from the tender.[362] After the selection of suitable firms, the contracting authority can further restrict the number of suitable firms in compliance with the demand for appropriateness (§20 (1) SektVO), but has to ensure that sufficient competition §20 (2) SektVO is possible.[363] The selection of which and how many firms will be invited to tender must be made on the basis of objective and verifiable reasons and must be properly documented by the contracting authority.[364] In phase 2 the tenders shall be submitted to the contracting authority in order to assess and evaluate the offers. After informing the tenderers and candidates, the process ends with the award of the contract to the best tenderer (§101a GWB).

In negotiation procedures according to §101 (5) GWB, the contracting authority contacts one or more firms with or without[365] a prior public invitation in order to negotiate their purchasing needs and the appropriate contract

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[362] Cp. OLG Karlsruhe vom 15.10.2008 – 15 Verg 9/08; VK Bund, 22.02.2008 - VK 1-04/08.

[363] The SektVO lacks a specification of the minumum number of firms to invite, as stated in the VOB/A.

[364] Cp. BayObLG vom 20.04.2005 – Verg 26/04.

[365] In exceptional cases that are regulated by §6 (2) SektVO, the contractual authority may renounce on a contract notice. Due to the strong exceptional nature this will not be discussed in detail in the context of this dissertation.

conditions.[366] These firms have been selected by the contracting authority in advance and it is in the context of the negotiation procedure to select the most suitable firm. This process is also characterized by two separate phases, first is the selection phase (phase 1) and second is the negotiation phase (phase 2). Phase 1 is characterized by the contracting authority´s selection of a limited number of firms to tender,[367] so that a suitability test according to §20 (2) SektVO of the selected firms[368] can be carried out in advance and not in combination with the final evaluation according to §29 SektVO.[369]

During a negotiation procedure with a public call to competition, the contracting authority is obliged to determine the firms that will participate in negotiations out of the group of the applicants, but also has the opportunity to nominate or to include suitable firms as participants in advance.[370] The contracting authority has to ensure that the number of admitted candidates ensures competition (§20 (2) SektVO), while at the same time a fixed number of participants is not specified, so that the contracting authority is not obliged to negotiate with all the tenderers who submit an offer.[371] At the same time the contracting authority has a certain range in the selection of firms that are registered for the negotiation procedure, in which the principles of transparency and equality must be applied. Phase 2 is the negotiation phase, which starts after the end of the offer period (between 10-24 calendar days[372]) and where the contracting authority negotiates with the tenderers in order to adapt the submitted tenders to the requirements of the tender documents (Horn, 2013: 9,

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[366] Cp. OLG Celle, 16.01.2002 – 13 Verg 1/12.

[367] A prior public notice is followed by a call for competition, which is then part of the procurement process and subsequent negotiations and carried out in a uniform process (cp. VK Baden-Württemberg, 16.09. 2008 – 1 VK 34/08– 1 VK 34/08).

[368] Selected candidates will not be eligible for entry into phase 2 of the process (cp. OLG Naumburg vom 15.01.2002 – Verg 5/00).

[369] Cp. VK Baden-Württemberg, 16.09. 2008 – 1 VK 34/08– 1 VK 34/08.

[370] Cp. EU-Directive 2004/17/EG, Appendix XIII, C, No. 15.

[371] Cp. VK Bund, 12.12.2002 – VK 2 – 92/02.

[372] Cf. in detail §17 (3) 1; 2 SektVO.

mn. 60). Essential in the negotiation process is that the object of the achievement is not fully described in the tender documents, which means that there is a certain range for adaptation in terms of technical and / or commercial nature.[373] Here, for example, the BHS-manufacturer could make technical proposals which do not appear in the tender documents, or promise to improve or optimize the technical solution specified in the tender documents.

Therefore, a negotiation process is characterized by certain dynamics, which means that the negotiating parties bring their negotiating positions closer to each other in order to conclude a clear and sufficiently specific contract, in which the sought achievement is clearly and exhaustively described[374] and the pricing and delivery terms are defined. In practice this does not mean that it is allowed to procure significantly different achievements than initially foreseen.[375]

Due to the principle of competitiveness the contracting authority is required to negotiate with several bidders,[376] but also has the possibility to negotiate with only one tenderer and to place the award directly (direct award[377]) in case of extraordinary situations (§6 (2) SektVO). Although deviations from the construction contract documents in the process are possible, the customer is bound by the principle of equal treatment and must send the same information to all bidders, to give them the opportunity to submit bids within the same time limits and with the same requirements.[378] This leads in consequence to the situation that deviations between the tenders (e.g. technical deviations) will be equalized and homogeneity reestablished between the products from different BHS-manufacturers.

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[373] For example, in a functional specification, which must meet the requirements of §7 (1) SektVO. A change in the contract documents and the offers is possible (cp. OLG Celle, 16.01.2002 - 13 Verg 1/02).

[374] Cp. OLG Düsseldorf, 02.08.2002 - VII-Verg 25/02.

[375] Cp. OLG Celle, 16.01.2002 - 13 Verg 1/02.

[376] Cp. OLG Celle, 16.01.2002 - 13 Verg 1/02.

[377] Cf. in detail §6 SektVO and §101 (5) GWB.

[378] Cp. OLG Celle, 16.01.2002 - 13 Verg 1/02.

A negotiation process can take place in several negotiation loops where tenderers can leave each loop[379] due to not being able or not willing[380] to fulfill the technical requirements or simply having no chance to award the contract due to the offered prices.[381] If in the context of a negotiation procedure an agreement with the tenderer is made, the contract will be awarded based on the last modification of the offer.[382]

HFK (2012: 15) argue that negotiation procedures without a previous process of public notice are uncommon and their applications (e.g. contracts for research and development, which are not focused on profit) are accordingly strictly regulated (§6 (2) SektVO). When applying the negotiation procedure without public participation, the contracting authority needs to provide evidence that the conditions for the adoption of this process exist.[383] Also, if the reasons for the adoption of a negotiation procedure without prior public notice are present, the contracting authority can decide for a more formal and strict procedure and therefore for a procedure with a prior public call for competition. The principle of competition supports this accordingly.

If a tender procedure with a prior public notice remains without any suitable tenders or applications, the negotiation procedure without a prior public notice is allowed (§6 (2) 1 SektVO). Horn (2013: 12, mn. 79) comments accordingly that the range of application is not only limited to failed tenders due to unsuitable tenderers, and highlights that non-economic tenders are also unsuitable and that the criterion of economic efficiency is then absent when the price-performance ratio is out of proportion. In such a case a binding to the tender documents, in particular to the specification of the achievement of the previous procedure no longer exists.[384] In this case the contracting authority has the possibility to change

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[379] Cp. OLG Frankfurt, 10.04.2001 - 11 Verg. 1/01, OLG Celle, 16.01.2002 - 13 Verg 1/02.

[380] Cp. OLG Celle, 16.01.2002 - 13 Verg 1/02.

[381] Cp. OLG Frankfurt, 10.04.2001 - 11 Verg. 1/01, OLG Celle, 16.01.2002 - 13 Verg 1/02.

[382] Cp. OLG Stuttgart, 24.11.2008 - 10 U 97/08.

[383] Cp. EuGH, 02.06.2005 - C-394/02.

[384] Cp. OLG Düsseldorf, 03.03.2010 - VII-Verg 46/09.

the original award criteria and their weighting in the new negotiation process (Horn, 2013: 12), as long as the object of the contract of the previous tender remains unchanged. Horn (2013: 12-13, mn. 84, mn. 86) points out that under the new negotiation procedure the contracting authority must then integrate those tenderers of the previous procurement procedure which are accordingly professional, reliable and efficient, if they have been excluded in the previous procedure by formal reasons.

The inclusion of other tenderers without prior public notice is prohibited, due to the risk and the possibility of abuse, i.e. that the contracting authority targets selected preferred firms.[385] As the SektVO is applied above the thresholds, the following table provides the comparison of the key principles to select the procedure above and below the thresholds for completeness.

However, if there is no binding of the sector contracting authority below the thresholds on procurement law requirements under national law (Table 26), it can carry out the procurement based on firm-internal regulations or corporate policies on public procurement based formal specifications.[386] The individual application of additional contract conditions is recognized to be a binding part of the contract in addition to the completed tender document with unit prices,[387] and their non-recognition may result in a exclusion of the tenderer from the process.[388]

[385] Cp. OLG Bremen, 03.04.2007 - Verg 2/07.

[386] Cf. Subchapter 8.6.3.

[387] Cf. Flughafen Düsseldorf GmbH (2013: 1-2, pt. 3.1.2).

[388] Cf. Flughafen Düsseldorf GmbH (2013: 2, pt. 3.1.7).

TABLE 26: Procurement procedure at sector activity

Below thresholds	Above thresholds
• No public procurement requirements under national law • Binding to domestic market principles (EU Primary Law) • Information from the European Commission about the interpretation of contracts that do not or only partially fall under the public procurement directives (Amtsblatt der Europaeischen Union 2006) • Bonding dure to firm-internal regulations or corporate policies[389]	• Early selection of the procedure (except for negotiation procedure without public notice) • Group privilege for affiliated firms[390] • Service concessions and construction concessions are excluded from the scope of public procurement law • Exemption from the application of the procurement law in full developed competition

Source: adapted from HFK (2012: 13); modified

Due to the high density of regulations contracting authorities in general use the procurement orders VOB/A, VOL/A, and VOF as basis for additional contract conditions.[391]

8.6.6 Specifications and technical requirements

§7 SektVO, which contains the rules for the achievement specifications and technical requirements, is of particular importance for the award of contracts in the sector area and for the examined subjects. Accordingly the airport as the sector contracting authority is obliged to describe the requested achievement

[389] Cf. Subchapter 8.6.3.

[390] Cf. Subchapter 8.6.3.

[391] The contracting regulations VOB, VOL and VOF are mentioned here for completeness; due to the application of the SektVO they are not included in the considerations.

clearly and exhaustively with the objective so that „alle Bewerber die Leistungsbeschreibung im gleichen Sinne verstehen müssen und miteinander vergleichbare Angebote zu erwarten sind (Leistungsbeschreibung)“ (§7 (1) SektVO).[392]

The technical requirements are set out in the specification and the description of the functional and achievement requirements (§7 (3) 2 SektVO) are to be formulated on the basis of common technical specifications (§7 (3) 1c SektVO) so that every reference has to be marked additionally with the words "oder gleichwertig”[393] (§7 (3) 1 SektVO).[394] Another basis are national standards concerning the implementation of European standards and European technical approvals (§7 (3) 1a; 1b SektVO).

Common technical specifications according to §7 (3) 1c SektVO also guarantee equal treatment of the participating firms according to §97 (2) GWB.[395] But if all manufacturers of products offer products to a common specification, homogeneity arises in the achievements offered to the sector contracting authority.

In this case the manufacturer of a product is no longer able to sufficiently distinguish himself from competitors by divergent product-related achievements (product homogeneity). If the specification of a manufacturer’s achievements differs from the specification set by the contracting authority as the basis for all quotations, the manufacturer of the achievement has to convince the sector contracting authority about the equivalence (e.g. by certificates or test reports of approved institutes, audit reports, etc.) of the offered achievements (§ 7 (7)

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[392] Translation from GER according to §7 (1) SektVO: "all candidates need to understand the terms of the achievement description in the same sense so that tenders are to be expected that are comparable to each other (specifications)".

[393] Translation from GER according to §7 (3) 1 SektVO: “or equivalent”.

[394] The application of international technical standards and technical reference systems are integrated if they have been drawn up by European standardization authorities or, if these do not exist, are relevant national standards, national technical approvals or national technical specifications (§7 (3) 1d SektVO).

[395] Cf. Subchapter 8.6.4.

SektVO). In such a case, it may be that evaluation of the equivalence of a different technical solution by the airport as the contracting authority is subject to a certain discretion and therefore the recognition or denial of equivalence be related to a considerable risk for the offering firm. This can lead to the situation that an offering firm will barely risk the own disqualification based on a non-standard specification. It is not allowed to the sector contracting authority to refer in technical requirements to „eine bestimmte Produktion oder Herkunft oder ein besonderes Verfahren oder auf Marken, Patente, Typen oder einen bestimmten Ursprung, wenn dadurch bestimmte Unternehmen oder bestimmte Produkte begünstigt oder ausgeschlossen werden“[396] (§ 7 (11) SektVO). The sector contracting authority may use such references exceptionally, „wenn der Auftragsgegenstand andernfalls nicht hinreichend genau und allgemein verständlich beschrieben werden kann; die Verweise sind mit dem Zusatz „oder gleichwertig“ zu versehen“[397] "(§7 (11) SektVO).

Such differences may be possible, but due to their equivalence they allow no deviation from the specifications. That means that an achievement that is recognized and agreed by the contracting authority as equivalent is still within the specification and maintains the appropriate product homogeneity of the offered achievements.

As a consequence, BHS-manufacturers therefore offer on the basis of a certain product homogeneity, which prevents a product-specific differentiation between them. The manufacturer can provide serious deviations from the description of the achievement in the form of alternative tenders, insofar as this has been communicated by the awarding authority in advance in the public notice and is explicitly allowed (§8 (1) SektVO).[398] Only this way can a

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[396] Translation from GER according to §7 (11) SektVO: "a specific make or source or a particular process, or to trade marks, patents, types or a specific origin, if certain firms or certain products were favored or excluded".

[397] Translation from GER according to §7 (11) SektVO: “if the contract cannot be otherwise sufficiently precise and intelligible, the reference shall be accompanied by the words ‘or equivalent’ ”.

[398] Cf. Subchapter 8.6.4.

manufacturer then stand out from the competition through product-specific benefits in order to achieve a CA.

8.6.7 Legal uncertainty as a chance to achieve competitive advantages

In the previous chapters, the legal framework for awards in the sector area was discussed. A major focus of the legal framework is on ensuring the procurement principles[399] in accordance with the rules stated in the GWB for both the BHS-manufacturer and the airport as customer or sector contracting authority. The application of the law is intended to make the procurement process more efficient, more transparent and more reliable and shall contribute to the reduction of transaction costs for all involved parties.

Practice often differs. In particular, the application of national law firms is often faced with problems. Dicks (2011) argues that several levels of the national law have to be adjusted, especially the diverging procurement regulations.[400] In practice it is an "inspector´s law", which due to its complexity only enables specialists, such as lawyers, to handle the regulations without failure, which in practice - especially for SME – is nearly impossible (Dicks, 2011). Furthermore, Dicks (2011) states that the regulations are in practice often applied mistakenly through misinterpretation of the rules, a lack of knowledge and limited resources, which leads to delays, permanent failures, and significant transaction costs. Continuing this argumentation he comes to the conclusion that on the basis of the national level, i.e. beneath the threshold values, the procurement law is quite efficient and could affect the principles of competition, equal treatment, and transparency, which is limited by the ignorant jurisdiction.[401] As an alternative to the procurement law Dicks (2011) mentions the threat to place orders by customers on an arbitrary basis. The participating enterprises face a risk of insufficient legal protection in case of mistakes within the procurement

[399] Cf. Subchapters 8.6.3 and 8.6.4 for details.

[400] Heinz-Peter Dicks is Presiding Judge at the High Court and chairman of the Senate and the second award Antitrust Division of the Higher Regional Court (OLG) Düsseldorf (Vergabeblog, 2011, September 18).

[401] Cf. Vergabeblog (2011, September 18).

procedure, with the possible result of not being awarded the project at the end. Due to the fact that the enterprise with the most economic offer will get the order cost decreasing measures are often necessary, for which enterprises need the related personnel and financial resources. Free-hand (direct) procurement procedures beneath the threshold might lead to a steering of orders to preferred suppliers and to an entry barrier for enterprises which are not among those preferred. Another problem in practice arises by product-specific procurement requirements, which enable the institutional client to pre-select the bidding companies in advance of the procurement procedure. According to Dicks (2011) the current jurisdiction in Germany does not presents homogeneity on this issue, so that institutional clients are not clear about the right procedure to apply.[402] The inhomogeneity of the existing jurisdiction is expressed in the sample of product neutrality, which is the basis for competition in accordance with §97 (1) GWB. Schellenberg (2012: 1) argues that contrary to the original jurisdiction[403] the OLG Düsseldorf[404] deems „eine Einengung des Marktumfeldes auf wenige oder nur einen Anbieter, ohne dass der Auftraggeber zuvor eine Markterkundung durchführen muss, für zulässig“[405].

Schellenberg (2012: 1) argues that the corresponding decision must be related only to objective and achievement-related reasons and not to discrimination of one or more firms. Schellenberg (2012: 1) further argues that this also means that the OLG Düsseldorf is conflict with judgments by other OLGs that consider a commitment to specific products as admissible only under the

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[402] According to the judgment of the OLG Düsseldorf (OLG Düsseldorf, 17.02.2010 - VII-Verg 42/09), the award is acceptable to a tenderer that presents only one offer. In contrast, the Karlsruhe Higher Regional Court (OLG Karlsruhe, 21.07.2010 - 15 Verg 6/10) has ruled that an award in a negotiated procedure in which only one tenderer remains is not allowed if the contracting authority has not sought another potential tenderer in Europe.

[403] Cp. OLG Düsseldorf, 04.2005 - VII Verg 93/04.

[404] Cp. OLG Düsseldorf, 17.02.2010 - VII-Verg 42/09.

[405] Translation from GER according to Schellenberg (2012: 1): "a restriction of the market environment to a few or only one supplier, without a previous market survey by the contracting authority, as admissible".

condition of a previous (European) market survey and under the requirement of a corresponding documentation (Schellenberg, 2012: 2), which is not considered necessary by the OLG Düsseldorf.[406]

The conflict potential of these conflicting decisions caused uncertainty among users in procurement practice, and reinforced the lack of protection for manufacturers, who are then the victims of the misinterpreted legislation. The principle of obtaining procurement autonomy, which determines how the procurement subject is to be described, but not what a contracting authority client has to procure, is crucial for the conflict.[407]

In the legal literature this decision has triggered a dispute as to the pros[408] and cons[409], which continues to date. While the proposition is based on an argument in favor of a reduction of bureaucracy, the counter-position arues that safeguards are circumvented which should just act against a restriction or exclusion of competition. But the principle of equality and non-discrimination without an objective reason is not sufficient to be applied effectively (Antweiler, 2011: 306-326; Probst and von Holleben, 2012: 1-5).

Schellenberg (2012: 3-4) provides a view into the procurement law practice and notes that nearly every major contracting authority at least has its own procurement department, which receives procurement needs formulated by the users through procurement messages, which usually also contain procurement recommendations.

Here specific procurement recommendations arise due to the high specialization and division of labor between the user and the procurement department, so that it can be assumed that the user of a specific product is aware of the supplier market and the available technical standard solutions and is already able to evaluate it in advance of the procurement. Schellenberg (2012:.3)

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[406] Cp. OLG Jena, 26.06.2006 - 9 Verg 2/06; OLG Karlsruhe, 21.07.2010 - 15 Verg 6/10.

[407] Cp. OLG Schleswig, 19.02.2007 - 1 Verg 14/06; VK Niedersachsen, 16.11.2009 - VgK-62/2009; OLG Düsseldorf, 17.02.2010 - VII-Verg 42/09.

[408] Cf. Scharen (2009: 345-346); Frister (2011: 295-306).

[409] Cf. Probst and von Holleben (2012:1); Antweiler (2011: 306-326).

argues that the user usually receives the necessary market perspective, which is the basis for procurement recommendations, in advance of the procurement through intensive and regular sales activities of the product suppliers. Additionally Schellenberg (2012: 3) states:

"Ein professioneller Vertrieb zeichnet sich dabei zum einen durch umfangreiche Informationsvermittlung über das zu vertreibende Produkt aus. Insoweit ist die Entgegennahme von Vertriebsmaterial und das Führen entsprechender Gespräche im Vorfeld einer Ausschreibung nicht nur ein unvermeidbarer sondern geradezu ein wünschenswerter Bestandteil der Kompetenzerweiterung bei öffentlichen Auftraggebern (…) Jeder professionelle Vertrieb wird bemüht sein, über die reine Informationsvermittlung hinaus den Eindruck zu vermitteln, dass sein Produkt einzigartig im Markt sei. Der Vertrieb wird Eigenschaften des Produktes herausstreichen, die konkurrierende Anbieter nicht vorweisen können und er wird versuchen, den Eindruck zu vermitteln, dass es gerade auf diese Eigenschaften zentral ankommt."[410] (Schellenberg, 2012:3)

If the BHS-manufacturer succeeds in developing a customized solution for the customer's problem in discussions together with the customer and in advance of a call for competition, and thus to define the requirements for the characteristics of the product so that they represent, in a unique way, the technical solution of the problem of the airport, and if they were integrated in the specification or technical description of the requirements by the airport, a product homogeneity for all suppliers is formally made. However, the fact is that the BHS-manufacturer who developed the specified integrated solution together with the

[410] Translated from GER according to Schellenberg (2012: 3): "A professional seller distinguishes himself from others through extensively sharing information about the product on sale. In that regard, receiving marketing material and having appropriate discussions in advance of an invitation to tender are not only unavoidable, but even desirable parts of the extension of competence for contracting authorities (...) Every professional seller will endeavor to give the impression, beyond just providing information, that the product is unique on the market. The seller will emphasize the characteristics of the product that competing firms cannot match and will try to give the impression that these characteristics are the ones that matter most".

airport in advance of the invitation to tender has an informal CA, which refers to intangible factors such as knowledge, expertise, variables of relationship, etc.

In this case the user more or less consciously develops a preference for a BHS-manufacturer and is therefore in conflict with its procurement department, which is obliged to act according to the principles of procurement law, discussed in sub-Subchapter 8.6.4, and through an opening of the competition to achieve better economic results. Schellenberg (2012: 12) states that with its decision, the OLG Düsseldorf weakens the principles of competition and economic efficiency in favor of strongly emotionally fixed users.

This means in practice that this supposedly free space created for the contracting authority was intended to develop a simplification of the procurement practice, but actually leads to uncertainty of the procurement departments. Schellenberg (2012: 5) states that procurement departments no longer know how far they are actually allowed to go with the product-specific definition of achievements.

This situation can be used by a professional sales department to upgrade users with arguments for an internal defense of their preferred manufacturer. Observing that conflict situation Dicks (2011) refers to the necessity of decision proposals for the EuGH and BGH and recommends using the current judgment in order to finally clarify current legal cases by the competent authority that is responsible for the area where the contracting authority is located. Thus, the VK Niedersachsen has for example ruled that product-specific calls for competition can only be justified if previously European market research was carried out, which ensures that Europe-wide no other product is able to meet the respective requirements.[411]

Until a final Supreme Court decision uncertainty remains for affected airports and BHS-manufacturers. Under the circumstances described above, the combination of a BHS-manufacturer and an emotionally approached user on the customer side promises a usable CA to the benefit of that manufacturer who understands to build a symbiotic relationship with the user.

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[411] Cp. VK Niedersachsen, 27.09.2011 - VgK-40/2011; additional: EuGH, 15.10.2009 - C-275/08; OLG Karlsruhe, 21.07.2010 - 15 Verg 6/10.

9 INTERMEDIATE RESULT II

It should be mentioned retrospectively that Chapter 6 (Intermediate Result I) has already summarized the essential theoretical foundations of Chapters 2-5. Thus the necessary basis for further discussion towards answering the research question was worked out on the basis of theoretical-scientific perspectives.

On this basis Chapter 9 summarizes Chapters 7 (Customer integration) and 8 (Industrial framework) regarding the major focus relevant to the course of further investigation, and they are reconciled to the subsequent qualitative investigation.

9.1 CUSTOMER INTEGRATION

In connection with the present investigation, CI can be understood as an active form of cooperation by the manufacturer of a BHS with the airport and its agents in the role of the customer. Sandmeier and Wecht (2004: 31) argue that the airport can take an advisory as well as an active role in achievements in the process of creating a BHS. Of relevance to further investigations is the fact that the design of the BHS, as well as its manufacturing, can be customized and based on individually developed or standardized and customer-specific adapted system components. The contributions of the airport may be numerous. It may comprise for instance information and know-how in advance of the manufacturing of a BHS as well as contributions concerning how the airport can be directly involved in the manufacturing of a system and can be integrated into the internal manufacturing processes of the BHS-manufacturer.[412] Fließ (2004: 542) states that CI can thus be extended in different forms[413] over the entire process chain of the system manufacturer.

Of crucial importance are the achievement dimensions: achievement potential, achievement creation process and the achievement result. By the means

[412] Cf. Kurzmann and Reinecke (2009: 207).

[413] For example, forms between customization and standardization.

of potential factors the BHS-manufacturer signals its achievement capability (achievement potential) to the airport, which then, by means of the integration of its own factors, initiates the achievement creation process and ensures that the manufacturer of the system is clear about their demands and concrete achievements, while the achievement result corresponds to the actual BHS as the expression of the combination of achievement bundles.[414] In this context the forms of integration of the need-caused and the information-caused integration can be of particular relevance to manufacturers of the BHS, because on the one hand completed and unremunerated planning achievements or services of the manufacturer remain not used by the airport, which due to demand-related non-use of the achievements or services by the airport lead to nothing.[415] On the other hand, the airport can contribute via an information transfer on the creation of the BHS (achievement result).

Whether this is a low, medium or high level of customer involvement[416] in a single stage or multi-stage CI, it is investigated under the qualitative survey in Chapter 10 of this study. By means of the single stage CI the manufacturer can protect himself from the opportunistic behavior of the airport, but nevertheless accepts disadvantages such as information and time loss, while at the multi stage of CI the manufacturer is aware of allowing access to the airport on a basis of subordinated transaction levels in order to exclude disadvantages.

Chapter 7 discusses strategic key factors[417] as the basis for success. These must be differentiated by the manufacturer internally (e.g. understanding the needs or requirements of the airport), customer related, (e.g. reputation, knowledge, skills, etc.) and integration process related fundamentals (e.g. relationship variables). In Subchapter 7.6 the following guidelines are discussed as success factors: process orientation, avoidance of dissipation, advancement of knowledge related processes, increase of deterministic process shares, the

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[414] Cf. more in detail Subchapter 7.2.1 and Engelhardt et al. (1993: 402).

[415] The BHS-manufacturer, as the tenderer of achievements, invests in the customer´s future decision but with uncertainty concerning the return on the investment.

[416] Cf. Tab. 13 about service characteristics at different integrativity degrees.

[417] Cf. Subchapter 7.5.

increase of process awareness, and integration. The process orientation highlights the fact that the development of a customized product can begin very early; it can even commence at the sales acquisition of the customer and can be beneficial when the airport is involved as soon as possible in the product development, at least by means of the transfer of know-how.[418]

The avoidance of dissipation was differentiated in the further course in value-added and non-value added activities, in which the focus was on customer benefits. Another aspect of the guidelines is on the advancement of knowledge-related processes to gain access as soon as possible to project-related and achievement-determining information and to be able to align the corresponding processes accordingly.

The discussion of the increase of process shares showed that intangible relation-specific variables play a crucial and important role during the coordination of integration-related objectives, especially in the context of product homogenization.

The increase of process evidence has the goal of enabling the airport to assess its own necessary achievements for integration and to use an organizational learning process to overcome barriers related to capability and willingness and to develop a certain process awareness, so the integration partner can be integrated on a structured and systematic basis of clear rules.[419]

Finally, the discussion turns on integration, and emphasizes that particular relation-specific assets lead an integration project to a cost reduction in the value chain, and to a lower fail quota and accelerated product development, resulting in relation-specific rents.[420]

Chapter 7 concludes with a comparison of CI with other forms of customer involvement and a consideration of the chances and risks of CI. The management of sustainable inter-organizational relationships based on intangible assets (e.g.

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[418] Cf. Subchapter 7.6.1 and Zernott (2004: 66).

[419] Cf. Subchapter 7.6.5 and Fließ (1996: 94).

[420] Cf. Subchapter 5.3.1 and Dyer and Singh (1998: 663-664).

knowledge and know-how as unevenly distributed resource) in order to achieve a CA and supernormal relational rents are exposed as chances.[421]

As risks can be specifically identified, the insight into the value chain of the BHS-manufacturer (e.g. in the composition of cost items, pricing, product calculation, etc.) and the possibility of opportunistic behavior by the airport and / or (especially in multi-stage CI) of sub-suppliers related to earlier transaction levels can consequently lead to failure of CI.

9.2 FRAMEWORK CONDITIONS

9.2.1 Technical framework

As a basis for further investigation it is relevant to obtain an overview of the complexity of a BHS.[422] In the course of this it is necessary to work out how such systems are related to other achievement elements of an airport and how they cooperate with these in order to make the airport operate successfully for its customers. Therefore chapter 8 provides in the technical framework an overview of the technical conditions, starting with the classification of the task of baggage handling in the airport. This continues in Subchapter 8.5 with the process chain of baggage handling (starting at the check-in) and the discussion about achievement-determining system components and processes, and ends the process chain with the hand-over of the baggage to the flight passenger.

Regarding German airports, it has calculated that passenger numbers for the years 2010-2014 show a slight increase, while the numbers of flights developed at a comparatively lower rate. This reflects the trend for increasing seating capacity per flight. This inevitably affects the logistical core processes of the airport and in particular the core process of baggage handling, which is a key factor for the competitiveness of the airport as presented in Subchapter 8.4.

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[421] Cf. Subchapter 4.2.2 about core competences and cooperation and Subchapter 4.3.3 about resource immobility, and Zimmer (1999: 122-123).

[422] Cf. Subchapter 8.4 (Fig. 13) and Subchapter 8.5 (Fig. 15).

Five out of 17 of the considered airports operate above the capacity limits of their BHS.[423] This leads to the conclusion that 29% of the considered airports operate their BHS under difficult conditions and rely on operational efficiency in the execution of all baggage conveying related processes. Therefore the applied subsystems must be matched to each other in order to ensure that the processes run nearly frictionless and without interruption. On the other hand the operation of the BHS is above capacity limits associated with risks, which results, in the case of a system error, to a complex failure of the baggage logistics processes and thus may result in an interruption of the core processes of the airport, or misdirecting the baggage. The economic damage at the airports under consideration to be approximately USD 255.1 million, which clearly reveals the importance of this fact for the economic success of these airports. This leaves the manufacturers of BHS with the need for the expansion of existing systems as part of capacity adjustments and / or a new concept for airport specific baggage handling processes. Due to the complexity of the systems and processes both the BHS-manufacturer and the airport are dependent on interaction and collaboration in order to implement the necessary requirements.

9.2.2 Legal framework

For answering the central research question of whether CI for German manufacturers of BHS is suitable for the achievement of CAs, the legal basis of awards of public contracts in the airport sector is of crucial relevance. Chapter 8.6 provides an overview of the legal framework and its classification with other legislation related to procurement law.

On the basis of the German Act against Restraints and Competition (GWG) the legal bases which apply to the airport sector are clearly demarcated against other applicable public procurement guidelines. Airports as contracting authorities include the SektVO and GWG, while for all other public sector contract awards VgV needs to be applied (Weyand, 2009: mn. 4977). There is also the question of whether an airport is required to carry out a procurement project, either European or national, linked to exceed certain threshold values. Above a

[423] Cf. Subchapter 8.2 (Tab. 19).

certain threshold an obligation to European tender exists, while below the threshold the contracting of any public procurement cases can be carried out according to national law, but faces a possible binding on the basis of corporate policies.[424]

Figure 33 (Chapter 8.6.3) shows this by using the example of the Munich Airport, whereas the general process of an award procedure is described in Chapter 8.6.4. There Figures 34a and 34b present the general process according to SektVO and connect the complex process steps with the related legal basis. The process steps all commonly ensure that the principles of procurement law are respected, in particular the principle of transparency, the principle of competition, the principle of equality or non-discrimination, the principle to consider the interests of SME, the principle of the allocation of suitable firms, the principle of economics and the principle of neutrality all need to be considered (§97 (1) GWB).

The principle of equality or non-discrimination deserves a particular mention; this obliges the airport to evaluate all tenderers according to the same criteria, while the principle of transparency[425] and the principle of the assignment of suitable firms that the airport enables in order to exclude unsuitable tenderers from the tendering process. Of particular importance is the principle of economics, which states that an award shall not be made on the least costly but on the best economic offer.

It is the contracting authority`s (airport) assessment that decides which of the offers is economical or not. This means that there is no uniform regulation installed and for the airport to remain viable it is allowed to enforce its own interests. Crucial for the investigation of this issue is the principle of neutrality, which dictates product neutrality and allows deviations in favor of product-specific information only in very limited and exceptional cases. The legislator thereby assumes that only from the perspective of a neutrally formulated achievement can competition requirements arise concerning the manufacturing of a product.

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[424] Cf. chapter 8.6.4 (Figures 34a and 34b).

[425] On presentation of appropriate documents of suitability or by the participation on a pre-qualification system.

Concerning BHS this means a neutral and free of product-specific characteristics and information formulated achievement specification, as well as homogeneity of the products. As a consequence of this manufacturers may not differentiate by product-specific features. Schellenberg (2012: 3) argues that despite clear evaluation criteria (Figure 36) for determining the best tenderer get criteria more significance, which are of unofficial nature and by emotional and relational factors significantly characterize the differences between tenderers. This will be supported by increased system complexity and the specialization of the technical and procurement-responsible departments. Regarding legal uncertainties, an application of procurement and sector related law, supported by controversial decisions and a lack of homogeneity of the decisions of the Public Procurement Tribunal. In the course of this growing uncertainties at contracting authorities and manufacturers is the result.

10 EMPIRICAL INVESTIGATION

Based on the previous argument it is clear that under the specific conditions of the baggage handling industry intangible factors may have a significant impact on the achievement of CAs to generate economic rents. In contrast to this, tangible factors become less important. This study aims to investigate and to confirm or refute whether the stated specific conditions for German manufacturers of BHS are suitable and useful for achieving a CA for the customer.

Therefore the methodological foundations of the investigation are presented in Chapter 10.1, while Chapter 10.2 presents the underlying guidelines. The selection and description of the samples are carried out in Chapter 10.3, while Chapter 10.4 deals with the evaluation of the results to be interpreted in chapter 10.5. Chapter 10.6 compares the expert groups 1 and 2 according to similarities and differences. Chapter 10.7 interprets the findings related to the ex-ante phases of the project to the decision, point of decision and ex-post of the decision.

During the further proceeding the terms “shows”, “presents” or similar are used for the evaluation, discussion and interpretation of frequencies. These terms are only related to the evaluation on hand related to a selected group of experts and are not to understand as a generally valid statement (see also Subchapter 1.3).

10.1 METHODOLOGY

To investigate the hypothesis that CI for the manufacturers of BHS can be a suitable instrument for achieving a CA, the present study has chosen a qualitative pproach in the context of a content analysis[426] in order to consider the size of the sample.[427]

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[426] Berelson (1952: 18) defines that “Content analysis is a research technique for the objective, systematic and quantitative description of the manifest content of communication”. Based on that definition Mayring (1993: 11-12) states that the

Therefore all selected experts[428] of the industry were interviewed by telephone and by using a semi-standardized interview guideline.[429]

The analysis method used in this case was that of frequency analysis (Mayring, 1993: 14). In preparation of the interview a previous and detailed telephone discussion with all experts was held in order to introduce and present them with the dissertation project, the interview structure and the guidelines, as well as to ask for their support. Following this the guideline was provided and available to the experts in writing in order to allow them the opportunity of a guideline check concerning its juridical neutrality. During the interview the experts' answers were recorded and after this anonymously transcribed.

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subject of the content analysis is communication, so that it works with text, images, marks, with symbolic material and has to proceed systematically. This systematic procedure reflects the fact that the analysis follows specified rules, which make the analysis and its procedure understandable for other interested parties. Mayring (1993: 11-12) continues that a good content analysis uses social science methods and standards and is based on theoretical principles, analyzing the material under a theory of reported questioning. Mayring (1993: 11-12) states additionally that a good content analysis interprets the results by the relevant theory background and guides the individual analysis steps by theoretical considerations, providing statements about the material to be analyzed in order to derive conclusions about certain aspects of the communication that include statements about the sender and his intentions and considers also the related effects on the receiver.

[427] Cf. Subchapter 10.3 for a detailed description of the sample.

[428] Cf. Subchapter 10.3 for the definition of the term expert.

[429] Aghamanoukjan et al. (2009: 417) states about qualitative interviews: “Meist handelt es sich um persönliche, mündliche Formen der Befragung, es sind aber auch telephonische oder sonst wie technisch unterstützte qualitative Interviews denkbar“. Translated from German according to Aghamanoukjan et al. (2009: 417): "Most of this these personal, oral forms of the survey, but there are also telephonic or otherwise technically supported qualitative interviews conceivable".

The procedure of the present qualitative content analysis involves the deductive[430] definition of categories that can be, if necessary, inductively adapted in the course according to the response text. The procedure is broadly in line with the methods described by Mayring (1993). As an analysis stage for the category formation a compound selected from the structuring and summary was chosen. The structuring may be associated with the deductive approach and the summary with the inductive approach (Ramsenthaler, 2013: 30-31). Both methods „(…) schließen sich nicht aus, sondern können in *einer* Inhaltsanalyse verwendet werden“[431] [cursive letters in the original] (Ramsenthaler, 2013: 32).

This approach was chosen in order to support the open character of a qualitative survey and to capture the authentic perspectives of the experts[432] and

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[430] Ramsenthaler (2013: 29-30) argues that the deductive approach begins with the theory-based definition of categories, anchor examples and coding rules and the pre-forming of the category system top-down applied to the investigation material. Ramsenthaler (2013: 29-30) argues further that the inductive approach on the other hand develops the categories bottom-up from the investigation material outwards, and that the level of abstraction, the encoding, context and evaluation units will be defined in advance, while the investigation material will be summarized and the categories derived therefrom. Mayring (2001) states that the inductive development of categories tries to refine the evaluation criteria out of the material and follows a process model in which the central criteria are to define the selection criterion, the step-wise treatment of the material and the revision of new developed categories. Mayring (2001) also states that through the deductive application of the categories the formulation of clear mapping rules related to a theoretically developed set of categories is possible, and that they determine the conditions of a text mapping to a certain category.

[431] Translation from GER according to Ramsenthaler (2013: 32): "(…) are not mutually exclusive, but can be used in *one* content analysis" [cursive letters in the original].

[432] “Menschen denken, fühlen und handeln immer auch auf der Grundlage subjektiver Bedeutungen“ (Mayring, 1995: 34). Translation from GER according to Mayring (1995: 34): “People think, feel and act always based on subjective meanings ".

thus to be able to support and to open up access to the content that may not have been captured in a quantitative approach.[433] This perspective is an essential characteristic of qualitative research. Flick (2005: 19) states that an essential and basic idea of this perspective is to make communication between the researcher and the participants an integral part of the knowledge. The individual perspective of the experts has also emerged under specific conditions, so that a query using a quantitative approach breaks the analysis item down to variables that do not appear effective or purposeful. Mayring (1993: 18) states in this context of a veritable "dismember" of the analysis item.

Specific understanding of the subject and method of qualitative research leads to the result that the investigation object is the reference point for the selection of methods and is examined in its entirety and complexity in the everyday context. Flick (2005: 17) argues that it is thereby an aspect of qualitative research to discover new things instead of checking known facts. Flick (1995: 57) states further that the procedure can be carried out in quantitative research in a linear sequence of conceptual, methodological, empirical and also independently practicable steps, while with a qualitative approach the individual components of the research process have to be considered interdependently. In this way the method delimits „(…) explizit zum traditionellen standardisierten Fragebogen ab, erhebt also primär keine quantitativen Daten, sondern Texte“ (Aghamanoukjan et al., 2009: 417). [434]

For the qualitative study the fundamental methodological approach can be described as follows. Based on the previous chapters, priorities should be checked as to whether CI can be a means for achieving a CA for German manufacturers of BHS. The present investigation in chapters 2-9 of previous discussions have identified theoretical principles that, from the perspective of specific technical and legal frameworks, result in product homogeneity. Intangible factors may lead to CAs and economic rents for the manufacturers of BHS.

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[433] Cf. in detail Mayer (2002).

[434] Translation from GER acc. to Aghamanoukjan et al. (2009: 417): “(…) explicitly from to the traditional standardized questionnaire, so surveys are conducted primarily not on quantitative information, but on texts".

TABLE 27: Process steps and implementation

Process step	Implementation
Formulation of the research question	Is CI for German manufacturers of BHS suitable for achieving CAs?
Determination of the material sample	Selection of the experts according to groups of material
Setting up the category system	Definition of main-categories based on the theoretical discussion in Chapters 2-9 according to the topic in the guideline
Definition of categories	Definition of sub-categories based on the theoretical discussion in Chapters 2-9 according to the topic in the guideline
Determination of the analysis units (coding unit, context unit, evaluation unit)	Coding unit: word Analysis unit: opinion of an expert Evaluation unit: guideline
Coding (working through the material by the category system)	Coding and cross-checking by second rater
Allocation (finding out and comparing the frequencies)	Execution for both expert groups separately, followed by cross checking of matching categories between both groups of experts
Presentation and interpretation of the results	3-way interpretation: both expert groups and matching results

This theoretical argument will be verified by means of the evaluation and interpretation of the expert survey, the basic structure of which is based on the earlier mentioned general model of the process of the qualitative content analysis according to Mayring (1993). This is illustrated in Figure 37. Table 27 presents the applied process steps (Mayring, 1993:14) and their implementation.

Based on the theory-based argumentation, a category system was established on the basis of the content analysis rules of the analysis of the answers (deductive approach). In the further course of the work selection criteria are used to select two of panels of experts[435]. An expert group (group I) represents the manufacturer of BHS, while the other expert group (group II) represents the customers (airport).

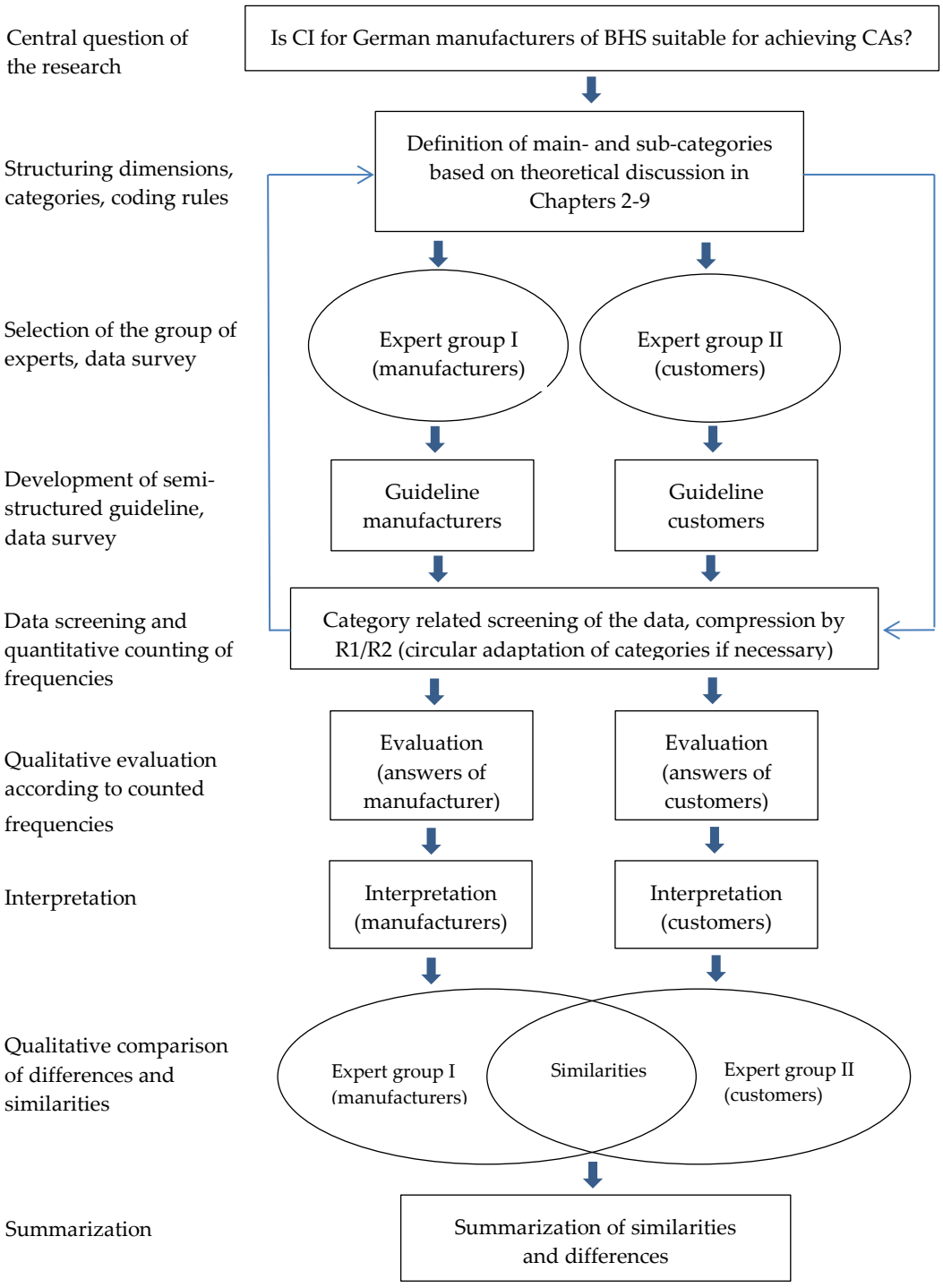
This method was chosen in order to avoid a unilateral examination and interpretation of the results and to meet the different perspectives of the experts. Concerning the problems to be examined, the groups of experts of the investigation are mutually delimited to provide a self-perspective. In order to collect the data a standardized interview is used as an analytical tool on the basis of a guideline using open-worded questions, which are screened after completion of the survey regarding the usability of the category system.[436]

It has been set that a coding unit is a word and a context unit is the statement of an expert. The evaluation units form the individual guidelines, in which all the answers based on the build categories are taken from the existing topics in the guideline and are structured and associated with each category in its various forms of response.

[435] Cf. Subchapter 10.3 for a detailed description of the sample.

[436] Cf. Subchapter 10.2.

FIGURE 37: Conduct model of the empirical investigation



Since, prior to the survey, it was not certain that the category system was applicable to the given content of answers, an iterative loop for adjusting the category system in the conduct model has been provided, and which can be repeated several times if necessary. This also allows for an inductive adjustment. In the evaluation of the conformity of the classification of the answers / coding units are entered into the category by two Raters (R1; R2). This is carried out independently. R1 is the author in R2 is another competent person. It was found that the match quality can be classified as extremely high and only minimal deviations occurred in the analysis in the less relevant areas.[437]

Due to the size and structure of the samples they were deliberately omitted from the analysis and its presentation, which used software-supported methodologies of quantitative analysis.[438] Both in the evaluation and in the interpretation of the investigation, the groups were separately considered, as well as in their intersection. Based on the consideration of the intersection, matching patterns were sought, while from the intersection falling matches deviation patterns were sought and interpreted. The respective evaluations and interpretations were carried out on the basis of the developed system of categories and the determined response frequencies and their related percentages.

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[437] See in detail Appendix I.

[438] Appendix I contains a comparison of the results of R1 and R2. Appendix III confirms that the PDF files containing the inverviews handed-over separately to the UCAM and contains the detailed R1/R2 comparision related to each question. In case of equal frequencies or insignificant deviations between R1 and R2 that does not change the expressed arguments or the intention of the experts interviewed, the focus in the further discussion is on R1.

10.2 INTERVIEW GUIDELINE

As already mentioned, an oral form of questioning was selected by means of a partly standardized and structured guideline interview carried out on the telephone. The interview was designed as a „Leitfadengespräch“[439] (Schnell et al., 1995: 352) and is based on a guide consisting of non-standardized open questions and distinguished in the course of the discussion by an open character (Keuneke, 2005: 254-255). This open character gives both the expert interviewee and the interviewer the necessary space for conversation and thus offers the opportunity of influencing the course of the discussion towards a free and open discourse appropriate for the topic. Kromrey (2000: 264) argues that this also offers the interviewer the opportunity to ask specific questions, especially when the content lacks clarity.

Mayring (2002: 66) states that the semi-standardized form of the interview refers to the procedure during questioning. Due to a requested legal review by the experts at variance with the general recommendation of Mayring (2002: 66-67), it was necessary to present the experts with an overview of the questions in advance of the interview, where the order of the questions remained open. The guideline is based on open questions that cannot be answered simply with a yes or a no (Klammer, 2005: 224-225). This encourages the expert to speak freely. Schnell et al. (1995: 330) state that at the same time it is expected that the experts will answer in their own words. Schnell et al. (1995: 353) argue that it is the objective of the guided qualitative interview to attain the freest possible expression of opinion from the expert on the topic asked and to gain some insight into its relevance structures and their backgrounds. As a communication style a soft approach was chosen in order to create an open and relaxed atmosphere. This aim was supported by the interviewee´s knowledge about the branch of the industry.

Grunow (1978: 786) states that the communication style should be as soft, „(…) wenn der Interviewer versucht, ein Vertrauensverhältnis zum Befragten zu entwickeln, indem er der Person des Befragten (nicht den Antworten) seine

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[439] Translation from GER according to Schnell et al. (1995: 352): “guided conversation”.

Sympathie demonstriert".[440] In order to create confidence a „Eisbrecherfrage“[441] (Kruse, 2009: 68) was placed at the beginning of the guideline.

Due to the deductive approach, inspired by the discussion of the theoretical aspects presented in chapters 2-9, the basis of the main categories was a guideline for each of the expert groups. The structure of both guidelines is presented in the Tables 28a-c.[442] Each main category presented was revised iteratively by text screening and sub-categories were formed. As Atteslander (2003: 160-161) describes, the final category formation and the categorization of the experts' answers then takes place in the detailed analysis of the interviews, which is in Subchapter 10.4.

10.2.1 BHS manufacturer

As described above, for the manufacturer's side a guideline was developed using the theoretical chapters previously discussed. The manufacturer's guideline side covers 22 questions and was designed in such a way that the questions can be answered generally in about 60 minutes. This period is the benchmark, agreed upon with the experts during a preliminary talk and fully endorsed by them. Tables 28a-c provide the guideline for the interview with the BHS-manufacturers.

The design of the guideline is as follows. There is no separate serial number assigned to the questions. This is in order to avoid provocation when applying the questions in order rather than in the context of the discourse with the experts. This measure ensures that the interviewer is free to ask questions in the correct order and also carries the option of combining questions.

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[440] Translation from GER according to Grunow (1978: 786): "(...) if the interviewer is trying to develop a relationship of trust with the respondent by demonstrating his sympathy with the respondent (not to the answers) demonstrated his sympathy".

[441] Translation from GER according to Kruse (2009: 68): "ice-breaker question". See also Kruse (2014) in detail about application of qualitative interviews.

[442] Cf. Subchapter 10.2.1 for more details.

For the later documentation and evaluation of the answers an internal serial number was set in order to make sure that the order of the questions could be documented as set in the conversation with the expert. Additionally, there are only a few deeper questions that could be asked in the context of the previous question. However, they could also be asked separately if a modification of the text of the question was made. Therefore the interviewer has the option to respond according to the development of the interview when the context of the experts' answers allows.

TABLE 28a: Interview guideline and category pre-definition related to manufacturers, part 1

Question	Main category	Research related goal
Please estimate the market from your point of view.	Market	trustful communication, information about industry climate
How do you differ from the competition in this environment?	Market	information about what the company believes under current conditions as differentiated from competitors.
Which of the opportunities for differentiation are in your view particularly important for a CA?	CA	identification of current drivers making the difference to competitors
What difficulties or obstacles do you see in achieving a CA?	CA	identification of more precise information about activity barriers
Who can support your company (if necessary) in achieving a CA?	CA	identification of a supporting group; these are the people to focus on
How do you gain access to the support groups?	CA	information about what is crucial for getting access to supporters

TABLE 28b: Interview guideline and category pre-definition related to manufacturers, part 2

Question	Main category	Research related goal
If you have access to the relevant people, how exactly do you proceed?	CA	further activities after gaining access
Which components are crucial for you in order to build a relationship management with the customer?	Relationship	information about most important factors to build relationships
How do you protect yourself after building a close customer relationship against the opportunistic behavior of the customer?	Relationship	information about measures to protect investments in general
How do you protect your investment from the preliminary phase of the contract?	Relationship	information on how to protect investments before receiving the award
When do you develop joint solutions or achievements with customers?	CI	achievement of process related information
At what stages of the achievement creation do you see possibilities for the integration of the customer or for the achievement of a customer contribution?	CI	information about the phase in the value chain where the customer can be integrated or is accepted to deliver achievement contributions
How would you describe participation in the provision of services?	CI	What happens if integration does not happen?
How do you motivate a customer to work with your company collaboratively? Please divide in: before, during and after the construction of the plant.	CI	Information about the drivers for customers forced by manufacturers to be motivated to become integrated.

TABLE 28c: Interview guideline and category pre-definition related to manufacturers, part 3

Question	Main category	Research related goal
What requirements are indispensable for you?	CA, CI	Deeper understanding about the necessary factors.
Where exactly do you see possibilities in your process chain for engagement and control by the customer?	CI	Where and what is the customer able to contribute?
Under what circumstances would your company would prevail with the competition?	CA, CI	What are the crucial conditions to gain a better position with the competition?
Assuming the customer agrees to their integration: how would this affect your company's performance?	CA, CI	information about the internal and external effects of the integration related to the manufacturer
How would CI affect the market success / to achieve a CA for your company?	CA, CI	information about the direct effect of integration to the competitive position of the manufacturer
When is the investment in the integration of customers well invested in your company?	CA, CI	information about the circumstances that make the investment in integration processes valuable for the manufacturer
What are from your point of view the key factors that give your business a CA?	CA, CI	information about the crucial factors to achieve CA
What would you give particular and special attention to in the integration of the customer?	CI	information about the preferences of the manufacturer (hidden priority)

In addition to the previously presented design map of the guideline, there is also a guideline for the interviews with the experts of the airports that is developed and presented in Subchapter 10.2.2.

10.2.2 Airport

Similar to the procedure on the manufacturers' side, the guideline for interviewing the customers' side was developed using the theoretical discussion of the previous chapters. Due to the fact that the guideline serves to ask the customer about their perspective, it forms a position counter to the manufacturing side. The orientation of the guideline leans heavily towards the manufacturers' side. Tables 29a and 29b represent the guideline for the interview with the airport as a user of BHS.

TABLE 29a: Interview guideline and category pre-definition related to the airport, part 1

Question	Main-category	Research related goal
Please estimate the market from your point of view.	Market	trustful communication, information about industry climate
At what stages of the achievement creation do you see possibilities for the integration of the airport customer or for achievement of a customer contribution?	CI	information about the phase in the value chain where the customer can be integrated or is accepted to deliver achievement contributions
When do you develop joint solutions or achievements with the manufacturer of the system?	CI	achievement of process related information
How would you estimate the participation of the airport in the provision of services?	CI	What results can be expected if the airport disagrees concerning a contribution?
By which factors can the airport support the manufacturer of the system?	CA, CI	identification of supporting factors to the manufacturer
What does the product homogeneity effects in the bidding phase?	CA	information about the effect of product homogeneity

TABLE 29b: Interview guideline and category pre-definition related to the airport, part 2

Question	Main-category	Research related goal
How would you describe participation in the provision of services?	CI	What happens if integration does not happen?
What are the requirements of the manufacturer that are indispensable for you?	CA, CI	information about indispensable factors that must be available on the manufacturers' side
Where exactly do you see possibilities in your process chain for engagement and control by the airport?	CI	Where and what is the customer able to contribute?
What role does the relationship management for manufacturers in the procurement process play?	Relationship	information about the influence of relationship
Which components are crucial for you to build a relationship management with the manufacturer?	Relationship	information about most important factors to craft relationships
Under what circumstances would your company would prevail in the competition?	CA	necessary factors that must be available
Would you be willing to pay a higher price if the airport were integrated?	CA	Is CI an additional value that the customer is willing to pay for?
What would you give particular attention to an integration project?	CI	information about the preferences of the manufacturer (hidden priority)
What benefits do you hope to gain from integration projects?	CA, CI	information about expectations

The guideline covers 15 questions and was designed in a way that they can be answered generally in a period of about 45 minutes. This period is intended as a benchmark and was agreed upon by the experts in the preliminary meeting about the time period for the interview. Due to the focus of the research question the guideline was comparable designed to the manufacturer's perspective. In a repeat of the embodiments of the previous Subchapters 10.2 and 10.2.1 will be obmitted at this point, unless the context of responses permits.

10.3 DESCRIPTION OF THE SAMPLE

In order to collect the data a special form of semi-standardized interview was chosen. This comprises the expert interview (Atteslander, 2003: 157; Mayer, 2002: 37).[443] Meuser and Nagel (1991: 442) state, the special feature here is that the focus is not on the interviewee as a person but as an expert, in all of their organizational or institutional context, resulting in a focus of the interviewed person on his professional expertise (Mayer, 2002: 37). Meuser und Nagel (1991: 442) argue: „Wenn es aber um handlungsleitende Regeln jenseits von Verordnungen, um ungeschriebene Gesetze des ExpertInnenhandelns, um tacit knowing und Relevanzaspekte geht, gibt es zu offenen ExpertInneninterviews keine Alternative“.[444] Mayer (2002: 37-38) argues that the expert interview must meet the criterion of context representation. This is ensured when the interviewee is not a single case, but representative of a group. Gläser and Laudel (2010: 11) define the expert interview as a „Interview mit Angehörigen solcher Eliten, die aufgrund ihrer Position über besondere Informationen verfügen“.[445] There is the superior knowledge of experts possibly only on field of the expert´s research area

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[443] Cf. Subchapters 10.1 and 10.2.

[444] Translation from GER according to Meuser und Nagel (1991: 442): "But when it comes to action-guiding rules beyond regulations to the unwritten laws of experts acting tacitly, knowing the relevance aspects, there is no alternative to open expert interviews".

[445] Translation from GER according to Gläser and Laudel (2010: 11): "Interview with members of such elites, who have, due to their position, specific information available".

(Keuneke, 2005: 262) and relates to exclusive access to appropriate information (Meuser and Nagel, 1991: 443).

Schütz (1972: 87) states that expert views on facts „(…) gründen sich auf sichere Behauptungen; seine Urteile sind keine bloße Raterei oder unverbindliche Annahmen".[446] Gläser and Laudel (2010: 12) define: The expert „(…) beschreibt die spezifische Rolle des Interviewpartners als Quelle von Sozialwissen über die zu erforschenden sozialen Sachverhalte. Experteninterviews sind eine Methode dieses Wissen zu erschließen".[447] Therefore, Meurer and Nagel (1991: 443) argue that the expert status is closely related to the research question and also to exclusive or privileged information. Table 30 presents the relevant criteria in the context of the research question and to the selection of the experts.

To explore the knowledge of the experts, their selection was deliberately and consciously based on the specific criteria for this work. This means that no random samples were drawn. However, there was a conscious choice of critical cases (Kromrey, 2002: 271; Lamnek, 2005: 384), where the criteria are crucial. Due to these criteria a particular view of a person can be stated as typical (Schnell et al., 2005: 299). The selection of experts was carried out in the context of the research question (Kromrey 2002: 259).

It was important that the experts should work for a firm[448] based in Germany, either producing BHS or utilizing the achievements of a BHS. Under this criterion all firms can be subsumed that are both manufacturers of complete systems as well as of relevant sub-systems, or are able to apply them as part of their core achievements within the achievement creation.

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[446] Translation from GER according to Schütz (1972: 87): "(...) be based on reliable assertions; his judgments are not mere guesswork or assumptions".

[447] Translation from GER according to Gläser and Laudel (2010: 12): "(...) describes the specific role of the interviewee as a source of social knowledge about the social issues to be explored. Expert interviews are a method of exploring that knowledge ".

[448] In accordance with the topic of the dissertation manufacturers who are not located and legally registered in Germany are not part of these considerations.

TABLE 30: Criteria for the selection of the experts

Reference point	Selection criteria
Organization	Member of an organization that manufactures or applies BHS or related sub-systems
Country of the organization	Germany
Position within the organization	Decision-making or influencing decision on a relevant basis
Occupational industry experience	More than 5 years
Occupational BHS experience	More than 5 years
Occupational level of experience	Expert
Occupational status	Active
Dissertation related	Supporting the project by answering the questionnaire on a free basis; interested in the results

This criterion also includes the airport as a user of the BHS. As part of the work for Chapter 8 was based on prior considerations, 21 manufacturers and 11 airports[449] were contacted, of which 17 manufacturers (anonymous: M1-17, M = manufacturer) and 8 airports (anonymous: C1-8, C = customer), as well as one participant per organization, and after legal examination of the interview

[449] Only airports with a major status, or a secondary or regional hub that was selected, were relevant to the investigation. These have a high proportion of transfer passengers and complex BHS requirements (cf. Subchapter 8.1, Tab. 19).

guideline, agreed to participate in the survey. Of the manufacturers contacted 4 firms disagreed, while on the customers' side 3 airports agreed to participate in the survey. Reasons for non-participation included legal reasons (5 firms), while 2 others were simply not interested in the survey. Nevertheless the study achieved a coverage of 80.95% of the manufacturers, and for the relevant customer side (airport) 72.73%.

All the participating experts behaved cooperatively, so that the discussions could be carried out in April 2015.[450] All participants requested anonymity and the non-use of citations, which was assured. Furthermore, care was taken in selecting the experts in such a way that they were experienced within the airport industry and specifically in the field of BHS.

The relevance of this criterion reveals itself from the presentations of the system complexity, the networking with other airport specific systems, and in particular with the legal framework, discussed in chapter 8.

Another relevant factor is that it was ensured that the selected experts are active professionals[451] in the baggage handling field and are in positions of being either decision makers or have significantly influence on decisions. The threshold set for the required experience criterion is 5 years or more.

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[450] Carrying out the interview in the form of a telephone conversation was agreed by all the participants due to time and economic reasons.

[451] The activity criteria exclude retired experts due to the fact that retired experts might be a risk concerning the security of state-of-the-art technical developments and conditions in the industry.

TABLE 31: Selection of airport experts

Organization	Code	Organizational unit	Occupational position	Industry experience [years]	BHS experience [years]
Airport	C_1	Technology	Director Airport Expansion & Planning	16	14
Airport	C_2	Technology	Technical Director	28	22
Airport	C_3	Procurement	Procurement Director	15	15
Airport	C_4	Technology	Technical Director	14	12
Airport	C_5	Technology	Head of Baggage Handling Logistics	12	8
Airport	C_6	Technology	Manager Baggage Conveying Logistics	17	16
Airport	C_7	Technology	Managing Director Airport Logistics	24	17
Airport	C_8	Procurement	Purchase Director	26	20

Table 31 presents that the selected airport in which experts have an average industry-specific experience of 19 years. A 15.5 years average includes experience with BHS.

TABLE 32a: Selection of manufacturer experts, part 1

Organization	Code	Organizational unit	Occupational position	Industry experience [years]	BHS experience [years]
Manufacturer	M_1	General Management	Managing Director	18	12
Manufacturer	M_2	General Management	Managing Director	25	21
Manufacturer	M_3	General Management	Managing Director	17	8
Manufacturer	M_4	General Management	Managing Director	23	16
Manufacturer	M_5	Sales	Sales Director	19	8
Manufacturer	M_6	General Management	Managing Director	13	7
Manufacturer	M_7	General Management	Managing Director	15	12
Manufacturer	M_8	General Management	Managing Director	14	14
Manufacturer	M_9	Sales	Head of Sales & Project Management	23	19
Manufacturer	M_{10}	Sales	Head of Sales Airport Projects	17	12

TABLE 32b: Selection of manufacturer experts, part 2

Organization	Code	Organizational unit	Occupational position	Industry experience [years]	BHS experience [years]
Manufacturer	M_{11}	General Management	Managing Director	25	23
Manufacturer	M_{12}	Sales	Head of Sales	24	18
Manufacturer	M_{13}	General Management	Managing Sales Director	26	23
Manufacturer	M_{14}	Sales	Head of Sales & Project Management	16	7
Manufacturer	M_{15}	Sales	Head of Sales Airport Solutions	15	12
Manufacturer	M_{16}	Sales	Head of Sales & Project Management	16	14
Manufacturer	M_{17}	Sales	Sales Director	26	18

Tables 32a and 32b present the experts of the selected manufacturers, who have a sector-specific experience of 19.5 years. A 14.35 year average includes experience with BHS.

Table 33 presents the criterion of the expert level for the manufacturer as well as the customers' side.

TABLE 33: Definition of the expert status level

Average experience	Code		Status level
	M_{1-17}	C_{1-8}	
Industry experience [years]	19.50	19.00	Expert
BHS experience [years]	14.35	15.50	Expert

An additional criterion was the willingness to answer the questions as well as interest in the subject of the investigation. It was agreed with every expert involved to hand over a summary of the results of the investigation. Due to many years of experience in the BHS industry the interviewer (author) has had easier access to the experts. Regarding access, acceptance and communication in the context of the interviews, as well as for the evaluation of the answers, the author's experience of system manufacturers in the airport industry over 13.5 years and in the field of BHS of 8 years as a decision maker has proved very helpful and efficient.

10.4 EVALUATION

The following evaluation is based on the interview and is retained in the respondents' transcript answers. The answers of the experts were as described in Subchapter 10.1, categorized and summarized.[452] The original time agreed with the manufacturers was 60 minutes, but varied in practice, being between 30-90

[452] Cf. Appendix I.

minutes. For the customers the time was planned and agreed to be 45 minutes. The time needed for the interview with the airports was, in practice, between 30-60 minutes. This resulted from the interview transcript material of 176 pages (A4).[453] Talks with the experts for preparing the interview, making the appointment, or the presentation of the topic of the dissertation, were not detected in this case.

The evaluation is distinguished in the following chapters of the expert group I and II and will be evaluated in both groups separately. The main points are highlighted. However, the main categories of the evaluation between the two groups are the same and are divided into the following categories: Market, CA, CI, and Relationship. Differences arise due to the different combinations of questions and answers based on the sub-categories. Both groups were compared to each other regarding their differences and similarities. Important is that all experts freely tell their arguments according to the questions by the interviewer. Additionally, for the evaluation of the answers and its interpretation it is important to consider that answers with a low or very low frequency (i.e. frequency of 1; 11% or similar) will be shown and discussed as well if these arguments are of relevance for the argumentation to answer the research question comprehensively.

10.4.1 Expert group I: Manufacturer

10.4.1.1 Market

As an ice breaker a question was asked concerning the assessment of the market. The focus of the question was based on the individual perspective of the experts about obtaining information on market conditions in the BHS-sector. It was asked in order to build a trustful and motivated communication between the interview partners. This goal was achieved in all cases and formed the basis for the further course of the interview. The evaluation of each category presents the following picture, also summarized in Table 33.

[453] Appendix III contains the information that the transcripts are originally in German language and are handed-over to the UCAM as a PDF-file.

- Project availability: In their assessment of the prevailing market conditions 88.24% (15) of the manufacturers surveyed operate in a market in which only a few projects are available and strong competition for public contracts exists. According to the statements 82.35% (14) of the experts this determines the industry climate. This is according to 11 (64.71%) of the manufacturers surveyed, and is due to the fact that competitors from economically weak EU-countries try to establish themselves as new entries at German airports against the already established German manufacturers. Due to the complexity of the BHS industry 23.53% (4) of the manufacturers surveyed assume a low market growth, where only 2 (11.76%) of the manufacturers identify competitors from EU low-cost countries as real competitors.
- Behavior: Because of the fewer available opportunities and strong competition for public contracts 41.18% (7) of the experts describe competitive behavior as aggressive, and supported by limited investment budgets on the customers' side (2; 11.76%). This, according to the estimation of the respondents, leads to a declining price level (4; 23:53%) in the market.
- Preferences: Regarding prevailing preferences the experts were cautious and careful. Only 1 (5.88%) of the manufacturers surveyed estimated that preferences are set by customers in favor of national or local suppliers, together with high standards in terms of flexibility, price and performance. One (5.88%) manufacturer indicated that as a result of these conditions they should focus their business on national or local projects whose basis is customer proximity, references and relationships.
- New entries: Here is specifically from 2 (11.76%) respondents addressed, the market launch of firms from outside the BHS-sector that have established themselves with similar logistic applications in other industries. The aggressiveness of new entries on the EU-market was highlighted by 11 (64.76%) respondents, which means that the new entries represent a disproportionately high share of the aggressive market behavior in relation to the general market

behavior. Through new effects on the industry price levels were triggered and are cited as representative by 3 (17.65%) respondents.

TABLE 34: Market evaluation by the manufacturers

Sub-category	Evaluation	Frequ.	Share [%]
Project availability	Low number of available projects	15	88.24
	Strong competition for public projects	14	82.35
	EU-competitors face weak home economy markets	11	64.71
	Small growth on customer side	4	23.53
	Competition: EU-low cost	2	11.76
Behavior	Aggressive competitive behavior	7	41.18
	Decreasing price level	4	23.53
	Strong budgeted investment volume on customer side	2	11.76
Preferences	Preference for national / local suppliers	1	5.88
	Max. achievement at low price and high flexibility	1	5.88
	Manufacturer: Focus on national projects	1	5.88
New entries	EU-competitors aggressive	11	64.71
	Impact on industry price levels	3	17.65
	Market entry of industry strangers increases	2	11.76

To gain a comprehensive picture of the market situation the producers were asked to tell and freely assess which factors they currently differentiate from the competition under the prevailing market conditions. The assessment of the manufacturer is shown in Table 35.

Particularly striking here is the assessment of the experts on emphasizing that there is substantial differentiation possible by relationship-based variables. Thus the respondents mentioned the management of relations with customers and system partners (17; 100%) as well as the qualifications and quality of the sales staff (16; 94.12%) as differentiation factors.

The long-term relationship with the customer as well as cooperation with leading airports and system manufacturers as LU[454] suggests that 88.24% (15) of the respondents currently differentiate themselves from the competition. An almost equally important 82.35% (14) of the experts maintain a good relationship with customers, as well as having an early involvement with customers and manufacturers.

TABLE 35: Differentiation factors under current market conditions

Sub-category	Factors that currently differentiate from competition	Frequ.	Share [%]
Differentiation factors	Relationship management to customers and system partners	17	100.00
	Qualification / quality of sales employees	16	94.12
	Long-term collaboration with the customer	15	88.24
	Collaboration with leading airports / system manufacturers	15	88.24
	Good / close contact to customers	14	82.35
	Robust customer relationship	14	82.35
	Early involvement of / by customer / manufacturer	14	82.35
	Knowledge of customer requirements / industry trends	13	76.47
	Product state-of-the-art (easier entry)	9	52.94
	Releationship network / synergetic partnerships	8	47.06
	Use of regional location advantages	3	17.65
	References	3	17.65
	Focus on projects below thresholds / partial lots	2	11.76
	Added customer value	1	5.88
	Product advantages in accompanying offer	1	5.88
	Fairness and integrity	1	5.88
	Neutral consulting / collaboration	1	5.88

[454] Cf. Subchapter 7.4.

It is surprising that in an industry in which highly complex customized logistic systems are created only about three-quarters (13; 76.47%) of the respondents cited knowledge of customer requirements and industry trends as a means to differentiate in the competition.

This may be due to the fact that the specific requirements of a customer differ from project to project and may be new for the manufacturer. However, this does not exclude the need that specific requirements, trends and basic problems of the technical industry such as specific solutions must be known to the manufacturer in order to meet the specific needs of the airport. Only about half the respondents (9; 52.94%) said that the product is suitable as an entry ticket to differentiate it from competitors, while less than half (8; 47.06%) of the experts are currently engaged in relationship networks and synergetic links with partners as a differentiating factor.

The use of regional location advantages (3; 17.65%), references (3; 17.65%) and the focus on projects below the thresholds (or on partial lots) (2; 11.76%) was assessed by the experts interviewed as currently less used methods that support differentiation. The percentage of references added value for the customer, cooperation by a neutral consulting approach, the identification of product advantages or the possibility of placing an accompanying offer is rather small, as is the basic willingness to fairness and seriousness. These points were mentioned only by one respondent each as a differentiating example and therefore take a share of 5.88% (1) in the evaluation of current differentiation factors.

10.4.1.2 Competitive advantage

In order to achieve CAs it is essential to identify which factors and perspectives are of particular relevance. To learn about this the following chapter deals specifically with the relevance of differentiation factors, success barriers, supporting factors, and access to these factors. Furthermore, the chapter provides an analysis of the preferred procedure when a manufacturer achieves access to supporting factors, as well as the success factors that appear likely to strengthen competitiveness.

This is followed by an evaluation of the impact that integration of the customer would have on the achievements of a manufacturer, as well as on achieving competitive success.

Subsequently, an evaluation is conducted that deals with the attractiveness of an investment for the integration of customers. The chapter concludes with an evaluation of determining factors for achieving CA. It should be noted at this point that some substantive contact with the topic of CI, the evaluation of which is in Subchapter 10.4.1.4, is deliberately intended because this presents the relationships between CA as well as CI.

TABLE 36: Relevant differentiation factors in order to achieve competitive advantage

Sub-category	Relevant differentiation factors to achieve competitive advantage	Frequ.	Share [%]
Factor relevance	Prominence / technical expertise, reference, reputation	17	100,00
	Access to involved parties / networking	17	100,00
	Customer consulting in advance of the project tender	17	100,00
	Functioning sales / customer service	16	94,12
	Relationship to customer is crucial	16	94,12
	Understanding of specific requirements in advance of the tender	14	82,35
	Activities of relational (relationship oriented) character	13	76.47
	Strong relationship management	10	58.82
	Early project entry	9	52,94
	Consulting approach	5	29,41
	Solution finding in advance of the tender	3	17,65
	Early information (information advantage)	3	17,65
	Proximity, local relation	2	11,76
	Support with system planning	1	5,88
	Solution orientation	1	5,88

The experts interviewed (17), all of whom have a reputation for technical expertise, suggested access to the involved parties and to consult the customer in advance of the tendering of the project as particularly relevant differentiation factors for CA (see Table 36). The advisory approach is only seen as relevant by five (29.41%) of manufacturers. This is without exception to the manufacturers, who have had above-average business developments over the past three years. Of

particular importance is a functioning customer service maintained through the sales department (16; 94.12%), in which the relationship with the client is crucial (16; 94.12%), and which also correlates to the information on current differentiation factors.

With a share of 82.35% the respondents mentioned the development of understanding the specific requirements in advance of an invitation to tender. This point differs here only by 1 (5.88%), a designation of the assessment of the current differentiation factors. About half (9; 52.94%) of the experts see an early entry into a project as crucial for achieving CAs, of which only 17.65% (3) connected this with the obtaining of information advantages through early communication with the customer. Relational based activities (13; 76.47%) are also seen as very important, although a strong relationship management is attributed only to 58.82% (10). The close proximity to the customer, and thus the local advantages, were mentioned by 2 (11.76%) manufacturers, while the support of the airport in planning the system and the exclusive orientation of the development of the solution to the problem were only mentioned by 1 (5.88%).

Table 37 presents the difficulties that manufacturers of BHS identified in achieving CAs. All manufacturers (17; 100%) mentioned product homogeneity, cost-dominant evaluation methods in the evaluation of tenders and difficulties in the timely development of appropriate project partnerships as key success barriers. Early communication with the customer and the resulting information advantages may help to solve that problem, but were in Table 36 only mentioned by 17.65% (3), referring to them as relevant differentiation factors. It is mentioned by 41.18% (7) of the manufacturers as a barrier to success. Therefore it is logical that the expenditure in the preliminary phase of a project by 16 (94.12%) of the manufacturers is considered to be high, and the need to reduce costs, especially the costs of quotation, were mentioned as high by 76.47% (13) of the manufacturers. Deviations from the tender documents (tender specification) can but need not be admitted. This is what 16 (94.12%) of the manufacturers mentioned as a success barrier.

With the non-admission of alternative tenders comes a lack of differentiation through associated technical benefits. 12 (70.59%) of the manufacturers were identified as a hindrance to the achievement of CAs. Additionally, 12 (70.59%) of manufacturers considered the difficulties of building

a relationship with the customer within a defined time, beginning from the publication of the project to the delivery of the tender, although only 7 (41.18%) of the experts mentioned access to the relevant contact persons as success barrier.

TABLE 37: Success barriers to achieving competitive advantage

Sub-category	Barriers to achieving competitive advantage	Frequ.	Share [%]
Success barriers	Product homogeneity (via specification)	17	100.00
	Offer comparison / evaluation cost driven	17	100.00
	Early development of suitable partnerships	17	100.00
	High expenditures in preliminary phase (goal cost reduction)	16	94.12
	Deviation from specification only possible by previous announcement	16	94.12
	High costs of tender preparation	13	76.47
	Technical advantages cannot be presented	12	70.59
	Time to prepare tender for short for building relationship management	12	70.59
	Access to decision makers and planners	7	41.18
	Selection of suitable partnerships (manufacturer / supplier)	7	41.18
	Obtaining early information	7	41.18
	Building relationship with customer	6	35.29
	Early start of activities in advance of the announcement / invitation to tender	6	35.29
	Investment with uncertain refund	4	23.53
	System concept based on foreign planning	2	11.76
	European invitation to tender: language barriers	1	5.88
	Observation of access to customer by competitors	1	5.88

The selection of appropriate partnerships is on the same level with manufacturers and suppliers. This point is not the same as with the above-mentioned development of appropriate partnerships, since the selection can be a unilateral process, while the development of suitable partnerships is a process in which several parties (at least two) are involved with a corresponding declaration of intent.

In addition to the relationship building of the airport, 6 (35.29%) of the manufacturers mentioned that the difficulty is in beginning the activities of the manufacturer in advance of the announcement of the project (invitation to tender). Additionally, the uncertainty related to the refund of an investment in the project participation was mentioned by 4 (23:53%) manufacturers. There were also difficulties such as the quotation being made to a foreign-based plant design (2; 11.76%), language barriers in cases of European projects in non-German-speaking countries (1; 5.88%) and the fear that contacts to customers were observed by competitors who will gain access to the customers (1; 5.88%).

As it was seen as helpful in achieving a CA (cf. Table 38) 16 (94.12%) of the manufacturers described the support provided by the airport itself, the planners, and also sub-system and component suppliers. Support from employees of the customer was considered by 15 (88.24%) of the experts as particularly valuable, where the customer was mentioned as the best possible source for support by 2 (11.76%) of the experts. Almost half of the respondents (8; 47.06%) mentioned that all factors for achieving CAs are welcome, in particular cooperation with competitors, such as in contractual relationships. At the same time, support from politics and associations were mentioned by only 2 (11.76%) of the experts, and by their own employees only 1 (5.88%) mentioned the manufacturer as a supportive factor.

TABLE 38: Support for achieving competitive advantage

Sub-category	Supporting factors for achieving competitive advantage	Frequ.	Share [%]
Support	Planner, customer, supplier of sub-systems / components	16	94.12
	Employees of the customer	15	88.24
	All sources (also competitors) welcome	8	47.06
	Politics, associations	2	11.76
	Customer as best source	2	11.76
	Manufacturer own employees	1	5.88

In order to gain access to these support groups (see Table 39), the manufacturers invest mainly in building an active and purposeful relationship management (16; 94.12%) and especially use their existing contacts with LU´s, which are used as references (16; 94.12%). Networking and the exchange of information (14; 82.35%) facilitates early and targeted building-up of sales activities (13; 76.47%). Constant customer contact and building a long-term and sustainable relationship with the customer were mentioned as access factors by 6 (35.29%) of the manufacturers. This suggests that manufacturers do not focus on a long-term but rather on a coordinated relationship with the customer for the duration of the project, since the number of available projects for a single customer is classified as low[455] and thus means an uncertain pre-investment in future project participation[456]. Employees who identify with the project mention only 2 (11.76%) of manufacturers as a key to gain support.

TABLE 39: Factors to gain access to support

Sub-category	Factors to gain access to support	Frequ.	Share [%]
Access factor	Active and targeted relationship management	16	94.12
	Existing contacts (references, LU)	16	94.12
	Networking (information exchange)	14	82.35
	Early targeted building-up of sales activities	13	76.47
	Permanent contact to customers (sustainable relationship building)	6	35.29
	Employees (identification with project)	2	11.76

Table 40 shows that the elaboration of a problem solving solution jointly developed with the customer, which makes use of the manufacturer´s product basis, was identified by 94.12% (16) of the manufacturers as the next step after

[455] Cf. Subchapter 10.4.1.1 (Tab. 34, low number of available projects, value: 15; 88.24%).

[456] Cf. in this Subchapter (Tab. 37, investment with uncertain refund, value: 4; 23.53%).

receiving access to support options. For 15 (88.24%) of the manufacturers it is crucial to support customers as early as possible in the process, and in advance of the publication of the project concept or invitation to tender in order to take full advantage of the relationship management, especially that of building trust. This would help with joint problem solving in order to integrate the solution into the system specification, and so set preferences.

TABLE 40: Factors to continue after access

Sub-category	Factors determining the proceeding after gaining access	Frequ.	Share [%]
Proceeding after access	Common development (solution based on products)	16	94.12
	Cooperative collaboration with all parties involved	16	94.12
	Early use of possibilities for relationship management (trust)	15	88.24
	Support to customers as early as possible (in advance of public announcement / invitation to tender)	15	88.24
	Common solution in specification (preference)	15	88.24
	Investigating / understanding the problems of the customer	13	76.47
	Strong customer involvement to defend common solution	13	76.47
	Communication under application of experience and industry knowledge	7	41.18
	Usage of information advantage	5	29.41
	Implementation of customer solution proposals in system concept	3	17.65
	Systematic assessment of entry barriers to competition	1	5.88

For 13 (76.47%) of manufacturers it is the knowledge of the problem of the customer and the emergence of a strong customer involvement with the goal of defending a common problem-solving solution that is a crucial factor in the procedure. Less than half of the respondents (7; 41.18%) use communication on the basis of experience and industry knowledge, or the use of information advantages (5; 29.41%) as a tool to achieve a CA. This correlates with Tables 38 and 39, where the manufacturer mentioned employees as supporting access factors as a relatively small percentage. The customer´s proposal to solve a problem for implementation into the system concept can be a means to increase

the involvement of the customer. This is also mentioned as critical in the context of a lack of technical know-how on the customers' side in the procedure, and therefore had to be reported separately. Only 3 (17.65%) of manufacturers use this means in the context of the further procedure to achieve a CA. Additionally, a systematic assessment of the entry barriers to the competition was made only by 1 (5.88%) of the manufacturers surveyed.

Furthermore, the manufacturers surveyed also mentioned the circumstances under which they would be successful against competitors. The results of the survey are presented in Table 41. Accordingly 16 (94.12%) of the manufacturers state that they can then be successful against the competition if the proposed solution for the customer is optimal, the accepted price level is adequate and the customer prefers the jointly developed solution. Here the employees of the customer are acting internally as employees of the manufacturer and are supported by their involvement in the joint problem-solving (3; 17.65%).

Fourteen (82.35%) of the manufacturers surveyed mention as an enforcement factor the integration of the customer and a relationship with the customer that allows other evaluation criteria to become secondary. More than half (10; 58.82%) of the manufacturers mention preferences that arise based on relational factors and that lead to high exit barriers for customers as appropriate enforcement factors.

Less than a third of the manufacturers (5; 29.41%) mentioned a customized combination of tangible and intangible factors, but without being able to specify this due to their customer specificity, as well as creating high entry barriers for the competition as a success-promising enforcement factor. As additional enforcement factors, the manufacturers mentioned poor access for competitors to the customers (2; 11.76%), as well as the introduction of subjective factors in the assessment and rating. Thus the decoupling of rational evaluation methods (2; 11.76%) and achievements in advance of the project (1; 5.88%), such as renovation or re-structuring projects, are yet additional factors.

TABLE 41: Success factors to enforce against competitors

Sub-category	Enforcement factors that determine success in competition	Frequ.	Share [%]
Success	If the solution for the customer is optimal	16	94.12
	a price that the customer accepts	16	94.12
	If the customer defends the commonly developed solution (preference)	16	94.12
	If the relationship to the customer is so good that other evaluation criteria are secondary	14	82.35
	If the customer agrees to its integration / involvement	14	82.35
	Preferences based on relational factors / high involvement / high exit barriers	10	58.82
	Customized factor combination (tangible, intangible)	5	29.41
	High entry barriers to the competition	5	29.41
	Customer as quasi-sales-employee of the manufacturer	3	17.65
	Competitors with poor access to customers	2	11.76
	Introduction of subjective factors in the assessment	2	11.76
	Extension of an existing facility made by ourselves	1	5.88

Table 42 illustrates how the integration of the customer in the opinion of the manufacturer can affect the performance of the firm and thus the achievement of CAs. Accordingly, 94.12% (16) of the manufacturers state that they could gain better knowledge of the customer's requirements and can more effectively assess the project risks. Based on this,14 (82.35%) of the manufacturers mention the possibility of offering lower prices by improving the price structure, in which a simplified claim management can also be integrated in the calculation, due to the reduction of the claim costs (3; 17.65 %). This can be done more efficiently by improving access to the customer's contact persons.

Seven (41.18%) manufacturers also identify the dangers of unrealistic pricing[457], which has as its basis a false sense of security through integrating the customer, and could lead to a competitive disadvantage.

[457] What is meant here is pricing that is above the market price level.

TABLE 42: Achievement effects by customer integration

Sub-category	Effects on the achievements of the manufacturer	Frequ.	Share [%]
Achievement effects	Better knowledge about requirements / achievement specification	16	94.12
	Better risk assessment	16	94.12
	Lower price (based on risk assessment)	14	82.35
	Reduced claim management (fewer numbers of points to discuss with the customer)	14	82.35
	Easier project management by improved access to involved participants	14	82.35
	Exact calculation possible	13	76.47
	Targeted product placement in the market possible	8	47.06
	Unrealistic pricing through false sense of security	7	41.18
	Project success increased by shared goals	5	29.41
	Reduced number of claims (cost reduction)	3	17.65
	Information advantage	3	17.65
	Increase of efficiency (cost reduction)	2	11.76
	Effects on all project phases	1	5.88
	Definition of achievement contributions of the integration partner	1	5.88

The positive effects of the success of the project were anticipated by the manufacturers through shared goals (5; 29.41%), temporal information advantage (3; 17.65%), a reduction in the cost of sales through improved efficiency (2; 11.76%), and a clear definition of achievements contributed by the integration partner (1; 5.88%) that avoids or at least reduces operational friction through inefficiency and the impact of integration on all project phases (1; 5.88%).

In addition to this Table 43 presents the integration of the customer affecting the achievement of a CA for the manufacturers.

TABLE 43: Customer integration effects on competitive advantage

Sub-category	Effects of customer integration on competitve advantage	Frequ.	Share [%]
Effects on competitive advantage	Close relationship management (trust)	16	94.12
	Achievement of CA by information advantage	16	94.12
	Anticipation of industry development trends / impact	16	94.12
	Building trust base by bilateral risk reduction	15	88.23
	Combination of relationships, information advantage, trust as basis to gain faster and more reliable market information	14	82.35
	Information advantage and reaction advantage crucial / first mover	12	70.59
	Close customer relationship, collaboration, building trust leading to common success	7	41.18
	Trust as a basis for follow-up projects	4	23.53
	Cast of consulting gap (setting of preferences)	2	11.76
	Sales costs / expenses for customer care decreasing	1	5.88
	Ability to fill key technologies	1	5.88
	Due to low risk achievement, higher prices are possible	1	5.88
	Chance to achieve CA increases with increasing degree of integration	1	5.88

Thus, 16 (94.12%) of manufacturers said that a relationship based on trust could be built with the customer as a bilateral risk reduction (15; 88.23%). This would result in an information advantage for the manufacturer, providing CAs. Based on an information advantage a reaction advantage can occur (12; 70.59%) for the manufacturers expressing itself again CAs (e.g. as a first mover advantage). The respondents state the possibility of anticipating and influencing industry trends in the same way.

The combination of relationship, trust and information of a high quality is for 82.35% (14) of the manufacturers the basis for CAs by means of the customer´s integration. Seven (41.18%) of the manufacturers stress that a customer relationship supports cooperation and trust-building and thus has an impact on mutual success. Trust is mentioned by 23:53% (4) of the manufacturers as an advantage for achieving follow-up projects. 11.76% (2) of the manufacturers consider the filling of a consultancy gap that exists when neither the customer nor

the manufacturer has found an optimal solution to a problem to be a possibility for filling key technologies. These achieve a higher price due to bilateral risk reduction and increased opportunities for achieving CAs; the stronger the degree of integration the better.

All the manufacturers (17; 100%) (cf. Table 44) estimate highly the investment in the integration of the customer. This may lead to an order or even to the creation of unique customer access. Customer satisfaction, and the access to follow-up projects, as well as requests by the customer for consulting services in advance of new projects, is the substantiation of a worthwhile investment in CI for 15 (88.24%), and a recommendation by the customer for (14; 82.35%) of the manufacturers.

TABLE 44: Investment attractiveness for the integration of customers

Sub-category	The investment in customer integration is attractive, if …	Frequ.	Share [%]
Investment attractiveness	…we get the order.	17	100.00
	…we get unique access to the customer / involved parties.	17	100.00
	…the customer is satisfied with us.	15	88.24
	…we get access to follow-up projects.	15	88.24
	…the customer wants our expertise in advance of new projects.	15	88.24
	…the customer / project partner recommends us.	14	82.35
	…the customer contacts us self-motivated for follow-up projects.	10	58.82
	…we have a CA due to higher information quality and an advantage in time.	10	58.82
	…the project risk is lower and better to calculate.	10	58.82
	…a customer relationship (achievement partner) occurs, which is a disadvantage for externals.	5	29.41
	…we achieve a leading market position and can defend it.	3	17.65
	…we achieve long-term customer loyalty.	1	5.88

More than half of the manufacturers (10; 58.82%) see the investment as worthwhile when the customer is in own initiative motivated to contact the manufacturer and there is a CA due to a higher information quality or tempory information advantage results. Project risk is also calculated better, or can even be

reduced. Additional points include the development or defense of a leading position in the market (3; 17.65%), and in the long-term customer loyalty to the manufacturer (1; 5.88%).

Finally, Table 45 presents the factors mentioned by the manufacturers as essential for determining the achievement of CAs. Factors for instance based on relationships between actors in a unique combination that competitors cannot readily provide, consisting of relationally based variables of the manufacturer and the customer 16 (94.12%). Manufacturers are also insistent on achieving CAs. A similarly high percentage (15; 88.24%) occupies the early securing of project partnerships, which enables manufacturers to combine resource combinations from different manufacturers towards a customized and optimal achievement.

TABLE 45: Determining factors for achieving competitive advantage

Sub-category	Determining factors for achieving a competitive advantage	Frequ.	Share [%]
Determining factors	Factors that rely on relationships between people	16	94.12
	Unique combination of factors that competitors cannot provide in the short-term	16	94.12
	Unique combination of manufacturer and customer related factors based on relationship variables	16	94.12
	Early endorsement of appropriate partnerships	15	88.24
	Combination of factors containing the lowest risk for the participating firms	10	58.82
	Relationship management (relational factors) to reduce project risks	10	58.82
	Intangible factors distinct from the competition	7	41.18
	Trust, communication, commitment, understanding	7	41.18
	Early information	5	29.41
	Preference setting	3	17.65

Slightly more than half (10; 58.82%) of the manufacturers rely on factor combinations. These include the lowest risk factors for the firms involved. Intangible factors such as trust, communication, commitment loyalty, understanding, etc. have been mentioned by 7 (41.18%) of manufacturers in this

context as determining factors, complemented by early information gathering (5; 29.41%) and the setting of preferences (3; 17.65%).

10.4.1.3 Customer integration

The starting point for the integration of a customer is first to motivate the customer to collaborate with a manufacturer in the process of achievement creation. The following Tables 46, 47 and 48 summarize the responses of the manufacturers surveyed as to how they motivate customers to cooperate in the pre-phase, during the implementation and after completing the system.

As collaboration and supporting factors related to the preliminary phase of the project (Table 46), 16 (94.12%) of manufacturers mention building a relationship of trust through the targeted application of relationship variables.

TABLE 46: Motivation to collaborate in the pre-phase of a BHS project

Sub-category	Motivation to collaborate	Frequ.	Share [%]
Collaboration (pre-phase)	Trust: problem solving skills, innovation, information, communication, commitments	16	94.12
	Targeted strong application of relationship variables	16	94.12
	Intensifying of sales (technical sales) activities and interpersonal compatibility	16	94.12
	Usage/ integration of customer experience / knowledge to develop a solution.	16	94.12
	Targeted use of references	15	88.24
	Presentation of know-how, information, knowledge, etc.	15	88.24
	Problem affinity	15	88.24

Also relevant is the intensification of the sales activity by the creation of interpersonal compatibility through combining appropriate customer contact partners as well as the transfer of knowledge and customer experience in order to develop a problem-solving solution.

In addition, 15 (88.24%) manufacturers mention the targeted use of references, the presentation of expertise, the exchange of information and the

presentation of problem affinity as a motivation for collaboration between customer and manufacturer.

In the implementation phase of the project (Table 47), 16 (94.12%) of manufacturers motivate their customers by maintaining and fulfilling commitments and through proactive communication and information. A professional approach in project implementation (14; 82.35%) and maintaining a strong relationship management (13; 76.47%) are also some of the favorite motivators of the manufacturers. Flexibility in the implementation of the project motivates less than half of the manufacturers (7; 41.18%), while 23.53% (4) identified the installation of escalation structures to deal with conflict situations as appropriate. An enhanced customer involvement in the implementation phase, stronger active participation by the customer and the development of application and customer-specific solutions for securing of the project operations are mentioned by 17.65% (3) of the manufacturers as collaboration motivation factors.

TABLE 47: Motivation to collaborate during installation of a BHS

Sub-category	Motivation to collaborate	Frequ.	Share [%]
Collaboration (implementaton)	Keeping / fulfillment of commitment	16	94.12
	Proactive communication / information	16	94.12
	Professional approach in project implementation	14	82.35
	Strong relationship management, trust	13	76.47
	Implementation flexibility	7	41.18
	Installation of escalation level	4	23.53
	Increase of customer`s involvement (participation) during implementation	3	17.65
	Development of application and customer-specific solutions to secure the execution of the project	3	17.65

For the final project phase (Table 48) 64.71% (11) of the manufacturers mention customer training, followed by the development of customized concepts with the customer (8; 47.06%). The development of customized concepts together with the customer refers to the fact that the manufacturer wishes to find a way to care for the customer after the finalization of the core achievements. This means finding a convenient way to move out of the project when the contractual situation is concluded, thereby making a positive impression on the customer.

TABLE 48: Motivation to collaborate after the finished installation

Sub-category	Motivation to collaborate	Frequ.	Share [%]
Collaboration (finished implementation)			
	Customer training	11	64.71
	Common development of customized concepts with the customer	8	47.06

Manufacturers mention the indispensability of collaboration within the context of CI (Table 49). Accordingly, 16 (94.12%) of manufacturers are convinced that access to the right people is essential for a collaboration between customer and manufacturer; 15 (88.24%) are of the opinion that understanding the requirements and needs of the customer and the existence of the right capabilities (skills, expertise, experience, knowledge, etc.) is indispensable.

Additional statistical factors include the exchange of information between value chain partners (13; 76.47%), the development of a value-added partnership (5; 29.41%) between the customer and manufacturer, between system suppliers[458], and the use of relational based factors (10; 58.82%). These are all identified as indispensable factors. Openness and willingness to collaborate, targeted

[458] Cf. Subchapter 7.3.2 (Fig. 11).

communication and information, as well as the development of an understanding of preferences, are considered by 4 (23:53%) of the manufacturers as indispensable. Surprisingly only 1 (5.88%) manufacturer mentioned the support of the management as indispensable.[459]

TABLE 49: Indispensable factors to motivate customers to collaborate

Sub-category	Indispensable factors for motivating customers to collaborate	Frequ.	Share [%]
Indispensable	Access to success relevant contact partners	16	94.12
	Understanding the needs and requirements of the customer	15	88.24
	Presence of the right capabilities, l such as skills, know-how, knowledge, experiences of the participants	15	88.24
	Information exchange between value chain partners	13	76.47
	Application of relational factors	10	58.82
	Value-added partnership between customer and manufacturer	5	29.41
	Customer open for collaboration	4	23.53
	Open, targeted communication / information	4	23.53
	Understanding preferences	4	23.53
	Support by the management	1	5.88

At this point the manufacturers of BHS are characterized in their process chain achievement contributions by the customer as helpful, as presented in Table 50. Every manufacturer surveyed (17; 100%) identified achievement contributions in the selection, arrangement and combination of value chain partners by the customer. This means that the customers would set preferences by forming ideal combinations of manufacturers, which might be not in accordance with the principles of public procurement stated in §97 GWB.[460]

[459] Cf. Subchapter 10.5.

[460] Cf. Subchapter 8.6.3, Subchapter 8.6.4 and §97 (2) GWB related to the principle of equality or non-discrimination.

TABLE 50: Integrative achievement contribution by the customer

Sub-category	Integrative achievement contribution by the customer	Frequ.	Share [%]
Contribution / Point of integration	Selection, arrangement, combination of value chain partners (cooperation)	17	100.00
	Pre-selection of approved candidates invited to tender (competitors)	16	94.12
	Development of the system specification	16	94.12
	Project planning	16	94.12
	Development of a customer-specific problem solving solution	12	70.59
	Development of the basic system concept	10	58.82
	Focus on the pre-phase of the project	6	35.29
	Implementation of the project / project management (related to capabilities)	4	23.53
	The more complex the solution/implementation, the more difficult the integration of customer contributions	2	11.76
	No application of manufacturer internal systems by the customer	1	5.88

Sixteen (94.12%) of manufacturers identified a concrete achievement contribution of the customer in the pre-selection of candidates (in competition to approved manufacturers) invited to tender. Furthermore, 94.12% (16) of the manufacturers mention a significant performance contribution from the customer in the context of the development of a system specification, as well as in the project planning. Achievement contributions in the development of customer-specific problem solving (12; 70.59%) and the development of the basic concept of the material handling system (10; 58.82%) are also identified as beneficial.

Approximately one-third (6; 35.29%) of the manufacturers specifically mention the pre-phase of the project and thus the period prior to publication of the notice of suitability of the provision of achievement contribution by the customer. This statement corresponds with the above statements by the manufacturers and is a crucial common similarity that will be in detail discussed in the further proceeding in the Subchapters 10.5, 10.6, 10.7.1, 11.1, and 11.2. An achievement contribution during the implementation phase of a project (e.g. in project management) or during installation of a system is mentioned by 4 (23:53%) manufacturers under the precondition that appropriate customer

capabilities exist. In this context 2 (11.76%) of manufacturers state that with increasing complexity of the system the integration of achievement contributions by the customer will be more difficult. Access to manufacturer-internal systems (e.g. IT-based manufacturing documents, etc.) is explicitly excluded by 1 (5.88%) manufacturer.

10.4.1.4 Relationship

The previous analysis of the above mentioned aspects of the manufacturers focuses on the achievement of CAs based on the formation of a relationship between the collaborating firms. Hence, building relationships is based upon determining factors mentioned by the manufacturers surveyed in Table 51. All manufacturers mentioned (17; 100%) an open, consultative and solution-oriented communication with the participants in order to build and support a basis of trust with the customer, as well as a combination of relational factors crucial for building a relationship based on the advantageous position of the manufacturer. The observance of commitments such as loyalty and the joint development of ideas and approaches to solve the customer´s problem occupy a crucial role for 16 (94.12%) of the manufacturers.

One focus of the determining factors for building relationships is that for 15 (88.24%) of the manufacturers the capabilities (skills) of the manufacturers' sales and customer service staff, who ought to be able to integrate actionable solutions for the customer that result a common developed problem solution and increases on this way the customer´s involvement. Additionally, 13 (76.47%) of the manufacturers mentioned the issuing of references (e.g. airports with similar tasks) and an associated verification by the customer if the reference is confirmed positive, reflecting on the reputation of the manufacturer.

In addition, 7 (41.18%) of manufacturers evaluate and integrate experiences and skills (e.g. planning skills, etc.). This is an essential determining factor in the relationship management with the customer. In this way the manufacturer supports the involvement of the customer and gives him his expertise and experience gained in baggage logistics as an integrated part of the achievement creation. Only 1 (5.88%) of the manufacturers use relationship building and

management as a combination of advisory-manipulative elements connected to common development approaches.[461]

TABLE 51: Determining factors for relationship building

Sub-category	Determining factors for relationship building	Frequ.	Share [%]
Relationship building	Supporting and building of a basis of trust by a combination of relationship factors	17	100.00
	Communication in an open, consulting, solution oriented manner	17	100.00
	Fulfillment of commitments / commitment loyalty	16	94.12
	Development of common ideas to find solutions	16	94.12
	Staff of sales and customer care with appropriate skills	15	88.24
	Integration of customer´s solution approaches (customer involvement)	15	88.24
	Positive feedback by third parties / customer related to issued references / reputation basis	13	76.47
	Open discussion of solutions and application of experience knowledge	12	52.94
	Acknowledgement and integration of experiences / skills of the customer	7	41.18
	Mixture of manipulative consulting methods and common development	1	5.88

A manufacturer invests in building a customer relationship with the goal of achieving a CA over the integration of the customer and related joint achievements, otherwise the manufacturer might be exposed to opportunistic behavior from the customer. Concerning the safeguards against opportunistic customer behavior (Table 52) for obtaining the investments, 16 (94.12%) of manufacturers mentioned the increase of the exit barriers for the customer and increasing the entry for the competition as a protective measure against opportunistic customer behavior. This includes 14 (82.35%) of manufacturers increasing their customer involvement for the development of joint solutions of the customer's problem, as well as their inclusion in the system specification (12;

[461] The manufacturer was not willing to explain this approach in detail.

70.59%) and customer loyalty (11; 64.71%) about a strong preference oriented relationship management (10; 58.82%).

Less than half (8; 47.06%) of the manufacturers use cost scenarios as protection against the opportunistic behavior of customers and thereby argue that opportunity costs can occur if the customer terminates the relationship with the manufacturer. Compulsory-opportunistic behavior of the customer would barely be possible with such protection. Two (11.76%) of manufacturers mention this as a reason to protect themselves from the non-disclosure of details, or expertise concerning critical and crucial conceptual points. As background it can be argued that the customer must be interested in the qualifications of several manufacturers in order to gain a quasi-optimal technical solution for the procurement procedure, and thus the customer would be necessarily interested in the disclosure of promising solution approaches and is likely to behave opportunistically.[462]

Therefore, denying the insight of the customers in the value chain of the manufacturer, as well as a defined demarcation of achievement components, interfaces and competencies represents for each 1 (5.88%) of the manufacturers a good protection against customers' opportunistic behavior. Subject to these considerations, the investment in the relationship management might be considered as an uncertain investment because it expires prior to the procurement or the award process and will not necessarily lead to a successful project participation of the investing manufacturer, or to a successful order. How the manufacturers surveyed protect their investment in the preliminary phase of the procurement process is presented in Table 52.

[462] Cf. Subchapters 8.6.3, Subchapter 8.6.4; §97 (2) GWB related to the principle of transparency.

TABLE 52: Safeguards against opportunistic customer behavior

Sub-category	Safeguards against opportunism	Frequ.	Share [%]
Protection	Increase of exit barriers for the customer	16	94.12
	Increase of the entry barriers for competitors	16	94.12
	Common solution finding to increase customer involvement	14	82.35
	Implementation of common problem solution into specification / BoM	12	70.59
	Increase of customer loyalty	11	64.71
	Strong relationship management including setting preferences	10	58.82
	Opportunity costs scenario at relationship change	8	47.06
	Almost no protection possible because customer is compulsory-opportunistic	2	11.76
	No disclosure of expert knowledge, solution details, critical issues	2	11.76
	No insight into the value chain	1	5.88
	Demarcation by definition of interfaces and competencies	1	5.88

Table 53 shows that 16 (94.12%) of the surveyed manufacturers surveyed tried to secure an investment through early access to information in the context of the relationship management, and to use the information advantage in order to achieve a CA. With the same frequency and percentage share manufacturers support a strong involvement with the participating partners, both on the customers' as well as on the manufacturers' side. Concerning the marked expansion of the relationship between the customer and the issuing of references 15 (88.29%) of the manufacturers tried to win the trust of the customer and thus to protect their investment in the preparing phase of the award process. To present the customer the manufacturer´s achievement capabilities at an early stage, 10 (58.82%) of the manufacturers mention this a possible protective measure, while 6 (35.29%) of the manufacturers rely on integrating the customer solution within the technical concept and attempting to increase customer identification with problem solving by the manufacturer.

TABLE 53: Safeguards against opportunistic customer behavior in the preliminary phase of the award process

Sub-category	Safeguards to protect the pre-phase investment	Frequ.	Share [%]
Protection measures in the pre-phase of the award	Early access to information via relationship management as CA	16	94.12
	Support of strong involvement of the participating partners	16	94.12
	Strengthening of relationship management in order to build trust	15	88.24
	Targeted issuing and use of references	15	88.24
	Early presentation of achievement capabilities	10	58.82
	Increase of customer involvement by integration of the customer´s solution	6	35.29
	No 100% safeguard available	5	29.41
	Argument with the goal to achieve subjective assessment advantages	5	29.41
	Influencing and steering of the participants	5	29.41
	Factor combination: know-how, experience, expertise, relationship management	5	29.41
	Development of risk scenario against customer´s deviation from common solution	4	23.53
	Formulation of the draft of the specification / BoM	1	5.88

Less than a third of the manufacturers surveyed (5; 29.41%) admit that there is no 100% security of investments and therefore set out to achieve subjective evaluation advantages based on argumentation, influencing and steering the parties towards the customers' side with the goal of achieving subjective assessment advantages by the application of factor combinations based on know-how, expertise, experience and relationship management. A targeted risk scenario against possible deviation of the customer from the jointly developed problem solving occurs with 4 (23:53%) of the manufacturers, while surprisingly one (1; 5.88%) manufacturer for emample mentioned the formulation of the draft specification and the BoM for the customer as an appropriate safeguard.

10.4.1.5 Intermediate summary

The previous facts summarized show that manufacturers focus under market conditions dominated by a low number of available projects, strong

competition forced by weak European economies in competitor´s domestic markets, resulting in aggressive competitive behavior and decreasing prices, on differentiation factors related with relationship management with customers and third supporting parties. The collaboration with LUs, close contact and robust relationships with customers and key suppliers combined with the early involvement into projects, the early gaining of knowledge and a relationship network that results in synergetic partnerships are differentiation factors that are most relevant for German manufacturers of BHS in order to achieve CAs.

Additionally, the previous facts present a picture that shows relationship building by intangible factors, like trust, communication, the fulfillment of commitments, and the delopment of joint ideas and solutions, etc. as most relevant for the relationship between the customer and the manufacturer. The manufacturers follow the intention to safeguard the investment in determining factors, with a focus especially on the pre-phase of the award. To support this manuafacturers set on early access to information, the involvement of partners and the strengthening of the relationships in order to build trust. The integration of the customer´s solution and his early involvement and integration is welcome as a safeguard to build entry barriers against competitors with the purpose to achieve CAs. This will be also more detailed topic of the argumentation in the Subchapters 10.5, 10.6, 10.7.1, 11.1, and 11.2.

10.4.2 Expert group II: Customer

10.4.2.1 Market

The experts on the customers' side also had an ice breaker question for their market assessment. The subsequent evaluation of the different categories and their summary is presented in Table 53 and depicts the following.

- Project availability: All airports (8; 100%) indicate that the process for awarding contracts is based on a regulated procedure governing the participation of manufacturers in a tender.[463] At the same half of

[463] Cf. in detail Subchapter 8.6.4.

the experts (4; 50%) conceded that only a few procurement projects are currently known to German and European airports. Four (50%) of the surveyed airports stated that it is characteristic that due to an increasing proportion of transfer passengers[464] existing systems can be upgraded or expanded and the number of new systems is limited. This leads to strong competition (4; 50%) for the few new systems to gain awards and to stiff competition for jobs in the industry sector.

TABLE 54: Market evaluation by customers

Sub-category	Evaluation	Frequ.	Share [%]
Project availability	Award process is ruled	8	100.00
	Strong competition among manufacturers due to low number of available projects	4	50.00
	System upgrade or extensions at increasing numbers of transfer passengers	4	50.00
Behavior	Strong competition for sector related orders	2	25.00
Preferences	Preference on national manufacturers	8	100.00
	Ensuring system availability and baggage handling capacity	6	75.00
New entries	Entry difficulties due to preference for national manufacturers	8	100.00
	Only low number of manufacturers covering whole product range	6	75.00
	Low number of customers and manufacturers	2	25.00
	Technical and logistical complexity limits number of suitable manufacturers	1	12.50

[464] Cf. in detail Subchapter 8.4.

- Preferences: Following this development three-quarters (6; 75%) of the airports surveyed argue for focusing on ensuring system availability and the provision of baggage handling capacity, and they therefore prefer more national system manufacturers (8; 100%) because they have an access advantage due to their proximity.
- New entries: Six (6; 75%) of the respondents said that there were only a few manufacturers with a product range covering virtually the entire baggage handling tasks. In addition, the technical and logistical complexity further restricts the group of manufacturers (1; 12.50%), so that only a few meet equally few customers (2; 25%) that are associated with a limited number of projects.

All respondents (8; 100%) said that due to the preference for national manufacturers a barrier to entry for new entries would result, although this is not intended, and that in the interest of the contracting authority would contribute to the functioning of the procurement procedure and the relevant legal conditions.

10.4.2.2 Competitive advantage

In order to achieve a CA as a manufacturer supporting factors of the customer (airport) are necessary. Table 55 shows in summary the supporting factors that the customer can provide to the manufacturer. All 8 (100%) of the experts mention as crucial supporting factors the provision of adequate staff with appropriate skills, capabilities, knowledge and know-how for the task, and good cooperation with manufacturers, ensuring access to the project participants through the provision of information, experiences and airport specific knowledge. The granting of rights (e.g. access rights in security areas, preparation of the material containers, etc.) was mentioned by 7 (87.50%) of the experts as a supportive measure.This can be subsumed all under the term inter-organizational collaboration that was named by 2 (25.00%) of the experts named as an essential determining attitude. They also said that to realize the achievement without the support of achievement contributions by the airport in all phases of the implementation of the project, but especially in the preparing phase of the project to develop a system concept, would hardly be possible.

TABLE 55: Supporting factors to achieve competitive advantage

Sub-category	Supporting factors of the airport for achieving competitive advantage by the manufacturer	Frequ.	Share [%]
Support	Provision of adequate staff with appropriate skills, capabilities, knowledge and know-how	8	100.00
	Appropriate access to participating parties	8	100.00
	Information, experience, knowledge	8	100.00
	Granting of legal rights	7	87.50
	Inter-organizational collaboration	2	25.00
	Without support by airport the manufacturer has no possibility for achievement creation (early support)	2	25.00

Knowing the impact of specific conditions on the customer, like the tender-related product homogeneity, and the development of appropriate measures is necessary for a manufacturer in order to achieve CAs.

Concerning the basic specific conditions of product homogeneity, the experts mention the effects summarized in Table 56. Accordingly, all experts interviewed (8; 100%) mention the impact that all manufacturers have set on the technical basis, resulting in easier comparability of manufacturers. The manufacturers thus are forced to differentiate themselves from each other by factors that are of a non-technical nature (4; 25%). A simplification of the decision-making process is mentioned by all the experts (8; 100%) as a direct consequence of the product homogeneity. As a significant effect of product homogeneity 7 (87.50%) of the experts mentioned the effect that manufacturers' differentiating decisions have on the basis of certain product characteristics to be excluded, and showed that the differentiation of the manufacturers from each other in the preliminary phase of the project gains greater importance.

TABLE 56: Effects of product homogeneity

Sub-category	Effects by product homogeneity	Frequ.	Share [%]
Product homogeneity	All manufacturers use the same technical basis	8	100.00
	Direct and easier comparability of the manufacturers	8	100.00
	Manufacturers can differentiate only by non-technical factors	8	100.00
	Airport reduces its transaction costs	8	100.00
	Easier decision making process	8	100.00
	Manufacturers differentiating decisions on the basis of certain product characteristics are excluded	7	87.50
	Manufacturer differentiation: Importance of preliminary phase of the project increases	7	87.50
	Integration of the airport is optimally possible in the process preliminary to the award instead of in the implementation / installation phase	6	75.00
	Increasing importance of inter-organizational relationships	5	62.50
	Increasing relevance of relationship management and relationship variables	5	62.50
	Relationship management subjectively part of the assessment	3	37.50
	Generally advantageous for the airport	3	37.50
	Increasing ex-ante transaction costs of the manufacturer	2	25.00
	Forces manufacturer to non-product related differentiation measures	2	25.00
	Preference for well-known manufacturer due to lower risk	1	12.50

In contrast to the integration in the installation phase as shown on the manufacturers' side, the perspective of the airport experts (6; 75%) suggests that an integration of the airport in the preliminary phase of the contract (e.g. concept development, etc.) would be optimal.

Inter-organizational relationships and relationship management between the parties gain more importance (5; 62.5%) and play a subjective role (3; 37.5%) in the evaluation process. At the same time this increases ex-ante transaction costs of the manufacturer, since they need to make greater efforts, incurring corresponding expenses for relationship building, information gathering, etc.,

without being able to claim a contractually guaranteed refund.[465] Three experts (3; 37.50%) evaluated the effects of product homogeneity as generally beneficial to the airport. 1 (12.5%) expert mentioned that product homogeneity favors well-known partners based on subjective criteria in order to differentiate and so to reduce the risk of failure of the project.

As shown in Table 57, according to all experts (8; 100%), a manufacturer achieves advantages in competition by offering a problem-solving or an achievement package optimally for the airport, and meets an acceptable price level. At the same time the experts said (8; 100%) that a manufacturer would also achieve CAs if the customer were to be integrated in the development of the problem-solving and if the airport already has positive experiences and a good relationship with the manufacturer.

Six (75%) experts mention the unofficial set of preferences by the airport as a possibility for a manufacturer to achieve CAs. It is also advantageous if the manufacturer has positive references with leading airports concerning the tasks (LU) and can credibly make its expertise verifiable by this means (4; 50%). A minimal risk of project failure, and an active effort to ensure project success, is a crucial success factor in favor of the manufacturer for 37.5% (3) of the experts. Likewise, 37.5% (3) of the experts are convinced that a combination of a strong relationship management, references, and minimal project risk can lead a manufacturer to achieve a CA. Only 1 (12.5%) of the experts are of the opinion that a manufacturer achieves CAs when the relationship management with the airport is so good that other evaluation criteria fade into the background. Another manufacturer (1; 12.5%) mentioned the delivery of an economic offer associated with the classification as the best tenderer as a determining success factor for the manufacturer in achieving a CA. The results are summarized in the following table.

[465] Cf. Subchapter 10.4.1.2 (Tab. 37). Four (4) manufacturers mentioned the uncertainty of the investment as a serious success barrier.

TABLE 57: Factors determining success in competition

Sub-category	Factors determining success in competition	Frequ.	Share [%]
Success factors	Optimal solution or achievement package	8	100.00
	Meeting the accepted price level	8	100.00
	Airport integrated in finding a solution or development	8	100.00
	Already existing positive experience with the manufacturer	8	100.00
	Good relationship with the manufacturer	8	100.00
	Manufacturer unofficially set as a preference	6	75.00
	Manufacturer has positive references with leading airports with similar problems to solve and can present verifiable competence	4	50.00
	Risk of failure is minimal or non-existent	3	37.50
	Active effort by the manufacturer to lead the project to success	3	37.50
	Strong relationship management combined with references and low risk	3	37.50
	Such a good relationship with the manufacturer that in the evaluation allows other criteria to become secondary	1	12.50
	Economic offer associated with the classification as the best tenderer	1	12.50

If the project risks and uncertainties concerning the successful course of the project are low, this represents a value for the airport that can possibly allow compensation for the manufacturer.

As in Table 58, the prices do not represent the only decision criterion. 100% (8) of the experts said they were willing to pay a higher price if they were involved in finding convincing solutions. Additionally, 100% (8) also said that a positive relationship with management was evaluated by the manufacturer, who concluded that only a few difficulties should be expected in the project execution. 87.5% (7) of the experts said that the cheapest solution may not be the optimal solution for the customer's problem and that economic efficiency should be a consideration.

TABLE 58: Willingness to accept a higher price

Sub-category	Willingness to accept a higher price by customer integration	Frequ.	Share [%]
Price sensitivity	Yes, because the price is not the only decision criteria	8	100.00
	Yes, due to involvement in solution finding and solution development	8	100.00
	Yes, if the relationship with the manufacturer is good and promises no difficulties for the project execution	8	100.00
	Yes, because the cheapest solution must not be the optimal solution	7	87.50
	Economic efficiency is mandatory	7	87.50
	Risks, strength and weaknesses of the solution will be evaluated	6	75.00
	Economic aspects are subjectively influenced	2	25.00
	Yes, due to a better assessment of risks	1	12.50

The evaluation of the criterion of economic efficiency is subjectively influenced (2; 25%). The willingness to accept a higher price depends, for 6 (75%) of the experts, on the assessment of project risks and the strengths and weaknesses of the developed problem-solving, where for 1 (12.5%) of the experts an improved risk assessment procedure represents a determining factor for any willingness to accept a higher price from the manufacturer.

10.4.2.3 Customer integration

The customer usually accepts their integration by the incorporation of achievement contributions only when the benefits that they expect from the integration exceed the incurred expenses (Paul, 1998: 143).[466] Table 59 summarizes the customer's anticipated integration advantages. All airport experts who were interviewed (8; 100%) expect to have at any one time an overview of the progress of the project, enabling them to anticipate risks quickly by appropriate information and responding early to risks identified with appropriate measures. The objective is to avoid delays in the project and to provide a smooth procedure. Through participation in the co-development of the problem-solving all experts

[466] Cf. Subchapter 7.2.3.

(8; 100%) mention the advantage of bringing their own ideas and experience into the concept development and interpreting and designing the system concept to the specific requirements of the airport.

TABLE 59: Expected advantages by customer integration

Sub-category	Advantage expectation by customer integration	Frequ.	Share [%]
Advantage expectation	To always have an overview a of the progress of the project	8	100.00
	Speedy anticipation and reactions related to risks, avoidance of bottlenecks to secure the course of the project	8	100.00
	Integration of own ideas and experiences in concept development	8	100.00
	Knowledge of the common problem solving solution (co-development)	8	100.00
	Concept designed for the airport´s specific situation (customized)	8	100.00
	Ability to realize a manufacturer preference (combination) and forcing airport interests at the maximum point of solution safety (reduction of the overall risk)	8	100.00
	Improvement of specific knowledge and capabilities	7	87.50
	More independence from the manufacturer to ensure capacity	7	87.50
	Reputation and reference by providing the manufacturer with a platform to test new products	4	50.00
	Ensuring the project preliminary during execution	3	37.50
	Insight into the cost structure of the manufacturer to better assess the price level	2	25.00

All the (8; 100%) respondents saw the possibility of setting preferences for a manufacturer or for a combination of manufacturer as advantageous that can be for example achieved by increasing involvement through the existing experience within the airport. At the same time all (8; 100%) the experts mention this in connection with the reduction of the project risk through securing their own interests at the maximum level of security. The advantage of the acquisition of extension of specific knowledge (e.g. system design, engineering, etc.) and a corresponding increase of independence from the system manufacturer is mentioned by 7 (87.5%) of the experts interviewed.

Four (50%) of the experts mention increasing reputation as a potential advantage for the airport by providing manufacturers with a platform for the introduction of new products or technologies, clearly benefiting from the latest technologies and supporting and fostering dialogue between the airports. Three (37.5%) experts consider that a serious integration advantage for the airport is the possibility of securing the project in its entirety and in all its phases of the project path. Depending on the degree of integration 2 (25%) of the experts see the opportunity to gain information on the cost structure of the manufacturer, and thus to draw conclusions for the tender evaluation in the later stage.

The phases in which the experts saw a customer contribution in the context of CI are summarized in Table 59. All (8; 100%) experts specifically mention the performance contributions from planning prior to the official announcement by public notice or invitation to tender as suitable for the integration of contributions. This explains the creation of the concept of the system in which strong achievement contributions can be made. Support during the development, especially by experience, know-how and application-specific knowledge, is mentioned by 75% (6) of the experts. Furthermore, the adoption of service tasks (possibly as part of maintenance contracts) would be for the experts interviewed (8; 100%) another possible scenario. Two airports (2; 25%) mention significant contributions related to the field of project management and project control, especially in the interface management, such as an achievement contribution.

One (12.5%) of the experts sees possible key contributions by the airport in the selection of suitable project participants, as well as in the support of project-specific synergistic manufacturer combinations. Due to the obligation to comply with the principle of equality in the tendering phase 1 (12.5%) expert mentioned the integration of the customer in the preliminary phase of the tender as a crucial part of the achievement creation, since there already arise preferences that can determine the further activities of the airport for the integration of achievements, and in which the wish for integration into several phases of achievement creation was expressed.

Table 60: Achievement contribution by the customer

Sub-category	Possibilities for the achievement of a customer contribution	Frequ.	Share [%]
Customer contribution	Planning during preliminary phase of the project	8	100.00
	Creation and development of the system concept	8	100.00
	Service and maintenance	8	100.00
	Development due to experience, know-how and knowledge	6	75.00
	Project control, interface and project management	2	25.00
	Synergetic selection of project participants or manufacturer combinations	1	12.50
	Integration into several phases useful	1	12.50
	Integration and building preferences preliminary to the invitation to tender	1	12.50

At what integration point in time these achievement contributions are provided by the airport is summarized in Table 61. All the (100%) experts said that the time of the preliminary phase of the project was crucial to the integration point, in which the dialogue between all participants takes place and the manufacturer is faced with the problem, while all participants are trying to adapt and to customize already existing technical solutions, including the solution of the manufacturer. Seven (87.5%) experts state that an integration of achievements contributions by the airport during the procurement process is hardly possible. Two (25%) of the experts estimate that integration during the project in the production phase (after the award) can be carried out, because in complex customized projects execution deviations may occur rather than the originally offered achievement (e.g. deviation of in the BoM stated amounts of material due to structural conditions on site, etc.).

Two (25%) respondents mentioned that the integration of achievement contributions by the airport in several phases, and possibly project-specific in all stages of the collaboration with the manufacturer, can take place. This is substantiated by the fact that performance contributions can also be made by information and knowledge transfer through communication between the parties. This may extend over all the project phases.

Table 61: Integration point in time

Sub-category	Common solutions and achievements were developed…	Frequ.	Share [%]
Integration point in time	…in the preliminary phase of the project (crucial project phase)	8	100.00
	…in previous discussions with the participants	8	100.00
	…in the preliminary project phase when we tried to use already existing technical solutions with the manufacturer	8	100.00
	…not during the invitation to tender or the award negotiations, because integration there is not possible	7	87.50
	...during manufacturing of the system, because deviations from the tender are possible	2	25.00
	…in various phases up to all phases of the collaboration by the exchange of information, communication, knowledge, etc.	2	25.00

At what point the achievement contributions of the customer can be integrated is assessed by the experts and presented in Table 62. Accordingly, 100% (8) of the experts mention the creation of the system specification and the overall project planning as possible starting points. It is important to realize that the pre-selection of candidates of the manufacturer invited to tender and the combination of value-added partners in the form of project-specific cooperation of manufacturers, with having the goal of creating a system concept that corresponds with the requirements of the airport, is one of the key potential achievement contributions of the customer.

Furthermore, 75% (6) of the respondents mentioned the development of the basic concept of a system to be created as an achievement contribution of the customer, in which 50% (4) of the experts also mentioned achievement contributions in the development of a customized solution. In the course of this 3 (37.5%) of the responses relate to the fact that the customer has, due to their core competence in logistics services, no adequate development and manufacturing resources.

TABLE 62: Point of integration of the customer´s contribution

Sub-category	Integrative achievement contribution by the customer	Frequ.	Share [%]
Point of integration	Creation of the system specification and BoM	8	100.00
	General project planning	8	100.00
	Previous selection of manufacturer candidates invited to tender	8	100.00
	Combination of firms into value adding partners / cooperation	8	100.00
	Creation and development of the basic concept of the system	6	75.00
	Development of a customized problem solving solution	4	50.00
	Execution of the project / project management	3	37.50
	Due to the focus on logistics, no development or manufacturing resources available	3	37.50
	Previous to the process / in all phase of the process chain possible	2	25.00
	Equalization of the manufacturer´s information deficit	1	12.50

Thus the achievement contributions can be only incorporated into the execution or production phase of the BHS in a limited way. At the same time 25% (2) of the experts are of the opinion that the customer achievement contributions can be provided over the entire process chain of a project, with a special focus on the early project phases, especially prior to the announcement of the project, in which lack of information would be on a par with that of the manufacturer (1; 12.5%).

Eight (100%) of the experts estimate the involvement of the customer through the introduction of specific achievement contributions (Table 63) as necessary in the field of application-specific adaptation of standard systems, while 87.5% (7) said that the involvement of the customer is generally necessary, and has crucial and positive influence on the achievement results by the same objectives of the manufacturer and customer. 4 (50%) of the experts said that the crucial achievement push is triggered and executed by the airport (e.g. communication of the problem, invitation to tender, etc.).

TABLE 63: Need for customer involvement

Sub-category	Need for customer involvement	Frequ.	Share [%]
Involvement	Participation of airport-specific factors in application-specific adaptation of standard systems necessary	8	100.00
	Generally necessary and of crucial and positive influence on the achievement results by common objectives	7	87.50
	Crucial achievement push is triggered and executed by the airport	4	50.00
	Necessary for closing the information gap of the manufacturer related to the requirements	2	25.00
	Mandatory requirement for the modernization of already installed or older systems	1	12.50
	Participation is not necessary	1	12.50

Two (25%) experts mention the need for providing information for the manufacturer, or compensation for the lack of knowledge regarding the requirements of the customer to the achievements, and that these should be provided as a valuable contribution the airport can provide. For the modernization of older systems this is a mandatory requirement (1; 12.5%). The involvement of the customer is not mentioned by 1 (12.5%) expert.

The intensity of an achievement contribution by the customer is summarized in Table 64. All (8; 100%) of the experts describe an achievement contribution from the customer as necessary, because only the airport is able to describe its specific problem. Thus without the achievement contributions the risk would be high, so that the achievement creation of the manufacturer would not run optimally. The close cooperation with the manufacturer is essential and necessary in order to specify the required achievement, and also in order to learn more about the technical limits and to develop a system concept to be the basis for the tender documents (7; 87.5%). Additionally, cooperation in advance of the tender with the goal of budget security and ensuring the performance of the proposed system is also important.

TABLE 64: Contribution intensity

Sub-category	Contribution intensity factors	Frequ.	Share [%]
Contribution	Necessary because the airport can describe the specific problem / task only	8	100.00
	If no suitable integration of achievement contributions of the airport are possible, if a high risk of failure is likely	8	100.00
	Close collaboration specifies the required achievement / development as the basis for the tender	7	87.50
	Collaboration prior to the tender influences the project / budget safety / system performance positively	7	87.50
	Manufacturer is forcibly dependent on the contribution of the airport	6	75.00
	Supporting and purposeful achievement of the airport necessary	6	75.00
	Support in the execution (e.g. legal rights, media supply, co-ordination)	3	37.50

Three-quarters (6; 75%) of the experts indicate that the manufacturer is forced to rely on the cooperation of the airport in order to develop a targeted solution and if necessary to implement it (after receipt of the award) later in the project execution. According to 3 (37.5%) of the experts the support of project management is an essential achievement contribution of the airport, specifically the granting of rights, the supply of operational media (e.g. water, energy, etc.) and the coordination of other peripheral businesses involved in the project.

From the perspective of the airports the manufacturers maintain that several conditions for collaboration should be met. which are summarized in Table 65. It is thus crucial for 100% (8) of the experts that the manufacturer should understand the specific needs and requirements of the airport, and implement the appropriate expertise and skills that the contact partners or interfaces are defined by. Another important condition is to ensure appropriate access and availability of contact amongst the manufacturers (7; 87.5%), as well as the exchange of information between value chain partners (5; 62.5%).

TABLE 65: Manufacturer´s factors as a pre-condition for the integration of the customer

Sub-category	Manufacturer factors as pre-condition for the integration	Frequ.	Share [%]
Pre-conditions	Understanding of needs and requirements	8	100.00
	Existence of the right skills and competences	8	100.00
	Clear definition of the contact persons / interfaces	8	100.00
	Access to the relevant contact persons, availability	7	87.50
	Exchange of information between the value chain partners	5	62.50
	Collaboration of all involved persons with project success as a common goal	4	50.00
	Willingness to collaborate without safeguards prior to the order	2	25.00
	Professionalism, co-operative behavior, information about limits in achievements	2	25.00

The willingness to work of all involved participants and the pursuit of a common project success (4; 50%), as well as providing achievement in advance of a contract (2; 25%), in which the risk of non-consideration consists in the award process, is also essential. An operation characterized by professionalism and cooperative behavior and that discloses its manufacturer's achievement limits was also mentioned as an important condition (2; 25%).

Table 66 in example presents that the experts surveyed pay special attention to the context of CI in order to build a relationship with the manufacturer on intangible factors (8; 100%), as well as on appropriate and sustainable access to the involved contact partners.

TABLE 66: Aspects of special attention by the customer

Sub-category	Special attention to …	Frequ.	Share [%]
Attention	Relationship to the manufacturer by intangible relational factors	8	100.00
	Convenient sustainable access to contact partners	8	100.00
	Building a relationship network	6	75.00
	Integration of own ideas / contribution to solution	2	25.00
	Detailed knowledge of the added value chain of the manufacturer	1	12.50

Three-quarters (6; 75%) of the experts emphasize building a network of relationships, while 25% (2) mention the ability to integrate their own ideas, solutions and contributions as crucial. Only 1 (12.5%) expert pays particular attention to gaining detailed insight into the value chain of the manufacturer.

10.4.2.4 Relationship

The analysis of the responses of the manufacturers resulted in 94.12% (16) of the experts claiming that understanding customer relationships was a relevant and determining factor, especially for achieving CAs.[467] In order to make a comprehensive statement, it is important to supplement the manufacturer`s point of view with the customer's perspective and to discover what role the relationship with the manufacturer plays for the customer. A summarized view is given in Table 67.

[467] Cf. in detail Subchapter 10.4.1.2 (Tab. 36; Tab. 45).

TABLE 67: Role of the relationship to the manufacturer

Sub-category	Role of relationship to the manufacturer	Frequ.	Share [%]
Role of relationship	Reduces the risk of incorrect assignment and creates trust	8	100.00
	Affects price positively	8	100.00
	Easier to deal with project inconsistencies	8	100.00
	Useful in communication and project execution	7	87.50
	Unofficially strong role in all process steps	6	75.00
	Decisively influencing the project´s success	3	37.50
	Affects price negatively	2	25.00
	May play no special role in the allocation process	2	25.00
	Subjective part in the rating	2	25.00

All (8; 100%) of the airport experts surveyed said that the relationship with the manufacturer of the BHS and their trust helps to reduce the risk of incorrect or failed allocation, which is based on failed assessment of the manufacturer's achievement capabilities, leading to a lower price. Two (25%) experts said that a good relationship with the manufacturer can affect the price of the offered product negatively and that the relationship with the manufacturer should not play a role in the award process. The basis for this is the motivation of the manufacturer to get the order at a high assessment of security in order to adjust the price to the upper acceptable limit.

All (8; 100%) of the experts commented that a good relationship between customer and manufacturer may help to either avoid or to solve disagreements, to avoid losses in the project, and would improve communication (7; 87.5%) in the project implementation. According to the experts (6; 75%) the relationship with the manufacturer assumes an unofficial supporting role in all process steps, which can crucially influence the project success (3; 37.5%) and can be found again with a certain subjectivity in the assessment (2; 25 %).

For the airport the crucial factors for building a relationship with the manufacturer are shown in Table 68. All (8; 100%) of the experts interviewed mentioned that open, consultative and solution-oriented communication between manufacturers and the airport, as well as commitment compliance, are the basis

for building a relationship between the participating parties. The priority for the respondents is the development of common approaches to find solutions and to develop a common basis of trust. In the course of this the integration of the customer's solutions and their involvement has a supporting role and is central to all (8; 100%) of the experts.

TABLE 68: Relevant factors to build a relationship with the manufacturer

Sub-category	Relevant factors to build a relationship with the manufacturer	Frequ.	Share [%]
Relationship factors	Open solution-oriented communication	8	100.00
	Fulfillment of commitments as a basis for trust	8	10000
	Common approaches / development for solution finding	8	100.00
	Support / build-up of trust as a basis for co-operation	8	100.00
	Integration of solution approaches for the customer to increase involvement	8	100.00
	Positive reference by third parties for strengthening of reputation	6	75.00
	Combination of different relational factors	4	50.00
	Appreciation / Integration of existing experiences and competences	2	25.00
	Teamwork with the goal of project success	2	25.00

The positive feedback from third parties and thus the presence of strong references that strengthen the reputation of all project participants is mentioned by 75% (6) of the respondents as a key factor in building a relationship between the parties. For half (4; 50%) of the experts it is not a single factor but a combination of relationship-based factors crucial for building relationships between the parties. In the course of this 25% (2) of the experts said that the appreciation and integration of already existing experiences and competences, as well as collaboration in teams with the common goal of project success are relevant factors for building a relationship between the parties.

10.4.2.5 Intermediate summary

The previous chapters summarized presents a picture from the perspective of the interviewed customer experts. They assess the market for BHS as ruled related to the award processes and oberserve a strong competition between manufacturers for a limited number of available BHS projects. Important is the setting of preferences for national manufacturers in order to ensure the necessary capacities for the operational business of the customer (Tab. 54). Saving transaction costs, easier decision making processes and a integration of the airport in processes previous to the award is supported by the product homogeneity (Tab. 56). Due to the product homogeneity the experts characterizeAll interviewed experts mentioned the that intangible factors, like knowledge, experience, know-how, and information are crucial supporting factors necessary for a manufacturer to achieve CAs (Tab. 55). Determining success factors are according to the interviewed experts optimal achievement packages combined with lower risk (Tab. 67) and a accepted price level, the experience and relationship with the manufacturer, as well as the integration of the customer into the solution finding. Most important in this context is the relationship with the manufacturer. Driving factors are the relationship that is built on intangible factors, like trust, the fulfilment of commitments, communication, and the integration of the customer´s ideas in a joint solution (Tab. 68). The above mentioned points represent relevance-related selected examples of the findings and increase, according to the experts, the acceptances of a price that is above the market price level and opens the manufacturer the possibility to achieve above-normal rents and a CA. The Subchapters 10.5, 10.6, 10.7.1, 11.1, and 11.2 will discuss this more in detail in order to answer the research question.

10.5 INTERPRETATION

Based on the analysis of both expert groups discussed in the previous chapters the following chapters will present the interpretation of the data, which is based on the chapter on success factors for CI and the theory-based discussion of this dissertation. As explained in Subchapter 10.1, due to different perspectives and self-contained viewpoints, both expert groups will be considered separately from each other and will form the basis of the comparison in Subchapter 10.6.

10.5.1 Expert group I

10.5.1.1 Factor relation within the integrated achievement process

In order to interpret the results of the survey, it is necessary to consider the whole process of the integrated achievement creation.[468] Based on the performance dimensions of the achievement potential, the achievement creation process and the achievement result, the particularities of CI (Hilke, 1989: 10), and the evaluation of the answers of the experts, the following picture emerges.

Based on the market's perception of the experts, the market is described as an oligopolistic market[469]. This is characterized by strong competition from fewer manufacturers and by a few available projects and a low growth rate[470]. The German manufacturers of BHS are confronted with European competitors, who try more aggressive competitive behavior[471] to acquire the market share from established manufacturers due to the economic conditions in their local markets.

This external pressure on German manufacturers leads to a lowering of the established price level in the market[472], coupled with an increasing cost pressure, and a reduction in the attractiveness of the local market by declining margins, thus decreasing the chances of achieving economic rents (Peteraf, 1993: 186)[473].

Although the early exit by established manufacturers occurred through competition, the market is nevertheless interesting for producers with lower cost levels and possibly lower requirements concerning their profit expectations. In order to demonstrate to the customer their achievement potential[474] and thus their capacity and readiness for making a BHS (Kleinaltenkamp, 1993: 105), the manufacturers surveyed bring in, under the terms of legal requirements,[475] factors

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[468] Cf. Subchapter 7.2.1 (Fig. 9).

[469] Cf. in detail Subchapter 3.3.1.

[470] Cf. Subchapter 10.4.1.1 (Tab. 34, project availabiltiy, value: 4; 23.53%).

[471] Cf. Subchapter 10.4.1.1 (Tab. 34, behavior, value: 7; 41.18%).

[472] Cf. Subchapter 10.4.1.1 (Tab. 34, behavior, value: 4; 23.53%).

[473] Cf. Subchapter 2.2.

[474] Cf. in detail Subchapter 7.2.1.

[475] Cf. in detail Subchapter 8.6.

by which they want to differentiate themselves from the competition.[476] Tables 35 and 36 are to be interpreted accordingly regarding the use of tangible and intangible potential factors. A frequency distribution results from this, as presented in Table 69. The table shows that in addition to tangible factors, intangible factors are mainly used to represent the achievement potential with the goal of achieving competitive differentiation and heterogeneity between the manufacturers. The strong expression of the intangible factors (differentiation:[477] 158; relevance:[478] 243) shows that those factors are especially used to represent the performance potential, where the risk of imitation or substitution by the competition is low and thus the opportunity to achieve a CA appears to be high.[479] These are primarily relationship-based, human specific and information or knowledge-based factors, which affect inter-organizational co-operation between the integration partners and represent a high entry barrier[480] to the competition (Zimmer, 1999: 21). Itami and Roehl (1991: 12) state that these invisible factors "(…) are the most important factors for long term success", and for the achievement of CAs.

Relationship-based factors represent a key success factor for CI (Kurzmann and Reinecke, 2009: 203) and form the basis for the development of relational rents (cf. Subchapter 10.5.1.3; Duschek 2004: 62). This also highlights the evaluation of factor relevance presented in Table 35. There it is shown that the absolute number of citations of invisible or intangible factors, such as information (82), relationship (76), inter-organizational cooperation (68) and human specific factors (17) predominate in relevance. As visible or tangible inter-organizational factors have been specifically site-specific factors[481] (e.g. location advantages through proximity to the customer)[482] that were mentioned in the assessment of the market as well as in the factor relevance (3), while product-specific factors

[476] Cf. in detail Subchapter 10.4.1.1 (Tab. 35).

[477] Cf. in detail Subchapter 10.4.1.1 (Tab. 35).

[478] Cf. in detail Subchapter 10.4.1.2 (Tab. 36).

[479] Cf. Subchapter 4.2.1.

[480] Cf. in detail Subchapter 3.2.1.1.

[481] Cf. in detail Subchapter 5.3.1.

[482] Cf. Subchapter 10.4.1.1 (Tab. 35, value: 3; 17.65%).

relate to entry criteria of already developed system components as a technical reference, and fulfil a door-opening function[483], moving in due course further into the background.

TABLE 69: Tangible and intangible achievement potential factors of manufacturers

Differentiation factor	Tangible factor		Intangible factor	
	Differentiation [frequency]	Relevance [frequency]	Differentiation [frequency]	Relevance [frequency]
Relationship related	-	-	50	76
Human specific	-	-	33	17
Inter-organizational related	3	3	38	68
Product related	10	-	-	-
Information / knowledge related	-	-	27	82
Total	**13**	**3**	**158**	**243**

In summary, this shows that the consideration of the market by manufacturers in order to present their achievement potential, intangible factors represent the dominant factors for differentiation in the achievement potential of the manufacturer.

Considering the achievement creation process[484] as the next step in the integrated achievement creation process, the evaluation of the responses related

[483] Cf. Subchapter 10.4.1.1 (tab 35, value: 9; 52.94%).

[484] Cf. in detail Subchapter 7.1 (Fig. 9).

to the sub-categories factor relevance (Table 35), the access factor (Table 39), and collaboration (Table 46) shows that the process of achievement creation is initiated in a very early phase of a baggage handling project[485] through the introduction of customer contributions. The impulse towards achievement is initiated by a process of interaction with the customer (Kleinaltenkamp, 1993: 109), in which the airport integrates information or human specific resources in the process (Trommen 2002: 98), which shall enable the manufacturers to understand and to implement the required solution-oriented tasks. [486]

This can be shown in the relevance of the need to develop a specific understanding of the requirements of the airport in advance of the tender (Table 36; value: 14; 82.35%). Therefore this process is already ex-ante or in advance of a tender or contractual relationship between the manufacturer and the airport. This process transfers the beginning of the achievement creation in the preliminary phase of a BHS project. This may also lead to iterative new combinations of potential factors having either positive or negative[487] impacts on the achievement potential of the manufacturer.

The result of this is reflected in the achievement result, which is based on the combination of achievement bundles of the parties (Engelhardt et al., 1993: 402), in which the achievement contribution of the customer is rather a supportive service (e.g. project management) in the implementation phase of the project (Table 50, value: 4; 23:53%).

[485] Cf. Subchapter 10.4.1.1 (Tab. 35, value: 17; 100%).

[486] Cf. in detail Subchapter 7.2.1.

[487] E.g. a negative impact would be when problem-solving became unsuitable due to the potential factor combination.

10.5.1.2 Competitive advantage by inter-firm networks

To achieve a CA may largely depend on whether a manufacturer is able to compensate for a lack of their own resources by those of other firms, and to work cooperatively with these firms in a network.[488]

Duschek, 2004: 61) argues that the bundling of internal and external network resources is strategically relevant and may result in the development of resource-based inter-firm CAs. The evaluation of the manufacturer's responses shows that a synergetic combination of strategic relevant network resources occurs in several phases of the CI between manufacturers, airports and other network partners. In the early phase of a baggage handling project, support may be variously shared between the partner and the manufacturer. According to Table 38 there is support through customers and related third parties (e.g. planning consultants and sub-suppliers (value: 16; 94.12%); and employees of the customer (value: 15; 88.24%) are of crucial significance.

By sharing early information coupled with the possibility of influence[489] (e.g. by references[490]) concerning the development of customized solutions in advance of the outset of the procurement process, it is possible to activate the necessary potential factors or to combine one's own potential factors synergistically with those of the airport or other partners in order to anticipate industry developments.[491] It may also be desirable to generate first-mover effects[492] in order to understand the problem and to be able to develop a customized solution to achieve a CA[493] through an information and time advantage.[494] This allows the manufacturer the early selection of appropriate achievement partners and, in consequence, the early development of appropriate partnerships (Table 37, value: 17; 100%), as well as the compensation of deficits of

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[488] Cf. in detail Subchapters 3.2, 4.2.2 and 5.2.

[489] Cf. Subchapter 10.4.1.3 (Tab. 43, value: 16; 94.12%).

[490] Cf. Subchapter 10.4.1.3 (Tab. 36, value: 17; 100%).

[491] Cf. Subchapter 10.4.1.3 (Tab. 43, value: 16; 94.12%).

[492] Cf. Subchapter 10.4.1.3 (Tab. 43, value: 12; 70.59%).

[493] Cf. Subchapter 10.4.1.3 (Tab. 43, value: 16; 94.12%).

[494] Cf. Subchapter 10.4.1.3 (Tab. 36, value: 3; 17.65%; Tab. 37, value: 7; 41.18%; Tab. 40, value: 5; 29.41%).

internal potential factors and possibly a full achievement partner of the airport.[495] Table 49 illustrates that the selection, placement and combination of appropriate value-added partners and cooperation by all of the surveyed manufacturers (17; 100%), as well as the pre-selection of suitable competitors (16; 94.12%), is seen as an integral achievement contribution of the airport.

This is accompanied by elimination of the corresponding success barrier[496] and the reduction of phase-related transaction costs[497]. The resulting advantage for the manufacturer and their partners is thus based on an inter-organizational information-based network relationship that leads to CAs and relational rents (Dyer and Singh, 1998: 662; Duschek 2004: 62). Table 50 shows that in addition to the above mentioned contributions the achievement contribution of the customer in the early project phase is seen by the manufacturers mainly in the planning services (16; 94.12%), in creating specifications (16; 94.12%) and in the concept of the system (10; 58.82%), while only 23.53% (4) of the manufacturers identify achievement contributions of the customer (according to their capabilities) in the execution of the project. This refers to those phases occurring after the award of the project.

Table 52 shows that this is partly due to the fact that the manufacturer tries to avoid providing a detailed insight into the supply chain as well as crucial solution details, because of the obligatory opportunistic behavior[498] of the airport. This obligatory opportunisitic behavior will be supported by compliance with the basic principles of procurement law.[499] The principles of transparency, equal treatment (prohibition of discrimination) and the neutrality requirement oblige the airport to provide all tenderers with equal conditions in procurement procedures (e.g. information, data, etc.), in which the basic principles are only

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[495] Cf. Subchapter 5.2.

[496] Cf. Subchapter 10.4.1.2 (Tab. 37).

[497] Cf. Subchapter 10.4.1.2 (Tab. 42).

[498] Cf. in detail Subchapter 8.6.4, §97 GWB and §§ 20; 22; 29 SektVO.

[499] Cf. in detail Subchapter 8.6.4. Failure to comply with the fundamental principles may lead to legal actions by the disadvantaged tenderers against the contracting authority and thus may endanger the investment project (e. g. project schedule, project costs, etc.).

required to come forward for application from the beginning of the arward procedure.

Therefore after awarding the contract the achievement contributions of the customer can be thus limited to later project phases rather than on the transfer of intangible resources (e.g. rights, information, etc.). This in turn results in their combination with strategic network resources in all participating parties to CAs and relational rents.

10.5.1.3 Relationship as a key factor for competitive advantage

Table 37 shows that the manufacturers of BHS identified that overcoming the most important success barriers concerns relationship building with customers as well as the early development of appropriate partnerships (6; 35.29%), in addition to the development of appropriate access to the customer (7; 41.18%). According to Wecht (2006: 23) access to the right contacts assumes special significance, since this is the precondition for the contact and for communication with the relevant persons of the customer, and is thus a crucial factor for the development of an inter-organizational relationship management for the airport as an integration partner.

Table 38 shows that manufacturers use, for the development of appropriate customer access, intangible assets focused on the intensity and the strengthening of relations between participants (16; 94.12%). This is achieved through existing contacts (16; 94.12%, e.g. to customers, references, LU`s, etc.), networking, and the exchange of information (14; 82.35%) as well as on early and targeted expansion of sales activities (13; 76.47%). It is the aspiration of the manufacturers to establish a good, robust relationship with the customer in order that other evaluation criteria become secondary[500], and that the customer builds on intangible relational factors that favor of the manufacturer.[501]

An exchange of information concerning the requirements of the customer and his problems[502], insight into knowledge-based deficits of the customer, and

[500] Cf. Subchapter 10.4.1.2 (Tab. 41, value: 14; 82.35%).

[501] Cf. Subchapter 10.4.1.2 (Tab. 41, value: 10; 58.82%).

[502] Cf. Subchapter 10.4.1.2 (Tab. 42, value: 16; 94.12%).

the associated combinations with the manufacturer's potential factors, make the relationship between the two integration partners a unique, valuable, intangible asset.[503]

The manufacturer uses this asset as an information advantage[504] on which to base a problem-solving solution designed in collaboration with the customer. This results in a better evaluation and calculation of the project risk[505] as well as a related price basis[506] for the quotation. The high quality of this relationship acts as a bilateral benefit that generates a CA for the manufacturer, since both integration partners assure their risk through the formation of mutual trust.[507] The information advantage of the manufacturer achieves a temporal advantage over the competition (first moving supplier) and in consequence a CA. Through the information advantage the manufacturer achieves a temporary advantage over the competition, and a potential to act (e.g. first moving supplier), and in consequence gains a CA.[508] Additionally, Dyer and Singh (1998: 662) state that an idiosyncratic contribution of partners base their inter-organizational relationship on occupying a key position in achieving CA and above-average profits.

Table 45 shows the assessment of the manufacturer in terms of CA determinants, such as relationship based variables in a unique combination (16; 94.12%), the early securing of inter-project-specific partnerships (15; 88.24%), and a risk-reducing relationship management (10; 58.82%), as well as on intangible factors, such as the relationship variables of trust, commitment, communication and common understanding (7; 41.18%). This consequently leads to the setting of the manufacturer as a preference (3; 17.65%).

Table 51 shows that the manufacturer uses a combination of relational factors in order to build a customer relationship (17; 100%). Morgan and Hunt,

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[503] A breaking out of the idiosyncratic relationship could be connected to high transaction costs and represents an effective exit barrier (cf. in detail Subchapter 5.3).

[504] Cf. Subchapter 10.4.1.2 (Tab. 43, value: 16; 94.12%).

[505] Cf. Subchapter 10.4.1.2 (Tab. 42, value: 16; 94.12%).

[506] Cf. Subchapter 10.4.1.2 (Tab. 42, value: 13; 76.47%).

[507] Cf. Subchapter 10.4.1.2 (Tab. 43, value: 15; 88.24%).

[508] Cf. Subchapter 10.4.1.2 (Tab. 43, value: 12; 70.59%).

(1994: 20) state that variables such as commitment and trust are the key factors for CI-processes.[509] Litter and Leverick (1995: 16-17) point out that the building of trust is based on a relationship management with the right contacts; open, consultative and solution-oriented communication[510] and the compliance of commitments[511], as well as the willingness to support, fairness, competence (12; 52.94%), and responsibility.

In contradiction to the statement by Stotko (2005: 115) about the role of the sales organization of the manufacturers as a "oberflächliche"[512] role, this turns now to a crucial and determining role by the concentration of activities on the preliminary phase of the project[513], and the focus on the task is to develop a relationship management with the use of employees with appropriate skills[514]. This is the critical core function and success factor in the integration of the customer in a BHS-project.[515]

If a relationship based on variables with the customer is so good that the customer sets preferences in a way that other characteristics move into the background, then the relationship itself represents the crucial and deciding

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[509] Cf. Subchapter 10.4.1.4 (Tab. 51, value: 16; 94.12%).

[510] Cf. Subchapter 10.4.1.4 (Tab. 51, value: 17; 100%).

[511] Cf. Subchapter 10.4.1.3 (Tab. 47, value: 16; 94.12%).

[512] Translation from GER according to Stotko (2005: 115): “superficial”.

[513] Cf. in detail Subchapter 10.4.1.3 (Tab. 46).

[514] Cf. Subchapter 10.4.1.4 (Tab. 51, value: 15; 88.24%), Subchapter 10.4.1.3 (Tab. 46, relationship variables, value: 16; 94.12%, trust / commitment, value: 16; 94.12%; knowledge / information / know-how / references, value: 15; 88.24%, sales intensity / interpersonal compatibility, value: 15; 94.12%), Subchapter 10.4.1.3 (Tab. 47; communication as a motivation factor to collaborate, value: 16; 94.12%).

[515] Cf. Subchapter 10.4.1.2 (Tab. 39, sales activity, value: 13; 76.47%), Subchapter 10.4.1.2 (Tab. 40; cooperative collaboration, value: 16; 94.12%; early use of relationship / building trust, value: 15; 88.24%; early support to the customer, value: 15; 88.24%; receiving knowledge about a customer´s problem, value: 13; 76.47%).

success factor for the integration of the customer[516] (Frey, 1991: 46), because the relationship between the manufacturer and the airport is quite different from the usual customer-supplier relationship and significantly supports the formation of inter-organizational quasi-rents (Duschek 2004: 62) in the form of relational rents (Dyer and Singh, 1998: 661-662). This represents for the manufacturer a decisive CA, particularly under conditions of relative product homogeneity as presented in the BHS industry.

10.5.1.4 Process orientation

Tables 46, 47 and 48 show that manufacturers substantially differentiate a BHS-project into three phases into which the customer's achievement contributions can be allocated: the preliminary phase (pre-phase), the implementation (execution) phase and the phase following completion of the implementation. Due to the special conditions of the award decision and the previously set product homogeneity there are phases named that are ex-ante to the decision, the point of decision and ex-post of the decision. The ex-ante and the ex-post decision phases were separated by the award decision of the airport (point of decision). The focus in this chapter is on the ex-ante and ex-post phase of the project. This is due to the internal character of the award decision. In the further course of this study all three phases will be of relevance for further consideration.

Ex-ante to the decision therefore includes the period from the first information about the project (regardless of a different temporary project beginning on both customer and manufacturer side) through the tendering phase, and finishes prior to the internal decision of the customer (point of decision). The ex-post phases starts directly after the internally taken decision from the customer and includes the executive implementation of the project, ending with the expiry of the warranty.

The evaluation of the manufacturer shows that they mainly focus on the phase of the project which allows them to enter the project, as the process

[516] Cf. Subchapter 10.4.1.2 (Tab. 41, preference, value: 16; 94.12%; other criteria than relationship secondary, value: 14; 82.35%).

conditions during the tender phase or the tendering process are given by the legal basis.[517]

This situation is mainly given in the early ex-ante part of the decision phase[518] of the project, because manufacturers try to show the customer their manufacturer-specific achievement potential and so synergetically combine manufacturer-specific with customer-specific potential factors into activity bundles (Hinterhuber, 1994: 60) of the interacting partners in order to motivate the customer into cooperation.[519] Therefore the manufacturer prepares a fundamental transaction (Williamson, 1985: 61-63) while trying to develop non-specific ex-ante achievement relations, which will be ex-post specifically by the decision of the customer between the manufacturer and the airport.

According to Table 50 the points at which to integrate the customer can be seen in the selection and combination of partners (17; 100%), and the selection of candidates (manufacturers) invited to tender (16; 94.12%), creating specifications (16; 94.12%) and basic concepts (16; 94.12%) as well as developing a customized solution (12; 70.59%). All achievements mentioned are achievement contributions by the customer, which can be provided only in an early stage in the progress of the project.[520]

In the early ex-ante to the decision phase the airport has already been working internally on the project, has relevant information and has already planned and deployed internal customer-specific resources. In contrast, the manufacturer usually receives information (e.g. about sales contacts, networks or existing contacts from previous common projects) if and when the customer has resources already invested. Therefore the manufacturer tries in this phase of the

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[517] Cf. Subchapter 8.6.4 (Fig. 34a; Fig. 34b).

[518] Cf. Subchapter 10.4.1.2 (Tab. 45, unique combination of manufacturer and customer related factors based on relationship variables, value: 16; 94.12%; early endorsement of valuable project partnerships, value: 15; 88.24%; early information, value: 5; 29.41%).

[519] Cf. the following chapters: Subchapters 7.2.1, 10.4.1.3 (Tab. 46-50), 10.5.1.1, 10.5.1.2., 10.5.1.8.

[520] Cf. Subchapter 10.4.1.3 (Tab. 50, value: 6; 35.29%).

project to motivate the customer to cooperate as early as possible [521] in order to obtain the necessary information the manufacturer needs to align the achievement potential. This equalizes the deficits in the potential factors of the airport and is perceived by customers as a valuable contribution to the project. As motivators the manufacturers apply a combination of factors mentioned in Table 46, such as the use of relationship variables (16; 94.12%)[522] to build a relationship of trust (16; 94.12%). Here the focus is upon intensification of sales support to the customer (16; 94.12%) through inter-organizational compatible contact persons (16; 94.12%) and the use of relational[523] intangible factors, such as solution competence and innovativeness, communication and compliance to commitments. In addition to the inclusion of references (15; 88.24%) the know-how and experience of the customer (16; 94.12%) is another factor that should motivate the customer to participate, and to help integrate them into the creation of solutions that helps develop the customer´s transaction-specific integration potential to be human asset specific (Dyer and Singh, 1998: 662). Zernott (2004: 66) states that the customer then develops into a supporter or a quasi-employee[524], whose successful integration within the CI-process represents a valuable intangible asset that makes the achievement ex-ante and so specific that this can act as a mobility barrier against other competitors with the potential to remove them from the competition (Dietl, 2007: 1751).[525] Table 49 shows the access to relevant contacts (16; 94.12%), employees with the necessary skills (15; 88.24%), understanding customer needs (15; 88.24%) as well as open and targeted information (13; 76.47%) between the partners.

Schindler (2007: 70) states that the high relationship-specific involvement of the airport leads to the development of transaction specific common knowledge, lowers the risk of uncertainty between the partners by the increase of trust[526] and protects investments already made. This leads according to Zernott (2004: 66) to

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[521] Cf. Subchapter 10.4.1.3 (Tab. 49, value: 4; 23.54%).

[522] Cf. also Subchapter 10.5.1.3.

[523] Cf. Subchapter 10.4.1.3 (Tab. 49, value: 10; 58.82%).

[524] Cf. Subchapter 7.6.1.

[525] Cf. Subchapter 5.3.1.1.

[526] Cf. Subchapter 10.4.1.3 (Tab. 46, value: 16; 94.12%).

the fact that the airport identifies itself with the manufacturer and the common solution, sets internal preferences and defends them against alternatives[527]. This provides the preferred firm a relational CA that leads to relational rents. This ex-ante selection represents a safeguard for the manufacturer and the airport to protect investments made in a phase that is not contractually fixed between the two achievement partners.

As Table 47 shows, the conclusion of the contract is made on the commitment of both parties from the ex-ante non-specific achievement relationship to a specific contractual fixed-achievement relationship, in which the customer is motivated to contribute through proactive information from the manufacturer concerning the progress of the project (16; 94.12%), commitments (16; 94.12%), and a professional approach to project implementation (14; 82.35%). Furthermore, application-specific solutions can be developed for the customer to ensure the achievement of a specific goal (3; 17.65%) and thus to increase the involvement of customers. This strengthens the trust between the actors (13; 76.47%) and reduces bilateral project risk during the implementation of the project. During the ex-ante procurement process, the application of sound procurement principles ensures that the manufacturer's ability to influence the airport is reduced.[528]

Finally, at the point of decision the manufacturer usually has no direct influence (e.g. by voting, etc.) on the internal decision of the customer. The manufacturer's success and the achievement contribution of the customer then depends essentially on the inputs of the manufacturer in the early phase ex-ante to the decision. This means prior to the start of the procurement process. The quality of the ex-ante combination of potential factors of the integration partners and the resulting achievement bundle therefore affect the success of the CI in the implementation phase ex-post of the decision. Tables 48 and 50 show that only joint training for repair and maintenance of the BHS (11; 64.71%)[529] and the

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[527] Cf. Subchapter 10.4.1.2 (Tab. 40, value: 13; 76.47%, Tab. 41, value: 3; 17.65%).

[528] Cf. in detail Subchapter 8.6.4, §97 GWB and §§ 20; 22; 29 SektVO.

[529] Cf. Subchapter 10.4.1.3 (Tab. 48).

acquisition of project management tasks (4; 23.53%)[530] determine the integration of the customer in the ex-post of the decision phase, making the joint commitment of partners complete.

10.5.1.5 Targeted use of resources

As discussed in Subchapter 7.6.2 Wildemann (1996: 17-18) relates avoiding losses through dissipation to the question of the nature of the achievement and the corresponding result related to its influence on the value of a firm. Of particular value are those achievements that are appreciated by the customer and lead to an increase in the value of the product. Therefore, value creating character may have also activities leading to the specification of the required achievements, and leading to a substantive or qualitative increase of value and thus supporting the achievement creation or making it possible, even if the return can only be realized at a later stage after the achievement is made.

The concentration of the manufacturers on substantiating and realization of the achievement, especially in the early phase of a BHS-project and thus on the ex-ante phase, shows the manufacturer's aspiration as early as possible, and by strengthening the sales-focused technical customer support[531] gains information about the task and the achievement specification in order to anticipate risks[532] and to carry out a combination of potential factors[533] and to develop an affinity for the customer's problem.[534]

However, this is connected to the manufacturer with some uncertainty in capital investment by the use and remuneration of the implemented potential factors by the customer.[535] In order to protect themselves from loss of investment

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[530] Cf. Subchapter 10.4.1.3 (Tab. 50).

[531] Cf. Subchapter 10.4.1.3 (Tab. 46, value: 16; 94.12%).

[532] Cf. Subchapter 10.4.1.2 (Tab. 42, achievement specification, value: 16; 94.12%; risk evaluation, value: 16; 94.12%; precise calculation, value: 13; 76.47%) and Subchapter 10.4.1.3 (Tab. 49, understanding of customer´s needs and requirements, value: 15; 88.24%).

[533] Cf. Subchapter 10.4.1.2 (Tab.41, value: 5; 29.41%).

[534] Cf. Subchapter 10.4.1.3 (Tab. 46, problem affinity, value: 15; 88.24%).

[535] Cf. Subchapter 10.4.1.2 (Tab. 37, value: 4; 23.53% and Tab. 44).

in potential factors during this phase, the manufacturer endeavors by means of high information quality[536] to combine internal and external factors together with the customer and to work on an optimal solution for the customer´s problem[537], and thus to realize a valuable partnership.[538, 539]

At this early stage the factors have been determined that promise a unique combination of customer-specific factors and related benefits. [540] Table 46 shows that there are intangible potential factors, such as problem-solving competences (16; 94.12%), the integration and use of customer knowledge (16; 94.12%, Zernott 2004: 68)[541], the targeted application of know-how, references (15; 88.24%) and relationship variables (16; 94.12%), These reduce for the manufacturer and the customer the risk of incorrect allocation of an award and provide achievement related value for the customer based on relational factors, which in turn gives the manufacturer a preference as remuneration and thus a CA.

The development of an optimal problem-solving solution and the objective of protecting against opportunistic behavior from the customer through the implementation of the optimum solution in the system specification[542] is not enough in the long-run to defend the preferred manufacturer's CA in the use of potential factors. This is due to the fact that with sending the system specification and the BoM, all approved manufacturers for the award procedure gain access to the quasi-optimal solution. This is a CA for the manufacturer based solely on technical considerations, and is more or less relative. To avoid investment losses

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[536] Cf. Subchapter 10.4.1.2 (Tab. 44, competitive advantage by the quality of information, value: 10; 58.82%).

[537] Cf. Subchapter 10.4.1.2 (tab 41, value: 16; 94.12%).

[538] Cf. Subchapter 10.4.1.3 (Tab. 49, value adding partnership, value: 5; 29.41%).

[539] This represents one of the most important success barriers to achieve competitive advantage (cf. Tab. 37).

[540] Cf. Subchapter 10.4.1.2 (Tab. 45, unique combination of customer and manufacturer related factors, value: 16; 94.12%)

[541] Cf. Subchapter 10.4.1.4 (Tab. 51, integration of the customer´s solution approach, value: 15; 88.24%)

[542] Cf. Subchapter 10.4.1.4 (Tab. 52, value: 12; 70.59%).

the manufacturer can, under a condition of technical homogeneity, only use the intangible factors from the previous and the early ex-ante phase, and defend the original received preference and its CA. Table 52 shows that this strong relationship management (10; 58.82%), and the general increase of the customer´s exit barriers from the relationship (16; 94.12%) is a strong barrier for entry (16; 94.12%) in conjunction with the retention of knowledge about critical solution details (2; 11.76%), and all this plays a major role and protects the manufacturer against opportunistic customer behavior.

Table 44 shows that manufacturer's investment in the preference-forming combination of manufacturer- and customer-specific potential factors is successful for the manufacturer, if this is able to compensate for the impending loss of the investment by obtaining the order (17; 100%) and unique access to customers (17 100%) and by this means obtain access to cumulative knowledge (Dyer and Singh, 1998: 666).

Table 47 shows that the manufacturers in the ex-post phase strive to avoid resource losses when combining potential factors to achievement bundles[543] through proactive communication (16; 94.12%) by making clear competency definitions and interfaces[544] in the form of the installation of an escalation level (4; 23.53%), the involvement of the customer (3; 17.65%), especially for the common development of solutions for securing the project operations (3; 17.65%) and the increase of common concepts[545], as well as to care for a strong relationship management on the basis of trust (13; 76.47%).

Due to the specialization of the airport on operational baggage logistics processes, its expertise focuses less on the production of a BHS. This confirms Table 50 and illustrates that the priorities of the achievement contributions of the airport were seen by the manufacturers to be in the field of project planning and

[543] Cf. Subchapter 7.2.1 (Fig. 9).

[544] Cf. Subchapter 10.4.1.4 (Tab. 52, value: 1; 5.88%).

[545] Cf. Subchapter 10.4.1.3 (Tab. 48, value: 8; 47.06%).

project management due to the increasing complexity of BHS. The integration of achievement contributions by the airport is difficult.[546]

The manufacturer protects himself against losses in the ex-ante phase[547] through clear divisions of tasks that counteract the opportunistic behavior of the airport. Table 52 shows for example the definition of competences and interfaces (1; 5.88%), avoidance of transparency in the value chain (1; 5.88%) and solution details (2; 11.76%) of the manufacturer and the building of opportunity costs (8; 47.06%).

10.5.1.6 Early acquisition of information and knowledge

Based on the manufacturer´s success barriers to achieving CA, Table 37 shows that significant success barriers are identified by the manufacturers based on the date of certain activities. The manufacturers mention here especially the early development of appropriate partnerships (17; 100%), the short time period available for building a relationship with the client, beginning with the notice of the project up to tender (12; 70.59%), as well as access to decision-makers and planners (7; 41.18%). Therefore it is necessary for manufacturers already in the ex-ante phase of the procurement process and within the phase as early as possible, preferably at the preliminary announcement or publication of the project, to start with activities that can give manufacturers an advantage over their competitors. Table 37 shows that receiving early information (7; 41.18%), when associated with a temporary information advantage, which is the basis of the manufacturer for the selection and orientation of manufacturer-specific potential factors[548], is necessary for the project, especially where the manufacturer is already able to equalize the deficiencies of his potential factors as a key strategy to build CAs.[549]

It is the goal to combine customer-specific potential factors with those of the manufacturer so that at the appropriate time a suitable combination of factors

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[546] Cf. Subchapter 10.4.1.3 (Tab. 50, project planning, value: 16; 94.12%; project management, value: 4; 23.53%, decreasing contribution with increasing complexity, value: 2; 11.76%).

[547] Cf. Subchapter 10.4.1.4 (Tab. 52).

[548] Cf. Subchapter 7.2.1 (Fig. 9).

[549] Cf. Subchapter 7.6.3 and Wildemann (1993: 27-28).

becomes available that the competition cannot provide in the short-term. Table 36 shows that early entry into the project and supporting it from the beginning (9; 52.94%), as well as understanding the requirements of the customer (14; 82.35%) preliminary to the tender procedure (17; 100%) as well as consulting with the customer in advance of the procedure (17; 100%) present significant cornerstones of differentiation from the competition and can provide the manufacturer with a temporary advantage in advance of a competitor´s activity.

Information received at an early stage based on findings means that the manufacturer and the customer are able to invest in potential factors in such a way that they result in an optimal combination and thus in optimal performance bundles. Therefore, Dyer and Singh (1998: 666) state that the contact between the manufacturer and the customer leads to the exchange of specific knowledge and the opportunity of acquiring trust, coupled with the (temporary) reduction or restraining of opportunistic behavior[550], inter-organizational learning and a resulting increase in the partner-specific absorptive capacity, which offers the potential to generate relational rents.[551]

Table 41 shows by the success factors identified and based on the integration of the willingness of the customer (14; 82.35%), as well as on early work on problem-solving for the customer (16; 94.12%), which promises to achieve the acceptable price level, and (16; 94.12%), coupled with the resulting common knowledge, provides the manufacturer the chance for a customized combination of tangible (e.g. product related advantages) and intangible factors (5; 29.41%). This helps to build a strong customer relationship. The customer relationship can be so good that the customer sets preferences for the common solution based on their involvement, and also defends the solution (16; 94.12%), while other evaluation criteria become secondary (14; 82.35%).

Table 41 shows that the development of knowledge leads at an early stage of the project to the realization that the manufacturer and the airport develop exit barriers from the relationship (10; 58.82%), because they are faced with the loss of their investments in the combination of potential factors. At the same time this raises the height of the entry barrier for the competition (5; 29.41%) and thus to a

[550] Cf. Subchapters 10.4.1.4 (Tab. 52); 10.5.1.2 (fn. 499), and 10.5.1.3 (fn. 503).

[551] Cf. in detail Subchapter 5.3.2.1.

CA in the ex-ante phase of the project in favor of the preferred manufacturer, as well as to inter-organizational quasi rents on the basis of idiosyncratic contributions from the partners (Duschek 2004: 62), and results in relational rents (Dyer and Singh, 1998: 662).

10.5.1.7 Increase of deterministic process shares

The development and production of a baggage handling system is usually based on the specified requirements of the airport, which will be described in a system specification which is part of the tender documents. Whether a manufacturer is able to meet the requirements of the customers depends on how much time is available to draw up its potential factors with those of the airport according to the customer´s achievement requirements and to compensate for any deficits.[552] Table 37 shows that the available time for the manufacturer during the tender process to create this combination of factors is insufficient to arrange and organize his potential factors accordingly. This for example is clear, inter alia, in the points: the offer period for the development of relationship management is too short (12; 70.59%), early development of appropriate partnerships (17; 100%), technical advantages cannot be represented (12; 70.59%), deviations from specification possibly only with previous approval for side-offers (16; 94.12%). Table 41 shows that the manufacturer has the opportunity only to circumvent this success barrier by attempting to align its potential factors at a very early stage of the project according to the customer's requirements (5; 29.41%), to develop an information and knowledge advantage[553] over the competition, as well as good customer relations (14; 82.35%), in which the customer is willing to set preferences based on intangible relational factors (10; 58.82%).

A high involvement or degree of integration in the customer regarding the development of a common solution, and possibly an involvement in the customized adaptation of proprietary or manufacturer-specific standard components and systems[554], as well as the willingness of the customer to invest potential factors in the inter-organizational integrative collaboration (14; 82.35%)

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[552] Cf. Subchapters 5.2 (fn. 165), 5.3.3.1, 7.6.5, 10.5.1.4 and 10.5.1.6.

[553] Cf. Subchapter 10.4.1.2 (Tab. 40, value: 5; 29.41%).

[554] Cf. in detail Subchapter 8.5.1 to Subchapter 8.5.2.5.

are essential success criteria. On this basis it is possible that the manufacturer receives complete and valid information about the required achievement, and to obtain the use of necessary internal and external factors and their potential for common achievement bundles. Fließ (1996: 92-93) and Zernott (2004: 70) states that in this way the manufacturer and the airport have opportunity to agree very early about the objectives in the project and to clearly define partner specific partial achievements, and therefore achieve transparency in the provision of achievements for the integration partners.

If the manufacturer misses the chance to describe the performance together with the customer in the early ex-ante phase of the project due to a lack of deterministic shares in the process, then he is confronted in the tendering phase with an achievement specification as well as the terms of reference and the associated risk of unsuitable factor combinations resulting in a suboptimal achievement bundle. This will result in a competitive disadvantage and must be optimized ex-post after receiving the award in order to avoid friction losses and dissipations in the implementation phase.

10.5.1.8 Increase of process awareness

Fließ (1996: 62) states that if the manufacturer is able to entirely eliminate or reduce the uncertainties associated with the achievement contributions by the airport, then this represents a significant CA for the manufacturer in a CI-project. Table 37 shows that the uncertainty in the remuneration of invested potential factors (4; 23:53%) is a barrier to success in achieving CAs. The manufacturer can counteract the uncertainty if he succeeds as early as possible in the process to clarify and to explain the customer the importance of the quality and the timing of his achievement contributions in the success of the project (Fließ, 1996: 92-93).

Table 50 shows that customer contributions are anticipated in the early ex-ante phase. Also expected are achievement contributions related to the selection and combination of cooperation partners (100% 17)[555], the creation of the system specification (16; 94.12%), the development of a custom-specific problem-solving solution (12; 70.59%), and the development of the basic concept of the system (10; 58.82%), as well as the planning of the BHS-project planning (16; 94.12%).

[555] Cf. Subchapter 10.4.1.2 (Tab. 45, value: 15; 88.24%).

In the course of this the focus is mainly on the preliminary phase of the project (6; 35.29%) and less in the execution or the ex-post phase of the project (4; 23:53%). The more complex the solution, the more difficult it is to integrate the achievement contributions of the customer (2; 11.76%). Tables 46 to 48 show that the degree of integration decreases as the project phases progresses. The sooner[556] the manufacturer is able to specify and to describe the anticipated achievement together with the customer, and to define the anticipated achievement shares and their quality, the less room do risk factors occupy in the project. Risk reduction is based on factor combinations that reduce the risk of both partners, and are therefore an important success factor for achieving a CA.[557] The crucial factors are combinations of other factors based on the relationships between the actors (16; 94.12%), and these cannot be provided by the competition in the short-term (16; 94.12%). The more targeted the manufacturer is in integrating the customer with valuable achievement contributions according to defined rules between the partners (Fließ, 1996: 94), and to reduce the project risks[558], the better can the manufacturer generate a CA.

10.5.1.9 Integrativity

The evaluation in Table 40 shows that the manufacturers aspire to collaboration with the customer (16; 94.12%) and are thus interested in a common solution to the customer´s problem on the basis of an existing product base[559] (16; 94.12%). If the customer agrees to this cooperation, there is a transformation of the business relationship (Zernott 2004: 72) between two actors: the supplier and the achievement partner.

Engelhardt and Freiling (1995: 37) state that in the context of this achievement relationship the individual transaction of the development (ex-ante), planning (ex-ante) and construction or installation (ex-post) of a BHS are in focus and will motivate the transaction partners towards cooperative operations. Table

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[556] Cf. Subchapter 10.4.1.2 (Tab. 45, value: 5; 29.41%).

[557] Cf. Subchapter 10.4.1.2 (Tab. 45, value: 10; 58.82%).

[558] Cf. Subchapter 10.4.1.2 (Tab. 45, value: 10; 58.82%).

[559] The manufacturer is interested in using their already designed product portfolio in order to reduce development costs for customer-specific components.

49 shows the indispensable factors for motivating customers to collaborate. As essential factors the manufacturers have identified access to the relevant contact persons (16; 94.12%), which allows them to understand the needs and requirements of the customer, including the right skills, know-how and experience of the participants (15; 88.24%). By using intangible relational factors (10; 58.82%) and an open targeted communication (4; 23:53%) the manufacturer opens up the customer towards cooperation (4; 23:53%) and supports the exchange of information between value chain partners (13; 76.47%). Preferences on the manufacturer and the customer side are easier to understand (4; 23:53%) and can be included in the combination of achievement bundles.[560]

Table 40 shows that the manufacturer aims to establish a joint solution as the basis of the specification in the tender documents (15; 88.24%). Through the cooperative collaboration with the customer and the integration of the commonly developed problem-solving solution there occurs in the tender documents a temporary advantage for both partners. The manufacturer has the advantage of information and know-how, while the airport has a preferred solution that, due to its high degree of integration, is defendable both internally and externally (13; 76.47%) and is only pro-forma dependent on the supply of alternatives.

As Tables 46-48 shows, different from the theoretical arguments in the cited literature in Subchapter 7.6.6, is in this case the maximum integration of the achievement contributions of the airport before closing the contract, and early in the ex-ante phase of the project, even before the publication of the procurement project. Here then is the intensity of the intervention or the involvement of the customer most pronounced in the opinion of the manufacturer. If it is possible for a manufacturer to motivate the airport into setting preferences and to defend them during the procurement process then the preferred manufacturer successfully installed an entry barrier against the competition and achieves a CA, enabling him to reap the award in the procurement process. In this cause the ex-ante phase is crucial to success for the manufacturer and is in the following in detail discussed in the Subchapters 10.6.1, 10.7.1, 11.1, and 11.2.

[560] Cf. Subchapter 7.6.6.

10.5.2 Expert group II

10.5.2.1 Factor relation within the integrated achievement process

Table 54 shows that from the perspective of the airport experts the availability of projects is limited (4; 50%), and preferences for domestic producers (8; 100%) are made as well as the intention of the airport to reduce the risk of unavailability of the system capacity (6; 75%)[561]. This determines the behavior of market participants and makes it more difficult for the competition (4; 50%). The airports provide projects when they need to invest in the expansion of existing equipment (4; 50%) due to increasing numbers of passengers. Prevailing preferences (8; 100%), the limited number of full-service providers (6; 75%) as well as the technical and logistical complexity of baggage handling projects restrict access for new suppliers (1; 12.5%), and this strengthens the preferences of the airports in favor of national manufacturers (8; 100%).

Due to the regulated (8; 100%) procurement method[562] above the thresholds, a bound choice for the airport as a contracting authority, the manufacturers' products are homogenized; the effects on the airport are summarized in Table 56. Due to the identical technical basis, which is a response to the system specification, the manufacturers only differ by factors that are not of a technical nature and thus are not product-related (8; 100%). This simplifies for the customer the comparison of offers from the manufacturers (8; 100%) and lowers the tender evaluation that had been accumulating airport-specific ex-ante transaction costs (8; 100%) by the simplification of the decision making processes (8; 100%). Thus the customer accepts the fact of product homogeneity as advantageous (3; 37.5%).

Table 56 shows that for the airport the ex-ante phase of a baggage handling project, specifically the pre-phase of the project, is gaining importance as the airport can be perfectly integrated compared with the implementation phase of the project (6; 75%), and can form the desired preferences in cooperation with the manufacturers. At this stage inter-organizational relationships tend to win out (5; 62.5%) based on relationship variables that apply relationship management methods (5; 62.5%) that subjectively enter the manufacturer's assessment (3;

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[561] Cf. also Subchapter 10.4.2.2 (Tab. 56, value: 1; 12.5%).

[562] Cf. in detail Subchapter 8.6.5 (Tab. 26).

37.5%), which is of greater importance for the airport (5; 62.5%). Schindler (2007: 70) states that a relationship based on relationship variables thereby supports transactions[563] taking place between the actors and makes effective and efficient due to the low risk involved.

As table 55 shows, the airport supports the manufacturers by its willingness in inter-organizational cooperation (2; 25%), and also by the provision of potential factors in the form of information, knowledge and experience (8; 100%) and rights (7; 87.5%). Additionally, the right contacts, possessing the necessary skills, expertise, knowledge and capabilities (8; 100%), and also provides the appropriate access (8; 100%). Oliver (1997: 707) states that at the same time the airport ensures that the manufacturer has access to specific potential factors that are not available in this form on the market. With the provision of these potential factors in the early phase of the project the airport (Kale et al., 2000: 224) shows its willingness for integration by means of an optimal combination of potential factors to create specific achievement bundles as the basis for relational rents (Duschek, 2004: 63).

Dyer and Singh (1998: 667) state that the greater the synergy potential of the potential factors, the greater the potential for both of the partners to achieve relational rents. As shown in Subchapter 10.5.1.1. This is due to the homogeneity of the achievements ex-ante to the award decision, and to the possibilities of manufacturers to differentiate on technical features from the limited competition, so that differentiation opportunities can only be made on intangible assets. This becomes even more apparent from the success factors mentioned by the airport experts and summarized Table 57. From the perspective of the airport a manufacturer is successfully in competition if it offers an optimum solution / achievement for the airport and integrates the airport into the solution finding and development (8; 100%), and also when a good relationship with the manufacturer exists based on positive experiences (8; 100%). On this basis the airport is able to unofficially favor a manufacturer (6; 75%).

These intangible relational based assets are supplemented by the representation of competence in the context of the developing solution, but they also work with LU´s in the industry (4; 50%), so that a combination of all the risk

[563] Cf. Subchapters 7.3.1 (Fig. 10) and 7.3.2 (Fig. 11).

factors of the airport, the project can be minimized through the optimized use of intangible factors (3; 37.5%). Strong relationship management combined with low risk and positive references (3; 37.5%) allow the airport to view other assessment criteria as secondary (1; 12.5%), in which the obligation to choose the most economic offer has still to be applied (7; 87.5%).

Efficiency here means not necessarily accepting the lowest offer, because the efficiency argument can be influenced by subjective evaluations (e.g. the value of trust or relationship).[564] As illustrated in Table 58, the customer is even willing to accept a higher price if he had been involved in the problem-solving solution, and therefore is convinced of the solution (8; 100%) and can better estimate the risks, strengths and weaknesses associated with that preferred solution (6; 75%), and can evaluate it better (1; 12.5%). On this basis the customer is able to defend the development of integrated problem solving both internally and externally, providing a CA based on preferential intangible relational assets.

10.5.2.2 Competitive advantage by inter-firm network

Whether a manufacturer can achieve CA depends on whether the airport is able to reward potential factors so that he can take advantage of their integration. Duschek (2004: 61) states that it is essential to compensate for a lack of airport resources and to combine them with one or more manufacturers, so that an optimal achievement results as a solution to the customer´s problem and the development of inter-organizational CAs can be anticipated.

The analysis of customer responses revealed that a synergistic combination of strategically relevant network resources occurs in several phases of CI between the actors. As Table 60 shows, the major share of the achievement contribution of the airport is related to the early phase[565], which means in advance of the

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[564] See Subchapter 10.4.2.2 (Tab. 58, price is not the single criteria, value: 8; 100%; evaluation of economic criteria can be subjectively influenced, value: 2; 25%). Weber (2015) defines the term economy as an expression for meeting the principles of economy and states that a) absolute economy expresses the result of an activity related to the necessary input of resources and b) relative economy presents the relation to the absolute economy of an alternative result.

[565] Cf. Subchapter 10.4.2.3 (Tab. 62).

tendering of a baggage handling project. Here achievement contributions have been identified in the planning (8; 100%), in the creation of the concept (8; 100%) and in the common solution development, which is based on airport-specific knowledge and experience (6; 75%).

According to Table 55 the airport supports the manufacturer primarily by the availability of suitable potential factors, e.g. human resources (8; 100%), the opening of suitable access for the parties on customer side (8; 100%) as well as through the exchange of information, experience, knowledge (8; 100%) and the granting of rights[566] (7; 87.5%). Without this support an achievement provision or inter-organizational cooperation between the manufacturer and the airport would not be possible (2; 25%).

Through utilization of the network and from the perspective of the airport experts, potential common solutions were already developed in discussions in advance of the tendering process and the existing technical solutions adapted to the customer's problem.[567] There it is intended by the airport to equalize the manufacturer's information deficit.[568] The remuneration for the transfer of airport-specific potential factors can be equated with the expectations of the airport related to integration benefits. Table 59 illustrates that the expectations of the airport in terms of advantages are mainly related to information, transparency and risk anticipation during the project (8; 100%).

In addition, the possibility of investing their own ideas and concepts (8; 100%), the knowledge of the commonly developed problem-solving solution (8; 100%), linked to the knowledge that this solution takes the specific situation of the airport into consideration (8; 100%), and the chance of enforcement of airport-specific manufacturer preferences, coupled with a maximum degree of solution certainty (8; 100%) all represent additional anticipated advantages. The development of customer knowledge and skills (7; 87.5%), e.g. concerning the cost

[566] The airport supports the manufacturer with e.g. access rights in order to be able to assess the proposed implementation area.

[567] Cf. Subchapter 10.4.2.3 (Tab. 61, value: 8; 100%).

[568] Cf. Subchapter 10.4.2.3 (Tab. 62, value: 1; 12.5%).

structure of the manufacturer in order to be able to review the offered prices[569] (2; 25%), associated with increasing independence from the manufacturer (7; 87.5%) and the improvement of their reputation within the industry (4; 50%) are additional expectations of the airport related to airport-specific potential factors and their integrative combination in order to create optimized achievement bundles.

This explanation shows that the expected benefits from the airport from the integration of its achievement contributions are of an essentially intangible nature and based on relational factors. The resulting advantage for the airport is based on inter-organizational network relationships, which result in advantages for the airport and also in relational rents (Dyer and Singh, 1998: 662; Duschek 2004: 62). Also in the ex-post project phases, contributions are also possible from the perspective of the airport,[570] but here limitations need to be considered due to the different degree of specialization between manufacturer and customer.

After the creation of the system concept and its publication, the provision of integrative achievement contributions of the integration partner after the award decision or ex-post becomes relevant [571] From the customer's perspective the preliminary phase of the project and the successful combination of synergistic relational potential factors on the basis of inter-organizational network collaboration is, for both the manufacturer as well as for the customer, a crucial stage in the context of the achievement creation[572]. In this phase the cornerstone of the subsequent achievement provision is established and based on the successful combination of potential factors and their integrated combination to achievement bundles and creates the basis for achieving a CA.

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[569] Cf. Subchapter 10.5.1.2 about the forced opportunistic behavior of the customer.

[570] Cf. Subchapter 10.4.2.3 (Tab. 61, values: 2; 25%; Tab. 62, project management, value: 3; 37.5%; achievement in the execution phase of the project, value: 2; 25%)

[571] Cf. Subchapter 10.4.2.2 (Tab. 56, value: 6; 75%) and Subchapter 10.4.2.3 (Tab. 61, integration during tender and negotiation process is impossible, value: 7; 87.5%).

[572] Cf. Subchapter 10.4.2.3 (Tab. 61, values: 8; 100%).

10.5.2.3 Relationship as a key factor for competitive advantage

Table 68 shows that using specific potential factors can contribute significantly to building a relationship with the manufacturer. These include communication (8; 100%), the compliance of commitments (8; 100%), and building a basis of trust with the manufacturer (100% 8) are all of crucial importance (Morgan and Hunt, 1994: 20). Wecht (2006: 23) and Litter and Leverick (1995: 16-17) confirm the importance of communication in the formation of trust between the actors for the development of inter-organizational relationship management. Significant contributions towards building a relationship with the manufacturer help the airport with a common development of approaches to the solution of the airport´s specific problem (8; 100%), while integrating its own solutions (8; 100%) and ideas. This allows the manufacturer the combination of external and internal potential factors for specific achievement bundles and works within this in a goal-oriented team that agrees to the success of the project as a common goal (2; 25%). This confirms the airport in his commitment, supports its involvement (8; 100%) and acknowledges the airport-specific experience and expertise (2; 25%) of the customer. The combination of relational variables (2; 25%) between the manufacturer and the customer provides the airport with an inter-organizational relationship with the manufacturer, and with opportunity-based relationship variables as the fundamental basis, enabling both integration partners to work closely together and to focus and combine their potential factors in a synergistic manner to the advantage of both partners. Frey (1991: 46) states that if this relationship - based on relationship variables with the manufacturer - is of such a high quality that the airport sets preferences on this basis so that additional characteristics fade into background, then the relationship between the actors represents the crucial success factor for the integration of the customer.[573] According to Duschek (2004: 62), the relationship between the two integration partners differs from the usual customer and supplier relationships and supports the formation of inter-organizational quasi-rents, which occur in the form of relational rents (Dyer and Singh, 1998: 661-662).

[573] Cf. Subchapter 10.4.1.2 (Tab. 41, preference, value: 16; 94.12%; other criteria than relationship are secondary, value: 14; 82.35%)

As Table 67 shows, this supports the trusting relationship between the integration partners, helping the airport to reduce the risk of incorrect assignments (8; 100%). takes It also provides advantages by dealing with project inconsistencies (8; 100%) and anticipates this in the implementation of the project (7; 87.5%). This can have a positive effect on the project cost for both of the integration partners. The quality of the relationship between the airport and the manufacturer decisively influences the project's success (3; 37.5%), as well as the cooperation, combining potential factors into specific unique and valuable indivisible achievement bundles (Dyer and Singh, 1998: 673). The effects of a strong relationship based on relational variables promises the airport a price advantage (8; 100%) below the price of a manufacturer having a weaker relationship with the customer, or with less optimal combinations of external and internal potential factors. The basis for the expectations of the airport is the relationship of trust to the manufacturer and the cooperation and detailed knowledge of the commonly developed solution. On the other hand, the manufacturer is trying to achieve a higher price[574] using the same argument, because with increasing integration the involvement of the customer acts as an exit barrier concerning the relationship, and thus counteracts a possible loss of investment from the customer in a combination of factors with the preferred manufacturer.

In order to escape this dilemma the airport can follow the procurement principles[575] and behave obligatory highly opportunistically until the conclusion of the contract. However, since the relationship of the integration partner is based on a combination of idiosyncratic relational factors, this places the relationship management in a crucial role concerning CI and subjectively influences the assessment for deciding on the appropriate tenderer.[576] Therefore, under the terms of product homogeneity, this occurs by the influence of the relationship management, resulting in a CA for the preferred manufacturer.

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[574] Cf. Subchapter 10.4.2.4 (Tab. 67, value: 2; 25%).

[575] Cf. Subchapter 8.6.4, §97 (1) GWB and §97 (2) GWB.

[576] Cf. Subchapter 8.6.7 (Fig. 35; Fig. 36).

10.5.2.4 Process orientation

As Tables 60 to 64 show, it is from the perspective of the airport that an introduction to the different stages of a baggage handling project in the context of achievement contributions is imaginable.[577] For example Table 60 shows the main focus of the airport, especially on the preliminary phase of the project (8; 100%) in advance of the invitation to tender.[578] Here the airport concentrates its expertise on the introduction of achievement contributions mainly of the planning process (8; 100%), in which the concept development (8; 100%) of a BHS is carried out and in which can be integrated customized experience, knowledge and know-how (6; 75%). as All these are potential factors that can be combined to those of the manufacturer. In this case for example the airport initiates a preliminary systematic selection of approved project participants in advance of the invitation of tender (1; 12.5%)[579], and the combination of value chain partners[580] is crucial because it determines the synergistic combination of potential factors and the resulting achievement contribution bundles at a later stage, generating inter-organizational resource-based CAs (Duschek, 2004: 61) or "(...) above normal profits or inter-organizational quasi-rents (...)" (Duschek, 2004: 62).

By concentrating on the introduction of potential factors in the preliminary phase of the baggage handling project and the targeted selection of possible performance partners, the airport is in a position to form early inter-firm resource relations, which lower the transaction costs and lead to the generation of relational rents for the airport and the manufacturer (Dyer and Sing, 1998: 662; Duschek 2004: 62). This also sets the pre-phase of the project to the decisive phase for the generation of CAs during the integration of the project.[581] As already mentioned the progress of the project makes further achievement contributions of the airport conceivable. The airport is capable of taking on tasks such as project

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[577] Cf. Subchapter 10.4.2.3 (Tab. 60, value: 1; 12.5%; Tab. 61, value: 8; 100%).

[578] Cf. Subchapter 10.4.2.3 (Tab. 61, preliminary phase (crucial project phase), value: 8; 100%).

[579] Cf. Subchapter 10.4.2.3 (Tab. 62, value: 8; 100%).

[580] Cf. Subchapter 10.4.2.3 (Tab. 62, value: 8; 100%).

[581] Cf. Subchapter 10.4.2.3 (Tab. 61, value: 8; 100%).

control, project management and coordination[582], ensuring that the interface management[583] provides targeted achievements[584] for the manufacturer. The airport is particularly suitable for these tasks because it has unique internal access to peripheral areas relating to the project. At the same time it is able to use its influence as a customer of the external project partners to exert pressure to support a low-friction course, and therefore to reduce the airport´s ex-post transaction costs.

Due to the share of knowledge and the involvement of the partners in the integration project (Dyer and Singh, 1998: 668), it is conceivable, even after completion of the project, that the airport in negotiated service contracts takes on maintenance tasks for and on behalf of the manufacturer, and therefore uses its "absorptive capacity" (Dyer and Singh, 1998: 665) in the integration of the project a degree of targeted cumulated knowledge, and is therefore able to integrate additional airport-related achievement contributions in order to gain some advantages (Cohen and Levinthal, 1990: 128).

Concerning the willingness to exchange manufacturer-specific knowledge in collaboration achieves for the manufacturer a relational-based CA compared to those who are not willing or able to do so, while the airport can generate an economic advantage by increasing its value share.

10.5.2.5 Targeted use of resources

To prevent a waste of resources it is necessary to use them purposefully so that optimal combinations result in the project. Therefore the involvement of the customer in the project is crucial for the achievement result.[585] Just as with the manufacturer, the airports also focus on the early phase of a baggage handling project. Using potential factors, they pursue the airport's goal in order to minimize their project risks by achieving budget security and system

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[582] Cf. Subchapter 10.4.2.3 (Tab. 62, value: 3; 37.5%).

[583] Cf. Subchapter 10.4.2.3 (Tab. 60, value: 2; 25%).

[584] Cf. Subchapter 10.4.2.3 (Tab. 64, supporting achievements, value: 6; 75%; support in execution, value: 3; 37.5%).

[585] Cf. Subchapter 10.4.2.3 (Tab. 63, value: 7; 87.5%).

performance[586] by early selection of the appropriate manufacturer regarding the possible combinations of their potential factors with those of the airport.[587]

As Table 63 shows, it is the customer who initiates the crucial impulse for the provision of achievements (4; 50%) by targeted information about the project and compensate information deficits (2; 25%) of the manufacturer[588] (Zernott, 2004: 62). If these information deficits are compensated for airport-specific and manufacturer-specific potential factors, then they can be evaluated and, if necessary, combined with each other, so that an optimum achievement bundle results. Thus the involvement of the customer is generally necessary for the subsequent achievement results (7; 87.5%) and is even a mandatory requirement for the integration of system components, for example, into existing BHS (1; 12.5%).

As Table 64 illustrates, the involvement of the customer is due to the customized request of BHS being indispensable, because only the customer is able to describe his specific problem (8; 100%) and can stimulate the manufacturer to make appropriate problem-solving resources available. Therefore Duschek (2004: 62) states that an early cooperative collaboration between producers and airport will specify the required achievements and offer the possibility of generating idiosyncratic combinations of potential factors to be used as the basis of the tender documents in a commonly developed system concept (7; 87.5%). If the achievement contributions of the customer cannot be integrated in an appropriate manner, this can cause a suboptimal combination of potential factors and achievement bundles which not optimally suit to to solve the customer´s problem, and the provision of services will be placed in danger (8; 100%). Thus the investments made by manufacturer and the airport in external and internal potential factors would also be endangered. While the manufacturer at a moderate level of integration degree[589] ex-post of the award decision needs

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[586] Cf. Subchapter 10.4.2.3 (Tab. 64, value: 7; 87.5%).

[587] Cf. Subchapter 10.4.2.3 (Tab. 62, value: 8; 100%).

[588] Cf. Zernott (2004: 62) about using customer´s knowledge and information.

[589] Cf. Subchapter 7.2.2 (Tab. 13).

targeted supporting achievements[590] from the airport in order to execute the project, the concentration on the customer's side shows the realization of the achievement and the high integration degree[591] related to the ex-ante phase prior to the award. The customer then makes possible an investment of the provision of internal and external potential factors early in the project. This ensures that their own resources can be implemented in an optimal and efficient way.

10.5.2.6 Early acquisition of information and knowledge

In addition to the illustration in Subchapter 10.5.1.6, it is also in the interests of the customer to place knowledge processes as early as possible and to be able to use the gained knowledge over the entire course of the project (Wildemann, 1993: 27-28). This is shown in Table 61. The airport is interested very early in the project and prior to the public notice (pre-phase of the project[592]) to (pre-) discuss the task with the preferred manufacturers (8; 100%), and possibly to adapt existing technical solutions in a way that is suitable to solve the customer's problem (8; 100%). The airport is also faced with the dilemma of customized logistic process information, but may have only limited development and manufacturing resources (3; 37.5%), and thus the airport needs, in common work with a manufacturer or external partners, an appropriate knowledge transfer (Dyer and Nobeoka, 2000: 364) and the implementation of knowledge sharing routines (Dyer and Singh: 1998, 664).

Thus the airport is interested to make an early internal selection of suitable partners to participate in the project (8; 100%), as well as to combine the potential factors of suitable partners in a way that the combination of single factors, as well as the accumulation of the individual factors in the context of inter-organizational collaboration (8; 100%), promises to solve the customer's problem.[593] Dyer and Singh (1998: 665) state that the sooner the airport and its preferred partner are able to establish and use inter-firm knowledge-sharing routines efficiently, the

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[590] Cf. Subchapter 10.4.2.3 (Tab. 64, value: 6; 75%; manufacturer forcibly dependent on airport´s contribution, value: 6; 75%).

[591] Cf. Subchapter 7.2.2 (Tab.13).

[592] Cf. Subchapter 10.4.2.3 (Tab. 61, value: 8; 100%).

[593] Cf. Subchapter 7.2.1 (Fig. 9).

more probable it is that the actors can assess the individual potential factors of the project partners and combine them into optimal achievement bundles. From this is follows that the sooner they can use it in a system concept and, during the course of the project, profit from the inter-firm specific relational asset based knowledge[594] and generate CAs and relational rents at an early stage.

10.5.2.7 Increase of deterministic process shares

Complementary to Subchapter 10.5.1.7 and Subchapter 10.5.1.8, it can be seen that on the basis of the airport requirements for a customized BHS, the implementation of these requirements in a system specification that is part of the tender documents, and in addition to the BoM, will be the basis for quoting by the manufacturer.[595] Thus, the definition of the technical conditions[596] is made in the preliminary phase of a project and not during the limited period of the invitation to tender. In addition, the airport is bound during the invitation to tender to principles that prevent it from making any fundamental changes of the tender conditions. This increases the requirements on the manufacturer and the airport and forces them to a high degree of activity, especially during the period prior to the invitation to tender.

Tables 59 to 62 show that the airport follows the intention of trying to implement its own achievement contributions very early in the process and to take an active role in the development and control of problem-solving,[597] thereby to achieving a high involvement and a high degree of integration.[598]

Seidel (1996: 45-46) states that in this case it offers the airport the chance to describe and define as many achievement contributions as possible between the process partners. In this way the airport and its project partners achieve clarity concerning the individual achievement contributions and their combination to

[594] Cf. Subchapter 5.3.2.

[595] Cf. Subchapter 10.4.2.3 (Tab. 63, value: 2; 25%).

[596] Cf. in detail Subchapter 8.5 to 8.5.2.5.

[597] Cf. Subchapter 10.4.2.3 (Tab. 59, values: 8; 100% and 3; 37.5%; Tab. 60, pre-phase, value: 8; 100%; synergetic partner selection, value: 2; 12.5%; Tab. 61, values: 7; 87.5%; 8; 100%, Tab. 62, values: 4; 50%-8; 100%).

[598] Cf. in detail Subchapter 7.2.2 (Tab. 13).

achievement bundles in the project (Fließ, 1996: 92-93), as well as gaining visibility (Zernott 2004: 70) and reducing their project-specific risks by reducing uncertainty and lack of information.[599]

Without using this possibility there remain risks that can lead to friction losses between the integration partners, and to an inefficient combination of achievement bundles. This may badly affect the achievement result and in consequence the operational core competences of the airport (baggage handling logistics). Fließ (1996, 62) states that if this process runs positively and the project partners succeed in reducing uncertainties and risks or eliminating these things completely, then the manufacturer achieves a CA. While the airport can already ensure the course of the project[600] and is able to avoid bottlenecks[601] in the integration project, decreasing the airport´s project-specific transaction costs achieves a relational rent based on inter-organizational collaboration.

10.5.2.8 Increase of process awareness

Based on the statements made in Subchapters 10.5.1.8 and 10.5.2.7 the elimination of project risks is essential for the airport to secure the integration project and a substantial requirement of a CI-project.

Table 59 presents the main expectations of the airport experts regarding risks. Reactions should be initiated as soon as possible in order to ensure the project operations (8; 100%). The role of the customer is to adapt to all phases of the project (3; 37.5%) and to integrate the achievement contributions of the airport into its various phases. [602] Table 64 shows that under the precondition of a non-optimal integration of the achievement, the contributions of the customer to the overall achievement could be suboptimal or endangered (8; 100%). The exclusion of uncertainty necessitates the customer to be in the position of identifying risk factors and responding to them. The customer counters this requirement to invest

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[599] Cf. Subchapter 10.4.2.3 (Tab. 59, value: 3; 37.5%; Tab. 62, value: 1; 12.5%; Tab. 63, value: 2; 25%).

[600] Cf. Subchapter 10.4.2.3 (Tab. 59, speedy anticipation and reactions related to risks, value: 8; 100%; value: 3; 37.5%).

[601] Cf. Subchapter 10.4.2.3 (Tab. 59, value: 8; 100%).

[602] Cf. Subchapter 10.4.2.3 (Tab. 60, value: 1; 12.5%).

a substantial share of integration possibilities into the preliminary phase of a BHS-project. Table 61 provides the information about the integration point in time of the customer and shows that the preliminary project phase is crucial for integrated achievement contributions (8; 100%). In addition, integration in the tendering phase, especially ex-ante to the award, is almost impossible (7; 87.5%). Therefore the sooner the airport is in a position to select and combine potential manufacturers, suitable for participation in the project, the sooner can airport (8; 100%) build an inter-organizational relationship with the manufacturers[603]. Likewise, the sooner the airport is able to assess the potential factors of the producers and to examine its own potential factors in order to achieve optimum combination possibilities, the better (Fließ, 1996: 94).[604]

In the course of cooperation, and with increasing information and knowledge value, the project-specific uncertainty of the airport is reduced until the setting of manufacturer preferences,[605] based on cumulative knowledge and trust in the capabilities of the integration partners. In advance of the invitation to tender preferences are made based on an inter-organizational synergetic combination of potential factors to project-specific achievement bundles representing essential integration partners and relational based CAs that leads to the generation of relational rents (Dyer and Singh, 1998: 662, Duschek 2004: 62).

10.5.2.9 Integrativity

Table 64 shows that as well as the manufacturer (cf. Table 40) the airports are also interested in collaboration with the manufacturer, both in advance of the schedule (7; 87.5%) as well as in the implementation ex-post to the award (6; 75%). This general willingness of the customer supports the development of an integrated achievement relationship with the manufacturer (Zernott, 2004: 72) and motivates the actors to work in a cooperative manner (Engelhardt and Freiling, 1995: 37). The airport imposes certain requirements on potential manufacturers as co-integration partners.

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[603] Cf. Tab. 64 (value: 7; 87.5%)

[604] Cf. Subchapter 7.2.1 and Fig. 9.

[605] Cf. Tab. 60 (value: 1; 12.5%)

Table 65 presents the main manufacturer-specific factors for suitability as integration partners. In addition to understanding the project specific needs and requirements (8; 100%) there is also the presence of corresponding professional competence (8; 100%), the relevant skills (8; 100%), as well as clarity in the contacts and interfaces (8; 100%). There are also preconditions that have to be fulfilled. With the requirement of appropriate access to the contact persons relevant for the success of the project (7; 87.5%) the airport tries to ensure on the manufacturer side that an exchange of information between value chain partners can occur (5; 87.5%).

The underlying reason for this is the request for cooperation from all parties and the identification of the success of the project as a common goal (4; 50%). Therefore, one of the basic requirements is the general willingness for project-specific cooperation, but without the certainty[606] of the expectation ex-ante of the award decision or a repayment of the manufacturer-specific investments (2; 25%). Professionalism, cooperative behavior and a by own initiative motivated exposure of achievement limits by the manufacturer (2; 25%) should help the airport to anticipate uncertainty and project risks early and to protect themselves against investment losses related to the use of their own potential factors.

Therefore the airport has a vested interest in building a relationship with manufacturers based on intangible relational factors (8; 100%) and the establishment of a network of relationships (6; 75%), which could provide it with insight into the value creation process of the manufacturer (1; 12.5%). If the airport is able to implement the above requirements of the project in the context of an integrated partnership, it achieves a quasi-rent based on inter-firm relational factors, resulting from the reduction of transaction costs that provides the airport with a cost advantage in the project.

10.6 COMPARISON OF THE EXPERT GROUPS I AND II

Subchapter 10.6 compares the expert groups I and II and considers the similarities and differences according to the key factors of CI in Subchapters

[606] For example: Letter of Intent or a promise to order.

10.6.1 (ex-ante to the decision), 10.6.2 (point of decision)[607] and 10.6.3 (ex-post of the decision). Therefore Subchapter 10.6 will be the basis for the summarization following Subchapter 10.7. In the analysis and interpretation of expert groups 1 and 2, various similarities between both expert groups have been identified. The evaluation of Tables 57 and 65 of expert group II is on the importance of tangible and intangible factors on the customer side. Table 70 compares these with the evaluation of the manufacturer's side illustrated in Table 69.

This also presents the customer with intangible factors (96), which determine whether a manufacturer can differentiate itself from the competition under the conditions of product homogeneity in this specific market.[608] There are from a customers' perspective the priorities in inter-organizational (43) and relational factors (34), while product related tangible factors (9) are of less importance, and in the background they are important only as differentiation factors. For the manufacturer and for the customer there are intangible assets based on inter-organizational collaboration, relationships, human specific assets, and knowledge and information, which is the basis for the manufacturer of a BHS to achieve a CA and relational rents (Duschek, 2004: 62).

[607] Cf. Subchapter 10.1.5.4.

[608] Cf. Subchapter 10.5.2.1.

TABLE 70: Comparison of tangible and intangible achievement potential factor frequency

Differentiation factor	Manufacturer		Customer	
	Tangible factor frequency	Intangible factor frequency	Tangible factor frequency	Intangible factor frequency
Relationship related	-	50	-	34
Human specific	-	33	-	3
Inter-organizational related	3	38	-	43
Product related	10	-	9	-
Information / knowledge related	-	27	-	16
Total	**13**	**158**	**9**	**96**

The differences within the field of human specific factors are conspicuous. This can be attributed to the fact that from the perspective of the customer the manufacturer has to prove its suitability in the award procedure for the granting of access, as well as to participate in the tender procedure (§§20 (2), 21, 23, 24 SektVO; §97 (4) GWB).[609] Thus the airport ensures that the procedure system involving manufacturers meets the necessary conditions of professional competence and that fully capable and qualified staff achieve the expected solution of the required task.

[609] Cf. Subchapter 8.6.4 and Fig. 34a.

In advance of the announcement this is based on a leap of faith towards the manufacturer. In contrast, on the manufacturing side the situation is different. Due to the few available projects on the market coupled with strong competition[610] (Table 33), the manufacturer is forced from the beginning to deploy success promising potential factors to help them prevail in competition.

Table 69 also shows that product related tangible factors (e.g. reference projects based product related differentiation) cannot be neglected, as they contribute significantly to opening the customer to the manufacturer and to assessing the suitability. Therefore they contribute to the differentiation of the manufacturer from the competition (9) as well as for the manufacturer (10) in advance of the project, but take in the overall consideration a more subordinated role.

The recent evaluations show that the activities of the manufacturers to achieve a CA relate to the phase prior to the award of contract and focus on the period in which no manufacturers are yet nominated for participation in the tender procedure. In order to operate in a system-compliant way within the legal framework, the airports focus their activities on this phase, as they need to be compliant with the legally prescribed procedures (GWB, SektVO) during an ongoing procurement.

That means that the manufacturer and the customer use missing system requirements in the early ex-ante phase of the decision phase prior to the beginning of procurement in order to behave compliantly within the system during the official procedure.

Therefore the focus is set on the ex-ante phase of the decision and ex-post of the decision in terms of relevant similarities and differences between the expert groups. For completeness, the point of decision is briefly addressed as a separate process step.

10.6.1 Ex-ante to the decision

Comparing expert groups 1 and 2 in the phase ex-ante to the decision, the result is depicted in Tables 71 to 78. As a reference dimension for comparing the

[610] Cf. Subchapter 10.4.1.1.

key factors of the CI were selected. The tables present in a matrix the key factors for redundancies adjusted for interpretation I of the manufacturers (M_a/M_b), and the requirements or expectations towards the customer (M_a/C_b), as well as the information provided by the customer (C_a/C_b) and their requirements on the integration with the manufacturer (C_a/M_b).[611] The indices (a) and (b) were set in order to realize the distinction of the different perspectives between M and C.

Inter-firm network (Table 71): The comparison between M_a/M_b and C_a/C_b shows, in addition to the commitment to cooperation between manufacturer and customer, the combining of the available potential factors in a way that individual deficits are compensated. Both firms share information with each other and influence a commonly developed solution of the customer´s problem. While the manufacturer receives a temporal and informative CA, the airport focuses on the development of manufacturer preferences, and of sharing common experiences and skills in order to reduce its risk.

Considering the expectations from the other partner highlights the comparison between M_a/C_b and C_a/M_b so that the manufacturer expects achievement contributions from the customer on the basis of a contract between the company network in the form of planning tasks for the development of specifications and concepts in the selection of value added partners that compensate for the deficits of potential factors and the preselection of approved competitors for participation in the invitation to tender. This coincides with the expectation of the customer, who sees the introduction of potential factors, equalizing factor deficits and the willingness for a common solution development.

[611] The respective underlying base tables have been included in Appendix 2.

TABLE 71: Inter-firm network related comparison of manufacturer and customer factors ex-ante to the decision

Factor	Related to	M_a	C_a
Inter-firm network	M_b	- Combination of potential factors - Equalization of factor deficits - Support to customer - Sharing information - Influence on solution finding - Time / information advantage	- Input of potential factors - Common customized solution development - Equalization of factor deficits
	C_b	- Selection, arrangement, combination of value chain partners, - Pre-selection of competitors - Planning, development of specifications / concepts	- Combination of potential factors - Building preferences - Risk reduction - Willingness to collaborate / to become integrated - Equalization of factor deficits - Planning, experience based concept development

Relationship (Table 72): The comparison between M_a/M_b and C_a/C_b shows that the establishment of a bilateral relationship on the basis of relationship variables (e.g. mutual trust) is possible between the manufacturer and the customer. Success barriers can be reduced or broken down by a synergistic combination of potential factors that also reduce the risk of project failure.

CAs are achieved by the manufacturer through increased sales activities, by information and time advantages and by the knowledge of factor deficits on the customer side, while the airport itself promises an increase in efficiency and a reduction of the total costs of the project. There are major differences in the manufacturer's intention to obtain a higher price based on relationship (e.g. trust as a variable), while on customer's side the contrary intention prevails. The comparison between Ma/Cb with Ca/Mb shows that the main expectations from manufacturer's side are the use of suitable employees by the customer, access considerations, as well as placing preferences in favor of the manufacturer. On the other hand the manufacturer expects the integration of their ideas and

suggestions towards solving the problem, and a willingness to reduce the project risks and to increase efficiency.

TABLE 72: Relationship related comparison of manufacturer and customer factors ex-ante to the decision

Key factor	Related to	M_a	C_a
Relationship	M_b	- Overcoming success barriers - building customer relationship - Improvement of sales activities - Information about factor deficits on customer side - Information / time advantage - Risk reduction - Building trust - Higher price	- Building relationship - Integration of customer ideas - Risk reduction - Common goal - Increase of efficiency - Potential factor synergies - Lower price
	C_b	- Use of relational variables - Willingness to support - Use of skilled people - Access - Setting preferences	- Building trust - Common development - Synergetic use of potential factors - Integration of customer ideas - Risk reduction - Increase of efficiency - Lower total project costs

Process orientation (Table 73): As expected the comparison of M_a/M_b between C_a/C_b shows more differences than similarities between the manufacturer and customer. The manufacturer seeks by increased sales activities through information and relationship variables to identify and equalize deficits in potential factors in order to achieve unique achievement bundles and by this means to create or increase mobility barriers. The airport at this stage already tries to integrate into the different phases of the project and uses its customer-specific intangible factors (e.g. information, knowledge).

TABLE 73: Process orientation related comparison of manufacturer and customer factors ex-ante to the decision

Key factor	Related to	M_a	C_a
Process orientation	M_b	- Use of relational variables - Collaboration - Information - Equalization of factor deficits - Crafting achievement bundles - Improvement of sales activities - Increase of mobility barriers	- Integration of customer achievements - Building inter-firm resource relations - Combination of potential factors / achievement bundles
	C_b	- Selection, arrangement, combination of value chain partners - Competitor selection - Specification, basic concept - Co-development of solution - Identification with the solution - Setting preferences	- Integration in several project phases - Planning, concept development - Use of customer specific intangible factors - Selection, arrangement, combination of value chain partners - Building inter-firm resource factor relations - Lowering transaction costs

Planning and concept development sees the airport as one of its core tasks, in which it tries to use, by selection, arrangement and combination of value chain partners, inter-firm resource factor relations in a process-oriented way so that transaction costs are reduced. The points mentioned are commensurate with the expectations of the manufacturer (M_a/C_b), who expects the factor of identification to help with the solution and the setting of preferences by the airport.

Targeted use of resources (Table 74): The comparison between M_a/M_b and C_a/C_b suggests that manufacturers and the airport are committed to the targeted use of resources to minimize project risks in order to ensure compliance with the budget and to protect their own investments.

TABLE 74: Targeted use of resources related comparison of manufacturer and customer factors ex-ante to the decision

Factor	Related to	M_a	C_a
Targeted use of resources	M_b	- Information - Intensification of technical sales - Risk reduction - Saving investments - Combination of potential factors - Common development with customer - Optimized solution as system specification - Exit barrier for customer - Use of relational factors - Definition of interfaces and escalation procedure - Customer involvement - Building relationship	- Idiosyncratic combination of potential factors - Common development of the system concept as a basis for the procurement - Optimal combination of potential factors / achievement bundles
	C_b	- Customer involvement - Integration of customer´s competences - Project planning - Project management	- Risk reduction - Budgeting safety - Ensuring system performance - Achievement impulse - Equalization of manufacturer´s information deficits - Selection of potential manufacturers - Combination of potential factors

In the course of this the manufacturer tries to develop an optimal solution of the problem together with the airport, which serves as a system specifier in the tender documents. This involves the customer through the application of relational factors in a way that effective exit barriers can be created against a way

for the customer from the relationship. For formal assurance guidance elements are installed, such as defined interfaces and escalation steps.

The manufacturer and the customer try to optimize the use of potential factors, in which the customer influences the achievement result (e.g. system performance) through the selection of possible value partners, and is willing to be integrated into active cooperation with the manufacturer. This is the crucial impulse towards achievement (e.g. system specification, concept, etc.). The customer´s expectations towards the manufacturer (C_a/M_b) are generally an optimal idiosyncratic combination of potential factors for crafting achievement bundles, as well as a common development of the system concept ready for the procurement procedure. In general this is similar to the manufacturer (M_a/C_b), who expects strong involvement from the customer, who is willing to integrate his competences, especially in project planning and project management.

Early acquisition of information and knowledge (Table 75): The comparison of between M_a/M_b and C_a/C_b represents significant differences between the manufacturer and the airport. While the airport relies on early acquisition of knowledge prior to the project announcement through a dialogue with selected manufacturers, making use of knowledge sharing routines and controlled knowledge transfer in order to apply their knowledge over the entire project phases, the manufacturers strive to build trust-based partnerships at the earliest opportunity with relevant customer points of contact to achieve early access to the project.

By a unique combination of potential factors, building trust and early access to the manufacturer, they get information and time related CAs that result in an exit barrier for the customer and stress-related opportunistic behavior. The manufacturer expects the customer (M_a/C_b) to be open and integrated, and the potential for the optimization of the combination of all potential factors connected with a certain absorptive capacity, followed by internal and external protection (also price related) of the common solution via setting preferences. This in general is different from the expectation of the customers (C_a/M_b). In addition to the sharing of knowledge with the customer there is an expectation of a solution through the accumulation of potential factors evaluated at an early stage and their ability to create a useful achievement bundle.

TABLE 75: Early acquisition of information and knowledge related comparison of manufacturer and customer factors ex-ante to the decision

Key factor	Related to	M_a	C_a
Early acquisition of information and knowledge	M_b	- Building relationship / partnership with customer - Access to relevant people - Information - Building trust - Equalization of potential factor deficits - Unique factor combination - Project entry - Customer consulting - Time / information advantage - Reduction of opportunistic behavior - Exit barrier for customer	- Accumulation of potential factors for promising a solution that solves the customer´s problem - Knowledge sharing - Evaluation of potential factors / achievement bundles
	C_b	- Open for integration - Potential for optimized factor combination - Absorptive capacity - Useful problem solution - Acceptance of price level - Preferences - Internal / external protection of common solution	- Application of cognititve knowledge for all phases of the project - Discussion with potential preselected manufacturers before announcement of the project - customized adaptation of existing technical solutions - Knowledge transfer - knowledge sharing routines

Increase of deterministic process shares (Table 76): The comparison of M_a/M_b with C_a/C_b shows the manufacturer's intention to overcome success barriers by the optimization of potential factors. This includes a complete and valid description of the achievement, agreed upon project goals as well as partner specific partial achievements. This is similar to the intention of the customer (C_a/C_b), who is interested in project transparency and the integration of their requirements into the system specification. By active development and control of

the solution the customer want wishes to ensure that his project specific achievement contributions will be integrated by the manufacturer, so that his involvement tends towards a high degree of integration in order to decrease the related transaction costs by the optimization of partner specific achievement contributions.

The expectation of the manufacturer towards the customer (M_a/C_b) is to persuade the customer to set preferences, thus involving himself with the development of the solution.

TABLE 76: Increase of deterministic process shares related comparison of manufacturer and customer factors ex-ante to the decision

Key factor	**Related to**	**M_a**	**C_a**
Increase of deterministic process shares	M_b	- Overcoming success barriers - Optimization of potential factors - Achievement description - Complete valid information - Information and knowledge advantage - Agreed project goals - Agreed partner specific partial achievements	- Active solution development - High integration degree - Safety about required achievement contributions and bundles - Transparency - Reduction of information deficits - Process safety - Risk reduction
	C_b	- Setting preferences - Strong involvement in the solution development - Achievement description - Investment in collaboration - Agreement about project goals - Agreement about partner specific partial achievements	- Transparency - Requirements in the specification - Integration of customer specific achievement contributions - Active control and development of the solution - Project partner specific achievement contributions - High integration degree - Decrease of transaction costs

This means that there is an expectation towards the customer to collaborate and to agree at the outset of the project about the project goals and partner specific partial contributions. The customer´s expectation towards the manufacturer (C_a/M_b) relates to the active development of a solution of the problem, to transparency and to an overall risk reduction concerning the requirements of the achievement contributions and closing information deficits. Taking all into consideration, both partners achieve advantages through reduced risk, increased project safety and an information and knowledge advantage, which was one of goals of the manufacturer (M_a/M_b).

Increase of process awareness (Table 77): The comparison of M_a/M_b with C_a/C_b shows the intention of both the manufacturer and the customer for a bilateral risk reduction. The manufacturer (M_a/M_b) is interested in building unique factor combinations by the early phase of the integration of the customer in order to achieve a CA at an early stage of the project. Opposite to that the customer (C_a/C_b) is interested in ensuring the safety of the process and its integration by customer specific achievement contributions throughout all project phases where possible, and to set a preference for the benefit of both. For the manufacturer who gains a CA and for the customer to focus activities on time and cost saving. The customer expects the evaluation, selection and combination of the potential factors from the manufacturer as early as possible (C_a/M_b) in order to save time and costs. The manufacturer's expectation is concerned with (M_a/C_b) quality achievement contributions from the customer, the selection of achievement partners and support for combining potential factors in a unique way. The customer is expected to plan the project and at least support in the development of a solution (e.g. a basic system concept) that is able to solve customer´s problem.

TABLE 77: Increase of process awareness related comparison of manufacturer and customer factors ex-ante to the decision

Key sactor	Related to	M_a	C_a
Increase of process awareness	M_b	- Risk reduction - Unique factor combinations - Integration of the customer	- Early evaluation, selection and combination of potential factors
	C_b	- Quality achievement contributions - Selection of partners - Project planning, development of a specific problem solution - Development of basic system concept - Support of unique factor combinations	- Setting preferences - Risk reduction - Process safety activities throughout all project phases - Integration of achievement contributions in several project phases

Integrativity (Table 78): Related to integrativity the comparison of M_a/M_b with C_a/C_b shows that the intentions of the manufacturer and the customer is collaboration. The manufacturer (M_a/M_b) is interested in an interchange of information in order to find a solution, if possible on the basis of existing components, which also lowers the risk of failure by a combination of tested and already applied system components, which can be used as the basis for a system specification.

The manufacturer also intends to motivate the customer into collaboration by applying intangible relational factors in order to build a relationship. The customer can gain access at any time to their preferred solution and to defend this solution internally and externally based on high integration degree and intensity. By this means they build a relationship network for the manufacturer and their suppliers[612], gaining insight in the value creation process of the manufacturer.

[612] Cf. Subchapter 7.3.2 and Fig. 11.

TABLE 78: Integrativity related comparison of manufacturer and customer factors ex-ante to the decision

Key factor	Related to	M_a	C_a
Integrativity	M_b	- Cooperative collaboration - Solution based on existing system components - Motivation of the customer for collaboration - Relationship / use of intangible relational factors - Information interchange - Solution as basis for system specification	- Building a integrated achievement relationship - Understanding needs and requirements - Competence, professional and skilled people - Interfaces / contact persons for information interchange - Common goal - Identification with the project - Collaboration - Cooperative behavior - Presentation of achievement limitations
	C_b	- Achievement partnership - Access to relevant people - Skilled people with know-how and experience - Willingness to interchange information	- Access to a preferred solution - Cooperative collaboration - Ability to defend solution internally and externally by high degree of integration - Highest integration intensity - Risk reduction - Building relationship / network - Insight into added value processes of the manufacturer

The expectation of the manufacturer (M_a/C_b) is that the customer shows willingness to cooperate by making available skilled professional people in order to build an achievement partnership. This is similar to the customer's side (Ca/Ma), which expects from the manufacturer the an integrated relationship in order to understand the needs and requirements of customer by the involvement of competent, professional and cooperative skilled people who follow a common goal and identify with the fully supported and defined project.

10.6.2 Point of decision

After negotiations with one or more of the manufacturers the customer makes a final decision about the project award, exactly point in time between the ex-ante and the ex-post phase. Basis for this is usually the internal evaluation of the manufacturer´s offer, which will be assessed on the basis of defined customer´s criteria. In the course of the procurement process (Subchapter 8.6.4; figures 35 and 36) the essential criteria will already have been addressed, so this is not considered in detail again in this thesis.

The manufacturer's success and the induction of a in this period no longer influences the manufacturer; their positive decision depends on the inter-firm specific unique combination of potential factors (16; 94.12%)[613] and the development of optimal performance bundles between the partners in the ex-ante period to the decision phase, which leads to an optimal solution for the customer. Table 44 shows that the manufacturer in the integration of the customer views the investment only to pay it off, before receiving the award and the order from the airport (17; 100%). Due to the opportunistic behavior of the customer towards manufacturer, who is not taken into account in the contract, the risk of losing the investment due to a combination of potential factors that have enabled the manufacturer to make an offer according to the system specification. Therefore the manufacturer would favor[614] the integration of the customer, as this should also be desirable if they have unique customer access (17; 100%). It would also provide access to follow-up projects (15; 88.24%).

As Table 45 shows, the manufacturers then achieves a CA, and if they succeed on the basis of intangible relational factors (16; 94.12%) to reduce the project risk for customer and manufacturer (10; 58.82%) so that the customer sees an achievement as a factor combination that can be identified as unique, and not to imitate in the short term by the competition (16; 94.12%). As Table 45 shows, from the perspective of the manufacturer intangible factors are at play (7; 41.18%) in the customer's decision that subjectively at least influence preferences (3; 17.65%). This crucial role of intangible relational factors as a CA of the

[613] Cf. Subchapter 10.4.1.2 (Tab. 45).

[614] Cf. Subchapter 10.4.1.2 (Tab. 44).

manufacturer also confirms Table 57, which presents factors determining the success of the competition from the customer´s perspective. This perspective is crucial, because only the airport is responsible for the award decision and knows what factors count that differentiate a manufacturer as more successful than its competitors. The table shows that the strong integration into the development of a problem solution (8; 100%) in order to create the optimum (8; 100%), which is for the airport on an acceptable price level (8: 100%), means good relations with the manufacturers (8; 100%), combined with positive customer experiences (8; 100%), combined with minimal risk of failure (3; 37.5%) and the setting of a (unofficially) manufacturer preference (6; 75%). This means that the manufacturer achieves a CA in this phase, which usually leads to a positive award decision to the advantage of the preferred manufacturer.

10.6.3 Ex-post of the decision

Related to the comparison of expert groups 1 und 2 in the ex-post phase of the decision, the same procedure described in Subchapter 10.6.1 was applied. The comparison is based on Tables 79-86 and presents the following picture:

Inter-firm network (Table 79): The comparison between M_a/M_b and C_a/C_b presents a common willingness to implement the achievement contributions of the partners. In that phase of the project the manufacturer focuses on the execution of the agreed achievement (e.g. the building / installation of the BHS) because this is one of the core competences (M_a/M_b). The vested interest of the manufacturer is in maintaining a good relationship to the customer and the network partners through proactive information sharing concerning the procedural steps planned and executed.

C_a/C_b presents the customer´s contributions as they are related to project management tasks (e.g. project controlling, interface management, etc.), and that offer the customer independent information concerning the status of the project and the budget control, providing transparency for the network partners about the progress of the project, and with the aim of reducing project related risks and increasing their own reputation.

TABLE 79: Inter-firm network related comparison of manufacturer and customer factors ex-post of the decision

Key factor	Related to	M_a	C_a
Inter-firm network	M_b	- Keeping relationship from ex-ante phase - Proactive information - Execution of the achievement - Implementation of customer contributions	- Information - Transparency - Risk anticipation / reduction - Keeping commitments
	C_b	- Achievement contributions according to capabilities - Implementation of non-material network resources	- Knowledge improvement concerning solution - Transparency - Risk reduction - Project control - Project management - Interface management - Independence - Reputation improvement

The contrast between M_a/C_b and C_a/M_b suggests some sort of mutual expectation. M_a/C_b shows expectation from the manufacturer related to the implementation of the achievement contributions of the customer according to their capabilities, which are focused on non-material network resources. C_a/M_b shows that the customer wants to reduce the project risk (C_a/C_b) through the expectation to the manufacturer by keeping commitments, gaining information, being transparent, and also being through early anticipation of risks and risk reduction.

Relationship (Table 80): The comparison between M_a/M_b and C_a/C_b shows that the relationship for both depends on the quality of the relationship between manufacture and customer, which was built in the phase ex-ante to the decision. The manufacturer (M_a/M_b) bases this relationship on intangible relational assets,

such as trust, communication between relevant firms and the fulfillment of commitments.

The manufacturer expects (M_a/C_b) from customer to continue collaborating as in the ex-ante decision phase. The intention of the customer (C_a/C_b) is connected to the safety of the chosen solution, as well as the advantages during the execution of the agreed achievements (e.g. system assembly, etc.) in terms of solving disagreements, and achieving cost reductions that result in project success. The expectation of the customer (C_a/M_b) towards the manufacturer is nearly concludent to the manufacturer´s expectation and relates to a close collaboration that is focused on the achievement, the avoidance of frictions within the project and a stable trustful relationship as in the previous phase of the project.

TABLE 80: Relationship related comparison of manufacturer and customer factors ex-post of the decision

Key factor	**Related to**	**M_a**	**C_a**
Relationship	M_b	- Based on the relationship of ex-ante to the decision phase - Based on intangible relational factors (trust, commitment, communication, etc.)	- Closed focused collaboration - Avoidance of project frictions - stable and trustful relationship
	C_b	- Continuing collaboration from the ex-ante to the decision phase	- Based on the relationship of ex-ante to the decision phase - Solution related safety - Advantage to solve disagreements - Advantage by cost reduction - Project success

Process orientation (Table 81): Comparing M_a/M_b with C_a/C_b, the process orientation presents a slightly different picture between the manufacturer and the customer. The manufacturer (M_a/M_b) is interested in receiving and sharing information concerning the progress of the project that relates to transparency and in generally focuses on the manufacturing and assembly of the BHS. The ex-post phase is usually associated with contractual agreements about the time schedule and customer payments related to the project progress. Professional execution and behavior, the avoidance of disturbances and of conflicts through by related measures, and the overall reduction of process related risks is the focus of attention for the manufacturer.

The customer (C_a/C_b) is more focused on responsibility for contributions based on the synergetic potential factor combinations from the ex-ante to the decision phase. By assuming responsibility for the process stages that the customer is able to execute (e.g. project management, project controlling, interface management, service and maintenance contributions on manufacturer´s behalf, etc.) they follows their intention of improving their own value contributions in order reduce ex-post process related transaction costs.

Therefore the customer expects the manufacturer (C_a/M_b) to support knowledge transfer actively between the partners, to be open to the transfer of the responsibility and the execution of process stages and collaborates with them in a cooperative manner. The table shows that this is similar to the manufacturer (M_a/C_b), who expects the takeover of process contributions based on willingness to become informed, such as for service and maintenance tasks on behalf of the manufacturer, as well as to enhance the customer's involvement in order to anticipate and avoid disturbances during the ex-post of the decision related processes.

TABLE 81: Process orientation related comparison of manufacturer and customer factors ex-post of the decision

Key factor	Related to	M_a	C_a
Process orientation	M_b	- Information about project progress - Measures to avoid project disturbances - Transparency - Professional execution / behavior - Customer involvement - Manufacturing related - Risk reduction	- Support for knowledge transfer - Openness to transfer process steps to the customer - Openness to transfer added value processes to the customer - Cooperative collaboration
	C_b	- Avoidance of disturbances - Involvement - Training measures - Service / maintenance on behalf of the manufacturer	- Depending on ex-ante to the decision related synergetic combination of potential factors - Project control - Project management - Interface management - Reduction of ex-post related transaction costs - Improvement of added value share - Service and maintenance on behalf of the manufacturer

Targeted use of resources (Table 82): Comparing M_a/M_b with C_a/C_b, the targeted use of resources shows that the manufacturer's intention is to avoid losses and process faults by reducing the customer's opportunistic behavior.

TABLE 82: Targeted use of resources related comparison of manufacturer and customer factors ex-post of the decision

Key factor	Related to	M_a	C_a
Targeted use of resources	M_b	- Avoidance of losses - Proactive communication - Interface definition - Avoidance of process faults - Strong relationship management based on relational variables - Reduction of opportunistic customer behavior	- Optimized application of resources / potential factors - Avoidance of process failure
	C_b	- Customer involvement - Avoidance of process faults - Concentration on customer specific core competences - Project planning / management	- Support by targeted use of potential factors / achievement contributions - Avoidance of process failure - Optimized application of resources / potential factors

This is based on the application of relational variables within a strong relationship between those firms that rely on proactive communication and a clear definition of interfaces between the partners. The customer wishes to avoid process failure that would affect the process execution and increase transaction costs. Therefore the customer´s focus is on a targeted and optimized application of resources / potential factors. The expectation of the manufacturer (C_a/M_b) is the same, and is almost the same concerning the manufacturer´s expectation from the customer (M_a/C_b). The customer anticipates involvement through concentration on specific core competences (e.g. project planning, project management, etc.) in order to avoid faults during the the execution of the achievement.

Early acquisition of information and knowledge (Table 83): Comparing M_a/M_b with C_a/C_b, the table shows that the manufacturer (M_a/M_b) allocates the achievement of knowledge to the ex-ante phase of the decision.

TABLE 83: Early acquisition of information and knowledge related comparison of manufacturer and customer factors ex-post of the decision

Key factor	**Related to**	**M_a**	**C_a**
Early acquisition of information and knowledge	M_b	- According to ex-ante of the decision phase - Increase of the exit barriers of the customer - Avoidance of losses by customer exit - Increase of entry barrier for competitors	- Application of common knowledge as much as possible
	C_b	- Protection of common developed solution - Preference commitment	- Application of knowledge as much as possible

The intention is to influence the processes at an later stage of the project to avoid losses by a customer exit ex-post of the decision from the transaction related relationship, the increase of the customer´s exit barrier that also increases the entry barrier for competitors, who are probably able to assume ex-post contributions of the manufacturer if the achievement cannot be realized and the manufacturer does not perform. The customer (C_a/C_b) is focused on the application of knowledge, transferring this knowledge during the ex-ante phase to the decision depending on the use of the absorptive capacity of the customer. The expectation (C_a/M_b) is to use common knowledge developed and accumulated during the ex-ante phase to the decision as much as possible. The

manufacturer´s expectation from the customer (M_a/C_b) is that the customer protects the common solution and makes a commitment to the set preferences.

Increase of deterministic process shares (Table 84): The comparison of M_a/M_b with C_a/C_b shows that the manufacturer's (M_a/M_b) basis for the phase ex-post of the decision on the commitments, and the transparency over achievement contributions according to the phase ex-ante to the decision.

TABLE 84: Increase of deterministic process shares related comparison of manufacturer and customer factors ex-post of the decision

Key factor	**Related to**	**M_a**	**C_a**
Increase of deterministic process shares	M_b	- According to ex-ante to the decision phase - Commitment to achievement contributions - Transparency	- Reductions of risks and disagreements
	C_b	- Depends on the ex-ante to decision agreed achievement contributions - Transparency	- Agreement about contributions as far as possible - Elimination of uncertainties and risks

Similarly to that the customer (C_a/C_b) focuses on his integration and a related agreement in order to gain as many contributions as possible to eliminate risk and uncertainty. The reduction of risks and of disagreements is what the customer expects from the manufacturer (C_a/M_b), who focuses on transparency and customer contributions as agreed in the ex-ante to the decision phase.

Increase of process awareness (Table 85): The comparison of M_a/M_b with C_a/C_b shows the manufacturer (M_a/M_b) as being focused on achievement contributions agreed in the ex-ante to the decision phase and based upon acting transparently according to defined guidelines. As with the customer (C_a/C_b), the

intention is to reduce uncertainties and risks by speedy anticipation and to respond accordingly in order to ensure the processes.

TABLE 85: Increase of process awareness related comparison of manufacturer and customer factors ex-post of the decision

Key factor	**Related to**	**M_a**	**C_a**
Increase of process awareness	M_b	- According to ex-ante of decision the agreed achievement contributions - Transparency - Risk reduction - Acting according to defined guidelines	- Reductions of risks and of disagreements
	C_b	- Focus on processes and agreed achievement contributions - Transparency - Risk reduction - Acting according to defined guidelines	- Elimination of uncertainties and risks - Speedy risk anticipation - Speedy response to risks - Ensuring processes

The reduction of risks and disagreements corresponds to the expectations of the customer from the manufacturer (C_a/M_b), who expects the same from the customer (M_a/C_b), with the additional focus on the customer concerning processes and agreed contributions, transparency, as well as acting according to defined guide lines.

Integrativity (Table 86): The comparison of M_a/M_b with C_a/C_b shows a focus on the manufacturer's side (M_a/M_b) for cooperative collaboration with the customer according to the agreed achievement contributions of the ex-ante to the decision phase.

TABLE 86: Integrativity related comparison of manufacturer and customer factors ex-post of the decision

Key factor	Related to	M_a	C_a
Integrativity	M_b	- Cooperative collaboration - According to the ex-ante to decision phase agreed achievement contributions	- Cooperative collaboration / partnership
	C_b	- Keeping commitments - According to the ex-ante to decision phase agreed achievement contributions	- Cooperative and integrative collaboration / partnership - Insight into added value processes of the manufacturer - Reduction of transaction costs

The expectation towards the customer (M_a/C_b) is related to keeping commitments with the partners and becoming integrated with customer specific achievement contributions as agreed in the ex-ante to the decision phase. The customer (Ca/Cb) focuses on the implementation of his integrative achievement contributions in partnership with the manufacturer. The customer is interested in gaining insight into the added value processes of the manufacturer with the aim of reducing transaction related costs during the ex-post of the decision phase, and expects collaboration from the manufacturer in cooperative manner.

10.7 COMPARATIVE SUMMARY

Additional to Subchapter 10.6 this chapter deals with the comparative summary of the empirical investigation in order to answer the thesis research question. The chapter is therefore divided into subchapters that discuss additional relevant knowledge developed in previous chapters of the thesis.

The comparison of the expert groups I and II presented in Subchapter 10.6 (Table 70) shows that under the conditions of the branch investigated, which is

determined by product homogeneity, intangible factors play a crucial role in differentiating from the competitors. It can be seen that on manufacturer's as well as on customer's side the evaluation by the customer of the relationship factors - aside from the inter-organizational factors - are human specific and information / knowledge based factors, which determine the degree of differentiation of the manufacturers from their branch related competitors in order to achieve CAs (Table 70). Dyer and Singh (1998: 660) also confirm the crucial role of specific relational assets and knowledge sharing routines as potential sources of inter-organizational CA. It can also be shown that tangible inter-organizational factors play only a minor role from the perspective of the manufacturers and customers regarding differentiation from competitors (Table 70).

The evaluation and the interpretation (Subchapters 10.4 to 10.6.3) shows that the integration of the customer in the field of BHSs can be of a phase of related characteristics. This depends on the specificity and complexity of the problem and in solving the problem of the manufacturer and customer achievement contributions. Fließ (2004, p. 528) also argues that the integration of customers can be based on different degrees of integrativity.[615] Table 87 shows different degrees of integration related to the ex-ante phase of the decision, the point of decision and ex-post of the decision, which will be discussed in the following Subchapters 10.7.1 to 10.7.3.

[615] Cf. Subchapter 7.2.2 (Tab. 13).

TABLE 87: Phase related customer integration degrees

Phase	Customer integration			
	Comment	**Low involvement**	**Medium involvement**	**High involvement**
Ex-ante to the decision	As early as possible, before announcement.	Standard achievement	Individualization of standard components.	Co-development and active customer contributions; relevant impulse to start achievement creation process; customer potential factors crucial for achievement result.
Point of decision	Decision making about manufacturer that wins the award	Decision by customer	Decision by customer	Decision by customer
Ex-post of the decision	Execution process of the manufacturing and assembly process of the BHS.	Service and maintenance by the manufacturer on the demand of the customer.	Integration of customer contributions necessary according to specific customer capabilities. Service and maintenance on behalf of the manufacturer. Manufacturer responsible for the achievements.	Integration of customer contributions necessary according to specific capabilities. Service and maintenance on behalf of the manufacturer. Integration partners responsible for their contribution shares.

TABLE 88: Phase related relationship modality

Phase	Relationship modality	
	Product development	**Achievement creation**
Ex-ante to the decision	Co-innovator Informer	Co-producer “Partial employee"[616]
Point of decision	Not specific applicable	Not specific applicable
Ex-post of the decision	Co-innovator	Co-producer “Partial employee”[617]

Source: own adapted illustration according to Kurzmann and Reinecke (2009: 207)

Additionally the investigation suggests a changed customer role of the customer in the relationship with the manufacturer. Table 88 shows this change over the three phases of the project, which is also relevant to the following phase-related discussion.

10.7.1 Ex-ante to the decision

The evaluation and interpretation of the empirical study shows that the activities of manufacturer and customer in the phase ex-ante to the decision are of particular importance. In this phase the parties focus their activities mainly on the early period of the project.[618] This approach is taken, on the one hand, due to the legal regulations of public procurement procedures in the industry, and because the system obliges the customer to comply with the legal requirements from the

[616] Cf. Subchapter 7.1.2 (Tab. 12); in detail: Kurzmann and Reinecke (2009: 207).

[617] Kurzmann and Reinecke (2009: 207).

[618] Cf. Subchapter 10.4.2.3 (Tab. 61, Tab. 62, values: 8; 100%, value: 6; 75%).

beginning of the procurement process (§ 97 GWB). However, the customer is not bound by these rules before the procurement begins. On the other hand there is the desire of the parties to gain an early and advantageous position to compete for the contract to be awarded, since the customer´s system specification (inclusive BoM) and product homogeneity will be produced and product related tangible factors will be eliminated as a way of differentiating the firms.

The study shows that when the manufacturer succeeds in building a positive relationship management to the customer by using intangible factors in the early phase of the project, the manufacturer is enabled to differentiate himselves from the competition through a combination of own and customer-specific potential factors. This enables the manufacturer and the customer in turn to generate achievement bundles that promise an optimal customer-specific solution. This is based on early exchange of information with the customer, in which the parties have the opportunity to evaluate the mutual potential factors and to combine them in cooperation with the customer, developing inter-organizational optimal achievement bundles to solve the customer's problem.

This result for the manufacturer is a temporary and informal CA. This early collaboration, in which the customer takes the active role of informant, can be characterized by average or high involvement. The investigation has shown that an average degree of integration, especially in this early stage in the individualization of standard components (Fließ, 2004: 528, cf. Tab. 13) occurs at airport-specific conditions and the customer thereby takes a more informational and controlling role in the integration project (cf. tab 88, Fließ, 2004: 528-529).

The investigation also shows that by providing information to the manufacturer, as well as a bilateral exchange of information, and engaging in full cooperation, the customer makes the first crucial push (initial) towards the creation of a achievement, which at this stage is the commonly tailored solution to the problem.[619]

[619] Cf. Subchapter 10.4.2.3 (Tab. 63, value: 4; 50%).

TABLE 89: Advantages and disadvantages by customer integration ex-ante to the decision

Phase	Manufacturer		Customer	
	Advantage	**Disadvantage / Risk**	**Advantage**	**Disadvantage / Risk**
Ex-ante to the decision	- Risk reduction - Higher price - Time advantage - Information advantage - Optimized combination of potential factors - Achievement / solution optimization - Preference setting by customer preference - Relationship - Customer involvement (lock-in) - Customer as co-developer	- Product homogeneity - Opportunistic customer behavior - Investment uncertainty - Legal restrictions	- Risk reduction - Lower price - Time advantage - Information advantage - Knowledge improvement - Product homogeneity - Optimized combination of potential factors - Achievement / solution optimization - Relationship - Support to preferred manufacturer - Insight in added value processes of manufacturer - Network access	- Higher price - Resource restrictions - Limited contribution - Legal restrictions

The role of the customer is transformed from an informational to an active role as co-developer of the achievement (cf. Table 13, Table 88) so that it ensures that the achievement contributions can be actively integrated into the development process (Fließ, 2004: 528, Kurzmann and Reinecke, 2009: 206-207).[620]

[620] Cf. Subchapter 10.4.2.2 (Tab. 57, value: 8; 100%), Subchapter 10.4.2.3 (Tab. 59, value: 8; 100%, Tab. 60, value: 8: 100%, Tab. 63, value: 7; 87.50%).

Through the active involvement of the customer, and their controlling and co-developing role in solving the problem, the customer fulfils the role of a co-innovator rather than an informer under the common pre-contractual achievement creation (e.g. system specification, BoMs, etc.) to the co-producer with a high integration degree. The relationship-based identification with the manufacturer and the role of the common achievement creation allows the customer and the manufacturer to act on a common basis and with common routines. This results in the customer´s role as a "partial employee" (Kurzmann and Reinecke, 2009: 207). In both of these cases the involvement of the customer with a high degree of integration is necessary for an optimal achievement result.[621]

This study shows that the process towards is only made possible by the achievement contribution of the customer. With only a low participation from the customer the performance results would be compromised endangered (cf. Table 63)[622]. The high involvement of the customer at this stage is therefore crucial for the final performance of the BHS.[623]

Through the integration of the customer, a commonly developed optimal solution, in combination with the intangible relational factors of the relationship, leads to a lower risk assessment of the integration partners and to a hidden manufacturer preference by the customer. This represents a major CA for the preferred manufacturer, and for the competitors this makes it almost impossible to rival the uniqueness in the short term, so that the preferred manufacturer has a crucial advantage in the competition at this stage.

As we have seen, the disadvantages or risks for the manufacturers, especially concerning product homogeneity, substantially exclude the use of product related tangible factors. Additional risks are justified in the aggressively opportunistic behavior of the customer, who provides the application of the

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[621] Cf. Subchapter 10.4.2.3 (Tab. 63, value: 8; 100%, and related to the integration in existing systems: value: 1; 12.50%).

[622] Cf. Subchapter 10.4.2.3 (Tab. 63, value: 7; 87.50%).

[623] Cf. Subchapter 10.4.2.2 (Tab. 55, value: 2; 25%, Tab. 57, integration of the airport into the development of the solution, value: 8; 100%).

procurement principles in the collaboration with the preferred manufacturer, and develops an optimal solution to the problem.

The manufacturer has, due experience and knowledge of the optimal solution, a time and knowledge related CA in this situation. However, the remuneration of the investments made by the manufacturer in the integration of the customer and the common development of an optimal solution that is carried out ex-post of the decision is uncertain or vulnerable and depends on the intangible relational factors of the integration partners (e.g. trust and the goodwill of the customer) and thus forces the manufacturer towards protective measures.[624]

In addition to the advantages discussed, which also apply to the customer who assures himself additional advantages through insight into the value creation process and the manufacturer´s network. It is desirable for the customer to gain advantages through an increasing independence from the manufacturer by means of knowledge improvement via the evaluation of projects, which may in turn lead to an improvement of bargaining power[625]. This can give the customer an advantageous position concerning the process costs in competition with other airports (Kurzmann and Reinecke, 2009: 206).

Customer related disadvantages or risks are connected with the willingness to pay the preferred manufacturer a higher price than the competitors. This is connected to a high involvement and lower project risks, and may lead to accepting a cost disadvantage that adversely affects the subsequent costs of the baggage handling process.[626] The study also shows that inappropriate and unsuitable resources on customer's side can avoid high integration for the customer and may lead instead to a reduction of achievement contributions for the customer and to a lower level of integration.

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[624] Cf. Subchapter 10.4.1.2 (Tab. 37) and Subchapter 10.4.1.4 (Tab. 52).

[625] The ability to achieve a lower price than in average.

[626] Cf. Subchapter 10.4.2.2 (Tab. 58).

10.7.2 Point of decision

The point of decision is a critical point in the award process for the manufacturer. Table 61 (7; 87.50%)[627] shows that the manufacturer is, because of the customer's internal processes, not involved in the assessment, the evaluation or the decision of the customer (Fig. 35, Fig. 36)[628]. Table 37 (17; 100%)[629] shows that product homogeneity affects the manufacturer as a risk factor because the customer has access to offers from the competition that are based on the same technical system description or BoM.

It is this crucial point that restricts direct access for the manufacturer to the customer, with the potential to influence directly the decision of the airport and thus affect the remuneration for the integration expenses made ex-ante to the decision (Table 90).

TABLE 90: Advantages and disadvantages by customer integration at the point of decision

Phase	Manufacturer		Customer	
	Advantage	**Disadvantage**	**Advantage**	**Disadvantage**
Point of decision	- Evaluation advantage by ex-ante intangible relation specific factors - Preference	- No direct possibilities for influencing the decision making - Product homogeneity	- Product homogeneity - Internal evaluation according to own interests possible - Risk assessment	- Focus on evaluation criteria

[627] Cf. Subchapter 10.4.2.3.

[628] Cf. in detail Subchapter 8.6.4.

[629] Cf. in detail Subchapter 10.4.1.3 and chapter 10.4.1.2 (Tab. 37, value: 2; 11.76%).

The customer's decision is based on the specification of the contract award in favor of the most economical offer (§29 (1) SektVO) based on decision criteria defined by the customer.[630]

Due to the ex-ante to the decision phase built up on intangible factors based relationship with the customer, the voluntary acceptance of the role as co-innovator and co-producer by the customer concerns the common solution within the already settled internal manufacturer preference (Table 56)[631]. This assures the customer of a lower risk of project failure compared to other manufacturers not so involved in the project details. However, this has disadvantages related to time, information and relationship. Table 57 shows that the assurance of a low risk of failure (3; 37.50%) relies on the relationship with the preferred manufacturer (8; 100%), as well as the knowledge achieved by the high level of integration (8; 100%) ex-ante to the decision as success factors to achieve CA. This leads in consequence to an influence on the evaluation criteria at a subjective level that uses the CA of the preferred manufacturer achieved in the ex-ante phase to drive the decision of the customer towards a CA by winning the award for the project (Table 57).[632]

10.7.3 Ex-post of the decision

The ex-post phase of the decision is characterized by the physical provision of in the ex-ante to the decision phase combined and in the point of decision contracted achievement contributions of the integration partners. The contractually secured achievement relationship provides at this stage part of the provision of achievements, allowing the manufacturer opportunity for indirect

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[630] See in detail Subchapter 10.4.3. § 29 (2) SektVO provides examples of decision criteria, such as price, quality, service, technical value, operational costs, etc.

[631] Cf. in detail Subchapter 10.4.2.2.

[632] Cf. in detail Subchapter 10.4.2.2 (Tab. 57, good relationship, value: 8; 100%, positive experience with the manufacturer, value: 8; 100%, relationship to the manufacturer in the evaluation allows other criteria to become secondary, value: 1; 12.50%).

reimbursement of integration-related investments provided ex-ante to the decision. Due to the possibility of covering the costs the manufacturer achieves a CA compared to defeated competitors in the project. The degree of CI can at this stage be from low to high. This depends on the potential factor capabilities and the capacity of the customer, as well as the ability to combine the potential factors with the factors of the manufacturer in order to ensure total achievement (Table 13)[633].

Table 87 shows that at a low degree of integration the manufacturer executes prior agreed achievement contributions, such as service and maintenance, on demand from the customer. At a medium degree of integration customer contributions become necessary according to specific customer capabilities. Service and maintenance achievements e.g. were executed in collaboration with the customer on behalf of the manufacturer, who is responsible for the achievement result (Table 87). The customer assumes the role of a co-producer of his preferred manufacturer in terms of a sub-supplier (Table 88). At a high degree of integration contributions from the customer are required according to specific capabilities (Table 13). The integration partners have full responsibility for their own contribution shares that need to fit to a common achievement result. The role of the customer is that of a co-producing partner integrated into the achievement creation like a "partial employee" (Table 88; Kurzmann and Reinecke, 2009: 207). In such a stage of high involvement the customer is able to execute (e.g. service) maintenance on behalf of the manufacturer, providing independence from the manufacturer`s ability to respond case of an urgent need. Assuming these tasks through the integration of the customer provides that customer with a CA in ensuring iintra-logistical core competences. The advantage for the manufacturer is in cost saving related to the capacity to respond in urgent maintenance cases during the warranty period.

[633] See in detail Subchapter 7.2.2.

TABLE 91: Advantages and disadvantages of customer integration ex-post of the decision

Phase	Manufacturer		Customer	
	Advantage	**Disadvantage / Risk**	**Advantage**	**Disadvantage / Risk**
Ex-post of the decision	- Risk reduction - Reduction of transaction costs - Investment profitability - Optimized achievement - Relationship - Investment advantage in ex-post projects - Customer as co-producer	- Dependence on customer contributions and performance - Insight into added value processes by customer	- Risk reduction - Reduction of transaction costs - Investment profitability - Optimized achievement - Relationship - Preferred manufacturer as co-producer - Insight into added value processes of manufacturer - Improvement of own value shares - Improvement of knowledge, know-how, experience	- Dependence on manufacturer contributions and performance

Additional advantages occur through close, goal oriented collaboration between customer and manufacturer. Because of a relationship based on variables such as trust, commitment, fairness and transparency built into the ex-ante to the decision phase, both partners are enabled to solve frictions and conflicts occurring ex-post of the decision. These issues can generally be solved on a more collaborative basis than in organizations that do not have such a relationship, resulting in an efficiency advantage. This reduces transaction costs for the partners, reducing the risk of project failure. Mutual insight into value creation is seen by the manufacturer as a risk / disadvantage in terms of pricing or the evaluation of the customer concerning the worthiness of an achievement

(Kurzmann and Reinecke, 2009: 206). Contrary to this, the customer identifies it as an advantage.

The common dependency from each other related to the contributions and performance of each partner can be seen as a risk or disadvantage but also as chance or advantage. Due to the effect on performance of the total achievement result and the success of the baggage handling project, there is an exit barrier for both partners, uniting them in order to avoid additional transaction costs that exceed the project budget (Table 52)[634] This occurs through using the inter-organizational optimized potential factors, as well as collaboration, based on intangible relational factors. This strengthens the relationship between the partners and provides an experience and a relationship based CA for the manufacturer in future projects (Table 57)[635].

[634] See in detail Subchapter 10.4.1.5.

[635] See in detail Subchapter 10.4.2.2 and Tab. 57 (positive experience with the manufacturer, value: 8; 100%).

11 CONCLUSION

11.1 RESULT OF THE INVESTIGATION

The empirical investigation considered the information from the experts of both the customer's and the manufacturer's sides, who are representatives of German BHS. The goal of the investigation was to provide, evaluate and to interpret the information in order to answer the central research question of this dissertation: Is customer integration a method that can be used by German manufacturers of baggage handling systems in order to achieve a competitive advantage?

The integration of a firm`s contribution into the achievements of another firm is an approach which that assumes that the two firms are voluntarily willing to collaborate towards a common goal (Kurzmann and Reinecke, 2009: 207). The integration partners follow a common goal in order to solve the customer's problem (Kleinaltenkamp, 1996: 23)[636]. Taking this into account, the dissertation considers the customer's side in order to gain the information relevant to research question.

Based on the intermediate summary[637] the Tables 92a and 92b show the advantages identified through CI and assigns them to the phase related to aspects relationships, human specificity, inter-organization structure, product information and knowledge. The table shows that the integration of the customer provides advantages over three key phases of the project. The investigation also shows that the manufacturer and customer concentrate their activities on the ex-ante phase of the decision, which is crucial for the positioning of the manufacturer during the competition in order to gain the award as a baggage handling system supplier and to build a project related to collaborative inter-firm alliance.

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[636] Cf. Subchapter 7.1.2 (Fig. 8).

[637] See in detail Subchapter 10.7 (Tab. 87; 88); Subchapter 10.7.1 (Tab. 89), Subchapter 10.7.2 (Tab. 90), Subchapter 10.7.3 (Tab. 91).

Within the ex-ante phase of the decision the investigation shows that the early non-restricted phase is the most important sub-phase for a manufacturer for achieving advantages through the application of potential factors consisting of a bundle of tangible assets (e.g. standardized product related to overcoming the entry barrier of professional competence) and intangible relational based assets. This is because at this stage the legal restrictions are not applicable and the parties are not subject to constraints of action before the emergence of product homogeneity. In consequence the manufacturer has the opportunity to include product related tangible factors in its potential factors in order to find the best combination with the customer´s potential factors. The aim of this is to differentiate themselves from the competitors. The investigation presents shows that intangible assets play a crucial role compared to tangible assets and are the key to success in the field of baggage handling projects (Table 70)[638].

The early mutual work on the optimization of potential factor combinations and the related interchange of information, including its common development, builds a relationship between the partners based on intangible relational variables, and this influences the parties behavior during further phases of the project (e.g. ex-ante to the decision/during legal restrictions) and indirectly (e.g. ex-post of the decision).

By the early interchange of information manufacturer and customer are enabled to achieve a time and information related advantage that allows for an early evaluation and combination of their potential factors in a manner that makes the combination valuable, rare, inimitable an non-substitutable (VRIN)[639] and that cannot be provided by competitors in the short term. By goal oriented collaboration between manufacturer and customer a relationship arises based on intangible relational variables, and which is different from an "arm-length relationship" (Dyer and Singh, 1998: 661-662). The intangible relationship variables are based alliance between the partners, and generate CAs through inter-organizational investments in relation specific assets, as well as the exchange of joint-learning based knowledge, complementary scarce resources / capabilities (Dyer and Singh, 1998: 662) and lower transaction costs than those of

[638] See in detail Subchapter 10.6.

[639] See in detail Subchapter 4.3.

competitors. (Williamson, 1985). Table 92a and 92b present CAs related to the the phases and in the further course Tables 94a and 94b will present a summary of this.

TABLE 92a: Potential factor phase related competitive advantages, part 1

Phase	Potential factor	Competitive advantages by customer integration	
		Manufacturer	**Customer**
Ex-ante to the decision	Relationship	- Risk reduction - Price (margin) increase - Customer lock-in - Relationship modality - Preference / barrier	- Risk reduction - Price (margin) decrease - Support of preferred manufacturer - Relationship modality
	Human specificity	- Close relationship with the customer by intangible potential factors	- Close relationship with the manufacturer by intangible potential factors
	Inter-organizational	- Optimized combination of potential factors - Customer lock-in - Relationship modality - Preference - Entry barrier (competition) - Exit barrier (customer)	- Optimized combination of potential factors - Support of preferred manufacturer - Network access - Relationship modality
	Product	- Optimized combination of potential factors - Optimized solution - Relationship modality	- Optimized combination of potential factors - Optimized solution - Product homogeneity - Relationship modality
	Information/ knowledge	- Time advantage - Information advantage - Relationship modality	- Time advantage - Information advantage - Knowledge improvement - Network access - Relationship modality

TABLE 92b: Potential factor phase related competitive advantages, part 2

Phase	Potential factor	Competitive advantages by customer integration	
		Manufacturer	**Customer**
Point of decision	Relationship	- Ex-ante intangible relation specific factors - Preference / barrier	- Defending own interests
	Human specific	- Ex-ante intangible relation specific factors	- Defending own interests
	Inter-organizational	- Ex-ante intangible relation specific factors - Preference / barrier	- Defending own interests - Risk assessment
	Product	- Preference - Relationship modality	- Product homogeneity - Defending own interests
	Information/ knowledge	- Ex-ante intangible relation specific factors - Relationship modality	- Process transparency - Risk assessment
Ex-post of the decision	Relationship	- Risk reduction - Relationship modality	- Risk reduction - Reduction of transaction costs
	Human specific	- Relationship	- Relationship
	Inter-organizational	- Reduction of transaction costs - Relationship modality - Investment profitability - Exit barrier	- Relationship modality - Process transparency - Investment profitability - Improvement of own value shares - Exit barrier
	Product	- Optimized achievement	- Optimized achievement
	Information/ knowledge	- Relationship - Relationship modality	- Relationship - Relationship modality - Knowledge, know-how, experience improvement

During the execution of the project (ex-post of the decision) the advantages of the early project phases influence the performance of both project partners. Table 93 presents a summary of the project phases related to CAs of the manufacturer. This also reflects related customer benefits. Based on the

relationship built ex-ante to the decision phase both partners gain knowledge, risk and cost advantages (exit barrier) during the execution of the project related to the selection of a project partner possibly involved in the project at a lower level. This results in execution related advantages (e.g. less friction, solving problems time / cost saving, faster process management, etc.). On the basis of relational variables, a relationship built on optimal achievement bundles helps to develop a common low risk solution for the customer to solve its problem at low risk combined with strong goal oriented involvement of the parties (e.g. customer´s lock-in). By including the developed solution in the procurement documents an unofficial customer preference (mobility barrier) for the manufacturer is made. The manufacturer has acted as a common development partner with a (hidden) CA towards the manufacturer. The advantages made in the ex-ante phase of the decision arise from a unique relationship, common knowledge and an optimal combination of inter-firm resource factors. The investigation shows that this has impact on the following phases of the project.

During evaluation and decision making by the customer the evaluation criteria are followed and officially published in the project announcement. The position of the manufacturer built in the previous ex-ante phase indirectly influences the decision making that takes place under conditions of product (solution) homogeneity. During this phase the customer is influenced by the relationship, having with the preferred manufacturer and the defense of his own interests the need to execute the project at low risk, on budget and on time. Combining the advantages of the preferred manufacturer, based on time, information, solution-related knowledge, relationship, risk, etc. the manufacturer has built a mobility barrier that provides him with an opportunity to gain the award of the baggage handling project, to achieve a higher price than the competitors, and to gain a refund of the project investment. This represents a CA that leads to the realization of a relational-based rent if the manufacturer is awarded the project. This means that both collaborating partners achieve a CA during the project execution compared to a manufacturing partner who is a second choice.

TABLE 93: Phase related manufacturer´s competitive advantage and customer benefit

Phase	Sub-phase	Manufacturer	Customer
		Competitive advantage	**Benefit**
Ex-ante to the decision	Prior to legal restrictions	- Information advantage - Time advantage - Knowledge advantage - Relationship advantage - Potential factor combination - Preference advantage - Relationship modality - Mobility barrier - Risk advantage	- Direct information - Early beginning / time saving - Development of optimized solution - Trustful collaborative relationship - Focus on preference saves resources - Medium / high involvement - Access to manufacturer´s network - Transparency by relationship modality - Improvement of knowledge based capabilities - Risk reduction
	During legal restrictions	- Unofficial preference - Unofficial relationship advantage - Knowledge advantage - Relationship modality - Unofficial risk advantage	
Point of decision		- Relationship based on ex-ante phase - Unofficial preference - Relationship modality - Risk advantage	- Execution of the project with the customer´s preferred partner - Defense of own interests - Risk reduction
Ex-post of the decision		- Relationship based on ex-ante phase - Relationship modality - Risk advantage - Reduction of transaction costs - Investment profitability - Exit barrier	- Relationship based on ex-ante phase - Relationship modality - Improvement of own value share - Resource investment profitability - Reduction of transaction costs - Improvement of knowledge based capabilities

TABLE 94a: Phase related sources of competitive advantage, part 1

Phase	Sub-phase	Source of competitive advantage	Achieved by
Ex-ante to the decision	Prior to legal restrict-ions	- Inter-organizational investments in relation specific assets	- Close relationship based on intangible variables (e.g. trust, commitment, information, fair behavior, etc.)
		- Exchange of substantial and joint-learning based knowledge	- Combination of information and knowledge based on potential factors of customer and manufacturer
		- Combination of complementary scarce resources / capabilities	- Combination of customer and manufacturer specific potential factors for optimizing achievement bundles providing the best possible resource combination to solve the customer problem
		- Lower transaction costs	- Transaction related time / information advantage / common development optimizes the combination of potential factors for achievement bundles on preferred problem solution and results in lower transaction costs - Intangible relational variables based relationship as cost saving safety measure

Considering the manufacturer's investment in the integration of the customer during the early project phase, he now gains an investment refund in the form of the execution of the order, while the non-selected manufacturers does not. Compared to the successful manufacturer the competitors realize a competitive disadvantage by facing high costs due to a failure to win an investment refund, which might otherwise have had some influence on their behavior related to participation in future projects.

The empirical investigation confirms that firms able to build alliances and to "(…) combine, exchange, or invest in idiosyncratic assets, knowledge, and resources/capabilities, and/or they employ effective governance mechanisms that lower transaction costs or permit the realization of rents through the synergistic

combination of assets, knowledge, or capabilities" can achieve relational rents (Dyer and Singh, 1998: 662).

TABLE 94b: Phase related sources of competitive advantage, part 2

Phase	Sub-phase	Source of competitive advantage	Achieved by
Point of decision		- Inter-organizational investments in relation specific assets	- Close relationship based on intangible variables built in ex-ante phase
		- Exchange of substantial and and joint-learning based knowledge	- Based on the ex-ante to the decision phase achieved commonly developed knowledge
		- Combination of complementary scarce resources / capabilities	- Based on the ex-ante phase achieved optimized combination of customer and manufacturer specific potential factors - Optimized achievement bundles providing the best possible resource combination to solve the customer problem
		- Lower transaction costs	- Combination of intangible relational variables and achievements of the partners - Risk assessment
Ex-post of the decision		- Inter-organizational investments in relation specific assets	- Close relationship based on intangible variables crafted in ex-ante phase
		- Exchange of substantial and joint-learning based knowledge	- Based on the ex-ante to the decision phase achieved information and commonly developed knowledge
		- Combination of complementary scarce resources / capabilities	- Combination of customer and manufacturer specific potential factors to optimized achievement bundles ensures the best possible resource combination to solve the customer problem
		- Lower transaction costs	- Intangible relational variables based relationship ex-ante built as cost saving safety measure that also affect as a CA in ex-post projects

To summarize, it can be stated that the investigation shows that German baggage handling system manufacturers are able to differentiate their from competitors under conditions of product homogeneity if they integrate the customer into the achievement creation process from the outset of the project by using a combination of potential factors that help to build strong collaboration and a sustainable relationship based on intangible variables with the customer.

11.2 SUMMARIZED RESULT

The goal of the dissertation was to answer the central research question of the thesis, which is as follows:

Is customer integration a method that can be applied by German manufacturers of baggage handling systems in order to achieve a competitive advantage?

In order to answer this the thesis applied as a research approach a combination of theoretical based investigation on the applicability of three key approaches in strategic management with an empirical investigation of BHS. The theoretical discussion of the market-based view (MBV) discovered that due to the possibility of copying generic strategies, the inadequate consideration of the environmental impact, together with the inadequate approach in the relationships between the market players in the industry, the MBV is insufficient for the research question comprehensively.[640]

The theoretical discussion of the resource-based view (RBV) discovered that the complementary relationships, and the goal-oriented bundling of resources amongst the market players, comprise a weak approach. The combinations of resources and the complementary relationships between the players in the industry are crucial factors for achieving CAs and economical rents, and thus resulted in the inappropriateness of the RBV to answer the research question comprehensively.[641] The theoretical discussion of the relational view (RV) discovered that the approach focusing on inter-firm networks and inter-organizational relationships as operational success factors can be used as a

[640] Cf. in detail Subchapters 3.5 and 6.1.

[641] Cf. in detail Subchapters 4.6 and 6.2.

complementary supplement to the RBV. The discussion also revealed that the approach focuses on relation-specific assets, knowledge sharing routines, complementary resources / capabilities and effective governance mechanisms as key sources for achieving inter-organizational CAs. All these factors have been taken into consideration when to answering the research question.[642] By the addition of the concept of CI and its success, [643] and considering the frame conditions of the baggage handling industry[644], the empirical investigation had a comprehensive basis on which to answer the research question following the evaluation and interpretation of the empirical investigation. The investigation found out that in a baggage handling project the manufacturers use a combination of tangible and intangible factors in order to differentiate themselves from their competitors.[645] Intangible factors have a crucial role[646] compared to the tangibles[647]. The main impact comes from relationship related, inter-organizational, human specific and information / knowledge related intangible factors. Customers have confirmed this result by their assessment of factors that ensures that a manufacturer succeeds in competition for the customer by a combination of intangible[648] and tangible factors[649]. This shows that both manufacturer and customer identified intangible factors as the key factors to achieve CAs. This result confirms the approach chosen for this study on the relational view.

The investigation also shows that customers and manufacturers divide a baggage handling project into three main process phases: ex-ante to the decision, point of decision, and ex-post of the decision, in which the ex-ante phase is the most critical for manufacturers for achieving CAs, and influences the following

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[642] Cf. in detail Subchapter 5.5 and 6.3.

[643] Cf. in detail Subchapter 7.1.2 (Fig. 8, Fig. 9, Tab. 12), Subchapter 7.6 and Subchapter 9.1.

[644] Cf. in detail Subchapters 8 and 9.2.

[645] Cf. Subchapter 10.6 (Tab. 70).

[646] Cf. Subchapter 10.6 (Tab. 70, value: 158).

[647] Cf. Subchapter 10.6 (Tab. 70, value: 13).

[648] Cf. Subchapter 10.6 (Tab. 70, value: 96).

[649] Cf. Subchapter 10.6 (Tab. 70, value: 9).

phases. During these phases a certain relationship modality between the manufacturer and the customer develops.

During the ex-ante phase the customer is involved as a co-innovator with and informer to the manufacturer concerning product development, and assumes a role as a co-producer and / or "partial employee" (Kurzmann and Reinecke, 2009: 207). During the ex-post decision phase the customer is distinguished[650; 651] as a co-innovator in the development of the product (adaptation of a solution according to environmental changes) and as a co-producer and / or "partial employee" (Kurzmann and Reinecke, 2009: 207) in the achievement stage. Due to the impact of the combination of factors (see above) of manufacturer and customer, and the relationship modality that shows the customer's degree of integration, the integration partners attain advantages that influence their positioning in their individual core businesses (e.g. customer: process costs of baggage handling services compared to other airports). The investigation discovered that the manufacturer achieves CAs over all phases of the project.[652] This is especially so within the legal restrictions that lead to product (system) homogeneity. The way to use the legal system before the restrictions are applied is for the achievement of CAs, the ex-ante phase to the decision is the most relevant phase for the manufacturer. There he has the chance to combine individual tangible and intangible potential factors with those of the customer to create unique symbiotic idiosyncratic achievement bundles that represent the best solution to the customer´s problem. The driving factors for achieving a CA are, under these conditions, based on relational variables in connection with the relationship modality. If the manufacturer is able to realize the ideal potential factor combination, then his competitors face the risk to be the second source in the project, then not being preferred and selected as a project partner by the customer what result in a competitive disadvantage.[653]

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[650] Cf. Subchapter 10.7 (Tab. 88).

[651] Cf. Subchapter 7.2.1 (Tab. 12); in detail: Kurzmann and Reinecke (2009: 207).

[652] Cf. in detail Subchapters 10.7, 10.7.1 (Tab.89), 10.7.2 (Tab. 90), 10.7.3 (Tab. 91) and 11.1 (Tab. 92, Tab. 93).

[653] Cf. in detail Subchapters 10.7.1 and 11.1.

During the decision phase[654] the combination of potential factors built into the previous phase unofficially influences the customer's decision. The investigation discovered that due to product (system) homogeneity and legal restrictions the indirect influence of the previous phase regarding the relationship to the customer is crucial for the success of the manufacturer. The quality of the relational factor combinations and the evaluation of the risk failure influence the customer towards the preferred manufacturer, who gains a CA. The competition then face a disadvantage due to costs related to the previous investments in potential factor combinations with the customer.

During the ex-post phase of the decision[655] advantages accrue that influence the execution of the project (e.g. time and cost saving, etc.) as well as the core businesses of the involved parties in future projects (e.g. reference, relationship, processual excellence, cost situation, knowledge, etc.).

To summarize, the investigation confirms that a German manufacturer able to build an integrated alliance with the customer under the condition that both "(…) combine, exchange, or invest in idiosyncratic assets, knowledge, and resources/capabilities, and/or they employ effective governance mechanisms that lower transaction costs or permit the realization of rents through the synergistic combination of assets, knowledge, or capabilities" can achieve relational rents and CAs (Dyer and Singh, 1998: 662). The CAs achieved by the manufacturer are based on inter-organizational investments in relation-specific assets, a close relationship with the customer based on intangible variables (e.g. trust, commitment, information, fairness, transparency, etc.), the exchange of substantial and joint-learning based knowledge (e.g. time-, information-, knowledge advantage, etc.), as well as combination of complementary scarce resources and capabilities (Dyer and Singh, 1998: 662) and lower transaction costs (Williamson, 1985).[656]

Finally, the investigation shows to that a German manufacturer of baggage handling systems can differentiate itself from competitors and achieve competitive advantages under conditions of product (system) homogeneity if the

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[654] Cf. in detail Subchapters 10.7.2 and 11.1.

[655] Cf. in detail Subchapters 10.7.3 and 11.1.

[656] Cf. in detail Subchapter 11.1 (Tab. 94).

manufacturer integrates the customer into the achievement creation process from the outset of the project by using a combination of potential factors, which help to build a collaborative relationship with the customer. It can be confirmed that customer integration is a method that can be applied by German manufacturers of baggage handling systems to achieve competitive advantages in the airport-specific baggage handling industry.

11.3 CRITICAL APPRAISAL AND LIMITATION OF THE RESEARCH

The topic of this study already predetermines the restrictions on the analysis of the German manufacturers of BHS. Therefore the size of the sample of the analyzis is relatively small. German manufacturers of BHS (expert group I) are at the center of this analysis. Extending the sample to a European or a global analysis was rejected due to access difficulties of the sample as well as cost and time considerations. However, due to the specificity of the industry and its relatively small size, almost all the manufacturers are internationally active, so that their experiences and approaches with international customers subjectively influenced their response in this survey. Under these conditions this results in connection with the limiting element to national customers and manufacturers to a circumscribed view.

Therefore the determined approach of manufacturers and customers reflects, under certain legal circumstances, the procedures for gaining CAs by CI in the national market. Outside of these limits, e.g. in international markets outside the European Union, and due to other legal circumstances and conditions, CI might possibly lose its ability for achieving competitive success due to political interests, and may also become non-viable or less important as an option in the future. This allows scope for further investigations outside the restrictions described, also mentioned in Subchapter 11.4 as an option for further research.

It should also be emphasized that CI is a suitable means of achieving CA under the known conditions as well as under the limiting conditions of the specific industry, although strong relationships based on intangible resources are not generally separated from necessary tangible resources. The reason for this is that in order to produce a BHS, tangible resources are also necessary, but who exactly is to introduce these resources depends on the combination of potential

factors of the integration partners and the development of achievement bundles. Nevertheless, this indicates that the RBV and the RV should not be considered in isolation from each other. Both approaches should build on each other and used in its application related to the respective research question, as well as evaluation of the answers and the reasoning method.

Another critical issue is based on the choice of interview partners. Although the interviewees are on manufacturer´s as well as on the customer´s side management members of the respective firms it succeeded to motivate the interviewees into participation. They have many years of experience in operating activities and therefore were able to provide well-founded statements. The decision to conduct the interview in the form of a telephone survey was based on economic and methodological criteria (e.g. temporary accessibility and availability of the interviewees, cost, implementation period, etc.). The benefits of this kind of interview face some disadvantages. The interviewer for instance can concentrate only on linguistic nuances for emphasizing a statement and has no opportunity to perceive and interpret gestures and facial expressions. This can be seen as a disadvantage as well as an advantage, because the conditions for all interviewees were the same regarding distractions, interruptions or digressions. The interviews were conducted during the period agreed between the interview partners. For the reasons mentioned above, it was possible to limit the period of the interviews to one month to any prevent possible collusion of the interviewees in the context of industry networks.

It was possible, through this time limit, to prevent any collusion between the experts about the content of their answers in the context of their networks within the industry.

The insistence of the experts on receiving the interview guideline in advance of the interview with the aim of legally testing for safety as a condition of the interviews was initially regarded by the interviewer as critical. In due course the test was extremely helpful. In this way it was ensured that the interviews were conducted by juridical approval in an open and constructive manner and without reservations, which was a strong support for the investigation.

11.4 RECOMMENDATION FOR FURTHER RESEARCH

This study examines CI as a method for achieving CAs and economic rents for manufacturers in the airport specific baggage handling industry. CI is a bilateral method in which at least two partners collaborate in order to achieve a common goal. This requires the organization of both integration partners to support the integration process, which is closely connected with the management and the related organization (Kurzmann and Reinecke, 2009: 209). The question concerning the impact on firms within the industry of BHS, and the related measures to adapt an organization to use the method efficiently on a voluntary or non-voluntary basis provides a wide prospect for further research. It would also be appropriate to focus in further research how to measure CAs under such specific conditions of product homogeneity in the industry and to provide a valid scale in order to compare the advantages of firm networks. There is currently no adequate answer from the researcher´s community concerning the relationship between independence and integration, or indeed transparency versus protection against opportunistic behavior, or the bargaining power of the customer, or cost of the integration and the quality of its impact on the organization of the integration partners and their achievements in the industry. Additional research in this direction would be helpful to answer these questions.

Further, it would be useful to get a wider picture by further research with the focus on clarifying the impact of CI in the baggage handling industry by the integration of customers outside Germany or outside the legislation of the European Community. This additional research could lead to specific knowledge about market local approaches of manufacturers and customers in the BHS industry. A comparison with the results of the dissertation on hand would provide a comprehensive picture about the differences and similarities in achieving CAs by CI in this specific industry. This research could lead to a market specific guideline that supports manufacturers in achieving CAs by activities in the considered regions.

Additionally, the integration of key suppliers and third parties as well as the related network relationships could provide a supplemental benefit to the recommended studies above. The possible result would be a full picture about the achievement of CA by CI in the BHS manufacturing industry on a wider or global

scale to the benefit of established and new entry firms in this specific and complex industry.

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APPENDIX I

Main category: Market (manufacturer´s perspective)

Sub-category	Evaluation	Frequ. R1	Frequ. R2
Project availability	Low number of available projects	15	15
	Strong competition for public projects	14	14
	EU-competitors face weak home economy markets	11	11
	Small growth on customer side	4	4
	Competition: EU-low cost	2	2
Behavior	Aggressive competitive behavior	7	6
	Decreasing price level	4	4
	Strong budgeted investment volume on customer side	2	2
Preferences	Preference for national / local suppliers	1	1
	Max. achievement at low price and high flexibility	1	1
	Manufacturer: Focus on national projects	1	1
New entries	EU-competitors aggressive	11	11
	Impact on industry price levels	3	3
	Market entry of industry strangers increases	2	2

Main category: Market (manufacturer´s perspective)

Sub-category	Factors that currently differentiate from competition	Frequ. R1	Frequ. R2
Differentiation factors	Relationship management to customers and system partners	17	17
	Qualification / quality of sales employees	16	16
	Long-term collaboration with the customer	15	15
	Collaboration with leading airports / system manufacturers	15	15
	Good / close contact to customers	14	14
	Robust customer relationship	14	14
	Early involvement of / by customer / manufacturer	14	14
	Knowledge of customer requirements / industry trends	13	13
	Product state-of-the-art (easier entry)	9	8
	Releationship network / synergetic partnerships	8	8
	Use of regional location advantages	3	4
	References	3	3
	Focus on projects below thresholds / partial lots	2	2
	Added customer value	1	1
	Product advantages in accompanying offer	1	1
	Fairness and integrity	1	1
	Neutral consulting / collaboration	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Relevant differentiation factors to achieve competitive advantage	Frequ. R1	Frequ. R2
Factor relevance	Prominence / technical expertise, reference, reputation	17	17
	Access to involved parties / networking	17	17
	Customer consulting in advance of the project tender	17	17
	Functioning sales / customer service	16	15
	Relationship to customer is crucial	16	16
	Understanding of specific requirements in advance of the tender	14	14
	Activities of relational (relationship oriented) character	13	13
	Strong relationship management	10	10
	Early project entry	9	10
	Consulting approach	5	5
	Solution finding in advance of the tender	3	3
	Early information (information advantage)	3	3
	Proximity, local relation	2	2
	Support with system planning	1	1
	Solution orientation	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Barriers to achieving competitive advantage	Frequ. R1	Frequ. R2
Success barriers	Product homogeneity (via specification)	17	17
	Offer comparison / evaluation cost driven	17	17
	Early development of suitable partnerships	17	17
	High expenditures in preliminary phase (goal cost reduction)	16	16
	Deviation from specification only possible by previous announcement	16	16
	High costs of tender preparation	13	13
	Technical advantages cannot be presented	12	12
	Time to prepare tender for short for building relationship management	12	12
	Access to decision makers and planners	7	7
	Selection of suitable partnerships (manufacturer / supplier)	7	7
	Obtaining early information	7	7
	Building relationship with customer	6	6
	Early start of activities in advance of the announcement / invitation to tender	6	6
	Investment with uncertain refund	4	4
	System concept based on foreign planning	2	1
	European invitation to tender: language barriers	1	1
	Observation of access to customer by competitors	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Supporting factors for achieving competitive advantage	Frequ. R1	Frequ. R2
Support	Planner, customer, supplier of sub-systems / components	16	16
	Employees of the customer	15	15
	All sources (also competitors) welcome	8	8
	Politics, associations	2	2
	Customer as best source	2	2
	Manufacturer own employees	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Factors to gain access to support	Frequ. R1	Frequ. R2
Access factor	Active and targeted relationship management	16	16
	Existing contacts (references, LU)	16	16
	Networking (information exchange)	14	14
	Early targeted building-up of sales activities	13	13
	Permanent contact to customers (sustainable relationship building)	6	6
	Employees (identification with project)	2	3

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Factors determining the proceeding after gaining access	Frequ. R1	Frequ. R2
Proceeding after access	Common development (solution based on products)	16	16
	Cooperative collaboration with all parties involved	16	16
	Early use of possibilities for relationship management (trust)	15	15
	Support to customers as early as possible (in advance of public announcement / invitation to tender)	15	15
	Common solution in specification (preference)	15	15
	Investigating / understanding the problems of the customer	13	13
	Strong customer involvement to defend common solution	13	13
	Communication under application of experience and industry knowledge	7	7
	Usage of information advantage	5	5
	Implementation of customer solution proposals in system concept	3	4
	Systematic assessment of entry barriers to competition	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Enforcement factors that determine success in competition	Frequ. R1	Frequ. R2
Success	If the solution for the customer is optimal	16	16
	a price that the customer accepts	16	16
	If the customer defends the commonly developed solution (preference)	16	16
	If the relationship to the customer is so good that other evaluation criteria are secondary	14	14
	If the customer agrees to its integration / involvement	14	14
	Preferences based on relational factors / high involvement / high exit barriers	10	10
	Customized factor combination (tangible, intangible)	5	5
	High entry barriers to the competition	5	5
	Customer as quasi-sales-employee of the manufacturer	3	3
	Competitors with poor access to customers	2	2
	Introduction of subjective factors in the assessment	2	2
	Extension of an existing facility made by ourselves	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Effects on the achievements of the manufacturer	Frequ. R1	Frequ. R2
Achievement effects	Better knowledge about requirements / achievement specification	16	16
	Better risk assessment	16	16
	Lower price (based on risk assessment)	14	14
	Reduced claim management (fewer numbers of points to discuss with the customer)	14	14
	Easier project management by improved access to involved participants	14	14
	Exact calculation possible	13	13
	Targeted product placement in the market possible	8	8
	Unrealistic pricing through false sense of security	7	6
	Project success increased by shared goals	5	5
	Reduced number of claims (cost reduction)	3	3
	Information advantage	3	3
	Increase of efficiency (cost reduction)	2	2
	Effects on all project phases	1	1
	Definition of achievement contributions of the integration partner	1	1

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Effects of customer integration on competitve advantage	Frequ. R1	Frequ. R2
Effects on competitive advantage	Close relationship management (trust)	16	16
	Achievement of CA by information advantage	16	16
	Anticipation of industry development trends / impact	16	16
	Building trust base by bilateral risk reduction	15	15
	Combination of relationships, information advantage, trust as basis to gain faster and more reliable market information	14	14
	Information advantage and reaction advantage crucial / first mover	12	11
	Close customer relationship, collaboration, building trust leading to common success	7	7
	Trust as a basis for follow-up projects	4	4
	Cast of consulting gap (setting of preferences)	2	2
	Sales costs / expenses for customer care decreasing	1	1
	Ability to fill key technologies	1	1
	Due to low risk achievement, higher prices are possible	1	1
	Chance to achieve CA increases with increasing degree of integration	1	2

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	The investment in customer integration is attractive, if …	Frequ. R1	Frequ. R2
Investment attractiveness	…we get the order.	17	15
	…we get unique access to the customer / involved parties.	17	17
	…the customer is satisfied with us.	15	15
	…we get access to follow-up projects.	15	15
	…the customer wants our expertise in advance of new projects.	15	15
	…the customer / project partner recommends us.	14	14
	…the customer contacts us self-motivated for follow-up projects.	10	9
	…we have a CA due to higher information quality and an advantage in time.	10	10
	…the project risk is lower and better to calculate.	10	11
	…a customer relationship (achievement partner) occurs, which is a disadvantage for externals.	5	6
	…we achieve a leading market position and can defend it.	3	3
	…we achieve long-term customer loyalty.	1	2

Main category: Competitive advantage (manufacturer´s perspective)

Sub-category	Determining factors for achieving a competitive advantage	Frequ. R1	Frequ. R2
Determining factors	Factors that rely on relationships between people	16	16
	Unique combination of factors that competitors cannot provide in the short-term	16	16
	Unique combination of manufacturer and customer related factors based on relationship variables	16	16
	Early endorsement of appropriate partnerships	15	14
	Combination of factors containing the lowest risk for the participating firms	10	9
	Relationship management (relational factors) to reduce project risks	10	12
	Intangible factors distinct from the competition	7	7
	Trust, communication, commitment, understanding	7	7
	Early information	5	5
	Preference setting	3	4

Main category: Customer integration (manufacturer´s perspective)

Sub-category	Motivation to collaborate	Frequ. R1	Frequ. R2
Collaboration (pre-phase)	Trust: problem solving skills, innovation, information, communication, commitments	16	16
	Targeted strong application of relationship variables	16	16
	Intensifying of sales (technical sales) activities and interpersonal compatibility	16	16
	Usage/ integration of customer experience / knowledge to develop a solution.	16	16
	Targeted use of references	15	15
	Presentation of know-how, information, knowledge, etc.	15	15
	Problem affinity	15	15

Main category: Customer integration (manufacturer´s perspective)

Sub-category	Motivation to collaborate	Frequ. R1	Frequ. R2
Collaboration (implementaton)	Keeping / fulfillment of commitment	16	16
	Proactive communication / information	16	16
	Professional approach in project implementation	14	14
	Strong relationship management, trust	13	13
	Implementation flexibility	7	7
	Installation of escalation level	4	5
	Increase of customer`s involvement (participation) during implementation	3	3
	Development of application and customer-specific solutions to secure the execution of the project	3	3

Main category: Customer integration (manufacturer´s perspective)

Sub-category	Motivation to collaborate	Frequ. R1	Frequ. R2
Collaboration (finished implementation)			
	Customer training	11	11
	Common development of customized concepts with the customer	8	9

Main category: Customer integration (manufacturer´s perspective)

Sub-category	Indispensable factors for motivating customers to collaborate	Frequ. R1	Frequ. R2
Indispensable	Access to success relevant contact partners	16	16
	Understanding the needs and requirements of the customer	15	15
	Presence of the right capabilities, such as skills, know-how, knowledge, experiences of the participants	15	15
	Information exchange between value chain partners	13	13
	Application of relational factors	10	11
	Value-added partnership between customer and manufacturer	5	5
	Customer open for collaboration	4	4
	Open, targeted communication / information	4	4
	Understanding preferences	4	4
	Support by the management	1	2

Main category: Customer integration (manufacturer´s perspective)

Sub-category	Integrative achievement contribution by the customer	Frequ. R1	Frequ. R2
Contribution / Point of integration	Selection, arrangement, combination of value chain partners (cooperation)	17	17
	Pre-selection of approved candidates invited to tender (competitors)	16	16
	Development of the system specification	16	16
	Project planning	16	16
	Development of a customer-specific problem solving solution	12	12
	Development of the basic system concept	10	10
	Focus on the pre-phase of the project	6	7
	Implementation of the project / project management (related to capabilities)	4	4
	The more complex the solution/implementation, the more difficult the integration of customer contributions	2	2
	No application of manufacturer internal systems by the customer	1	1

Main category: Relationship (manufacturer´s perspective)

Sub-category	Determining factors for relationship building	Frequ. R1	Frequ. R2
Relationship building	Supporting and building of a basis of trust by a combination of relationship factors	17	17
	Communication in an open, consulting, solution oriented manner	17	17
	Fulfillment of commitments / commitment loyalty	16	16
	Development of common ideas to find solutions	16	16
	Staff of sales and customer care with appropriate skills	15	15
	Integration of customer´s solution approaches (customer involvement)	15	16
	Positive feedback by third parties / customer related to issued references / reputation basis	13	13
	Open discussion of solutions and application of experience knowledge	12	12
	Acknowledgement and integration of experiences / skills of the customer	7	8
	Mixture of manipulative consulting methods and common development	1	2

Main category: Relationship (manufacturer´s perspective)

Sub-category	Safeguards against opportunism	Frequ. R1	Frequ. R2
Protection measures	Increase of exit barriers for the customer	16	16
	Increase of the entry barriers for competitors	16	16
	Common solution finding to increase customer involvement	14	14
	Implementation of common problem solution into specification / BoM	12	12
	Increase of customer loyalty	11	11
	Strong relationship management including setting preferences	10	11
	Opportunity costs scenario at relationship change	8	8
	Almost no protection possible because customer is compulsory-opportunistic	2	2
	No disclosure of expert knowledge, solution details, critical issues	2	2
	No insight into the value chain	1	1
	Demarcation by definition of interfaces and competencies	1	1

Main category: Relationship (manufacturer´s perspective)

Sub-category	Safeguards to protect the pre-phase investment	Frequ. R1	Frequ. R2
Protection measures in the pre-phase of the award	Early access to information via relationship management as CA	16	16
	Support of strong involvement of the participating partners	16	16
	Strengthening of relationship management in order to build trust	15	15
	Targeted issuing and use of references	15	15
	Early presentation of achievement capabilities	10	10
	Increase of customer involvement by integration of the customer´s solution	6	6
	No 100% safeguard available	5	5
	Argument with the goal to achieve subjective assessment advantages	5	5
	Influencing and steering of the participants	5	5
	Factor combination: know-how, experience, expertise, relationship management	5	5
	Development of risk scenario against customer´s deviation from common solution	4	5
	Formulation of the draft of the specification / BoM	1	1

Main category: Market (customer´s perspective)

Sub-category	Evaluation	Frequ. R1	Frequ. R2
Project	Award process is ruled	8	8
availability	Strong competition among manufacturers due to low number of available projects	4	4
	System upgrade or extensions at increasing numbers of transfer passengers	4	4
Behavior	Strong competition for sector related orders	2	2
Preferences	Preference on national manufacturers	8	8
	Ensuring system availability and baggage handling capacity	6	7
New entries	Entry difficulties due to preference for national manufacturers	8	8
	Only low number of manufacturers covering whole product range	6	6
	Low number of customers and manufacturers	2	2
	Technical and logistical complexity limits number of suitable manufacturers	1	2

Main category: Competitive advantage (customer´s perspective)

Sub-category	Supporting factors of the airport for achieving competitive advantage by the manufacturer	Frequ. R1	Frequ. R2
Support	Provision of adequate staff with appropriate skills, capabilities, knowledge and know-how	8	8
	Appropriate access to participating parties	8	8
	Information, experience, knowledge	8	8
	Granting of legal rights	7	7
	Inter-organizational collaboration	2	2
	Without support by airport the manufacturer has no possibility for achievement creation (early support)	2	3

Main category: Competitive advantage (customer´s perspective)

Sub-category	Effects by product homogeneity	Frequ. R1	Frequ. R2
Product homogeneity	All manufacturers use the same technical basis	8	8
	Direct and easier comparability of the manufacturers	8	8
	Manufacturers can differentiate only by non-technical factors	8	8
	Airport reduces its transaction costs	8	8
	Easier decision making process	8	8
	Manufacturers differentiating decisions on the basis of certain product characteristics are excluded	7	7
	Manufacturer differentiation: Importance of preliminary phase of the project increases	7	7
	Integration of the airport is optimally possible in the process preliminary to the award instead of in the implementation / installation phase	6	6
	Increasing importance of inter-organizational relationships	5	5
	Increasing relevance of relationship management and relationship variables	5	5
	Relationship management subjectively part of the assessment	3	3
	Generally advantageous for the airport	3	3
	Increasing ex-ante transaction costs of the manufacturer	2	3
	Forces manufacturer to non-product related differentiation measures	2	3
	Preference for well-known manufacturer due to lower risk	1	1

Main category: Competitive advantage (customer´s perspective)

Sub-category	Factors determining success in competition	Frequ. R1	Frequ. R2
Success factors	Optimal solution or achievement package	8	8
	Meeting the accepted price level	8	8
	Airport integrated in finding a solution or development	8	8
	Already existing positive experience with the manufacturer	8	8
	Good relationship with the manufacturer	8	8
	Manufacturer unofficially set as a preference	6	6
	Manufacturer has positive references with leading airports with similar problems to solve and can present verifiable competence	4	4
	Risk of failure is minimal or non-existent	3	3
	Active effort by the manufacturer to lead the project to success	3	3
	Strong relationship management combined with references and low risk	3	3
	Such a good relationship with the manufacturer that in the evaluation allows other criteria to become secondary	1	2
	Economic offer associated with the classification as the best tenderer	1	2

Main category: Competitive advantage (customer´s perspective)

Sub-category	Willingness to accept a higher price by customer integration	Frequ. R1	Frequ. R2
Price sensitivity	Yes, because the price is not the only decision criteria	8	8
	Yes, due to involvement in solution finding and solution development	8	8
	Yes, if the relationship with the manufacturer is good and promises no difficulties for the project execution	8	8
	Yes, because the cheapest solution must not be the optimal solution	7	7
	Economic efficiency is mandatory	7	7
	Risks, strength and weaknesses of the solution will be evaluated	6	7
	Economic aspects are subjectively influenced	2	3
	Yes, due to a better assessment of risks	1	1

Main category: Customer integration (customer´s perspective)

Sub-category	Advantage expectation by customer integration	Frequ. R1	Frequ. R2
Advantage expectation	To always have an overview a of the progress of the project	8	8
	Speedy anticipation and reactions related to risks, avoidance of bottlenecks to secure the course of the project	8	8
	Integration of own ideas and experiences in concept development	8	8
	Knowledge of the common problem solving solution (co-development)	8	8
	Concept designed for the airport´s specific situation (customized)	8	8
	Ability to realize a manufacturer preference (combination) and forcing airport interests at the maximum point of solution safety (reduction of the overall risk)	8	8
	Improvement of specific knowledge and capabilities	7	7
	More independence from the manufacturer to ensure capacity	7	7
	Reputation and reference by providing the manufacturer with a platform to test new products	4	4
	Ensuring the project preliminary and during execution	3	3
	Insight into the cost structure of the manufacturer to better assess the price level	2	3

Main category: Customer integration (customer´s perspective)

Sub-category	Possibilities for the achievement of a customer contribution	Frequ. R1	Frequ. R2
Customer contribution	Planning during preliminary phase of the project	8	8
	Creation and development of the system concept	8	8
	Service and maintenance	8	8
	Development due to experience, know-how and knowledge	6	6
	Project control, interface and project management	2	2
	Synergetic selection of project participants or manufacturer combinations	1	2
	Integration into several phases useful	1	1
	Integration and building preferences preliminary to the invitation to tender	1	2

Main category: Customer integration (customer´s perspective)

Sub-category	Common solutions and achievements were developed…	Frequ. R1	Frequ. R2
Integration point in time	…in the preliminary phase of the project (crucial project phase)	8	8
	…in previous discussions with the participants	8	8
	…in the preliminary project phase when we tried to use already existing technical solutions with the manufacturer	8	8
	…not during the invitation to tender or the award negotiations, because integration there is not possible	7	7
	...during manufacturing of the system, because deviations from the tender are possible	2	2
	…in various phases up to all phases of the collaboration by the exchange of information, communication, knowledge, etc.	2	2

Main category: Customer integration (customer´s perspective)

Sub-category	Integrative achievement contribution by the customer	Frequ. R1	Frequ. R2
Point of integration	Creation of the system specification and BoM	8	8
	General project planning	8	8
	Previous selection of manufacturer candidates invited to tender	8	8
	Combination of firms into value adding partners / cooperation	8	8
	Creation and development of the basic concept of the system	6	6
	Development of a customized problem solving solution	4	4
	Execution of the project / project management	3	3
	Due to the focus on logistics, no development or manufacturing resources available	3	4
	Previous to the process / in all phase of the process chain possible	2	2
	Equalization of the manufacturer´s information deficit	1	2

Main category: Customer integration (customer´s perspective)

Sub-category	Need for customer involvement	Frequ. R1	Frequ. R2
Involvement	Participation of airport-specific factors in application-specific adaptation of standard systems necessary	8	8
	Generally necessary and of crucial and positive influence on the achievement results by common objectives	7	7
	Crucial achievement push is triggered and executed by the airport	4	4
	Necessary for closing the information gap of the manufacturer related to the requirements	2	2
	Mandatory requirement for the modernization of already installed or older systems	1	2
	Participation is not necessary	1	1

Main category: Customer integration (customer´s perspective)

Sub-category	Contribution intensity factors	Frequ. R1	Frequ. R2
Contribution	Necessary because the airport can describe the specific problem / task only	8	8
	If no suitable integration of achievement contributions of the airport are possible, if a high risk of failure is likely	8	8
	Close collaboration specifies the required achievement / development as the basis for the tender	7	7
	Collaboration prior to the tender influences the project / budget safety / system performance positively	7	7
	Manufacturer is forcibly dependent on the contribution of the airport	6	6
	Supporting and purposeful achievement of the airport necessary	6	7
	Support in the execution (e.g. legal rights, media supply, co-ordination)	3	3

Main category: Customer integration (customer´s perspective)

Sub-category	Manufacturer factors as pre-condition for the integration	Frequ. R1	Frequ. R2
Pre-conditions	Understanding of needs and requirements	8	8
	Existence of the right skills and competences	8	8
	Clear definition of the contact persons / interfaces	8	8
	Access to the relevant contact persons, availability	7	7
	Exchange of information between the value chain partners	5	7
	Collaboration of all involved persons with project success as a common goal	4	5
	Willingness to collaborate without safeguards prior to the order	2	2
	Professionalism, co-operative behavior, information about limits in achievements	2	2

Main category: Customer integration (customer´s perspective)

Sub-category	Special attention to …	Frequ. R1	Frequ. R2
Attention	Relationship to the manufacturer by intangible relational factors	8	8
	Convenient sustainable access to contact partners	8	8
	Building a relationship network	6	1
	Integration of own ideas / contribution to solution	2	2
	Detailed knowledge of the added value chain of the manufacturer	1	1

Main category: Relationship (customer´s perspective)

Sub-category	Role of relationship to the manufacturer	Frequ. R1	Frequ. R2
Role of relationship	Reduces the risk of incorrect assignment and creates trust	8	8
	Affects price positively	8	8
	Easier to deal with project inconsistencies	8	8
	Useful in communication and project execution	7	8
	Unofficially strong role in all process steps	6	6
	Decisively influencing the project´s success	3	3
	Affects price negatively	2	2
	May play no special role in the allocation process	2	2
	Subjective part in the rating	2	3

Main category: Relationship (customer´s perspective)

Sub-category	Relevant factors to build a relationship with the manufacturer	Frequ. R1	Frequ. R2
Relationship factors	Open solution-oriented communication	8	8
	Fulfillment of commitments as a basis for trust	8	8
	Common approaches / development for solution finding	8	8
	Support / build-up of trust as a basis for co-operation	8	8
	Integration of solution approaches for the customer to increase involvement	8	8
	Positive reference by third parties for strengthening of reputation	6	6
	Combination of different relational factors	4	4
	Appreciation / Integration of existing experiences and competences	2	2
	Teamwork with the goal of project success	2	2

APPENDIX II

Comparison of manufacturer and customer factors
ex-ante to the decision, part 1

Key factor	Related to	M_a	C_a
Inter-firm network	M_b	- Early synergetic combination of network resources - Early combination of potential factors; equalization of deficits - Support to customer and third parties - Early share of information - Taking influence on solution finding - CA by information and time	- Input of potential factors - Adaptation of existing solutions to the customer problem - Common solution development discussions - Equalization of factor deficits - Common customized solution
	C_b	- Selection, arrangement, combination of value chain partner, - Pre-selection of competitors - Planning, development of specifications / concepts	- Early synergetic combination of relevant network resources - Building preferences - Risk reduction - Willingness to collaborate / to get integrated - Support by information, experience knowledge, legal rights, skilled contact persons - Equalization of factor deficits - Planning, experience based concept development - Providing relevant potential factors - Information, transparence - Solution safety and specificity, - Enforcement of own preferences - Knowledge improvement - Improvement of independence

Comparison of manufacturer and customer factors
ex-ante to the decision, part 2

Key factor	Related to	M_a	C_a
Relationship	M_b	- Overcoming success barriers - building loadable relationship to customer - Useful access to customer - Intensive contact and communication with customer - Improvement of sales activities - Information about factor deficits on customer side - Information / time advantage - Risk evaluation, price calculation - Building trust by commitment, communication, understanding - Use of skilled people - Higher price	- Combination of relationship variables - Lower price - Integration of customer ideas - Risk reduction - Team work with a common goal - Easier solve of conflicts - Synergies in potential factors
	C_b	- Keeping commitments - Willingness to support - Fairness, open solution oriented communication - Use of skilled people - Access to people - Setting manufacturer preference	- Building trust by communication and keeping commitments - Common development - Integration of customer ideas - Common goal: project success - Acknowledgement of customer experiences and competences - Synergetic use of potential factors - Reduction of risk to fail - Easy solve of conflicts - Advantage in project execution - Lower project costs / lower price

Comparison of manufacturer and customer factors
ex-ante to the decision, part 3

Key factor	Related to	M_a	C_a
Process orientation	M_b	- Motivation of the customer - Use of relational variables - Open customer for collaboration - Getting information - Equalization of factor deficits - Crafting achievement bundles - Improvement of sales activities - Use of references and customer know-how and experiences - Increase mobility barrier - Access to relevant people - Skilled people - Understanding of customer needs	- Integration of customer achievements - Building early inter-firm resource relations - Combination of potential factors and achievement bundles
	C_b	- Selection, arrangement, combination of cooperation partner - Selection of approved competitors for submitting offer - Specification, basic concept - Customized solution development - Identification with the common solution and protection - Setting preferences	- Intention to integration customer achievements in several phases - Planning, concept development - Integration of specific experience, Knowledge, know-how - Previous selection of approved manufacturers - Combination of achievement partner - Building inter-firm resource factor relations - Lowering transaction costs

Comparison of manufacturer and customer factors
ex-ante to the decision, part 4

Key factor	Related to	M_a	C_a
Targeted use of resources	M_b	- Detailed information and knowledge about the requested achievements and specification - Intensive sales-technical activities - Risk anticipation - Combination of potential factors - Understanding of customer´s problem - Protection against investment losses - Common development of optimized solution with customer - Optimized solution as system specification - Increase of exit barrier for customer - Use of relational factors - Clear definition of interfaces and escalation procedure - Improvement customer involvement - Strong relationship	- Idiosyncratic combination of potential factors - Common development of the system concept as a basis for the procurement - Optimal combination of potential factors to achievement bundles
	C_b	- Customer involvement - Integration of customer´s competences - Project planning, project management	- Reduction of project risk - Budgeting safety - Ensurement of system performance - Impuls to start achievement - Equalization of information deficits of the manufacturer - Early selection of potential manufacturers - Early combination of potential factors

Comparison of manufacturer and customer factors
ex-ante to the decision, part 5

Key factor	Related to	Ma	Ca
Early information and knowledge processes	Mb	- Early development of useful partnerhips - Building relationship to customer - Access to decision makers and planner - Early information to equalize potential factor deficits - Development of a unique optimized factor combination - Early project entry - Customer consulting - Time and information advantage - Building trust - Reduction of opportunistic behavior - Increase of exit barriers for customer	- Cumulation of potential factors shall promise the solution of the customer´s problem - Willingness to share knowledge - Early evaluation of achievement bundles
	Cb	- Willingness to get integrated - Potential for optimized factor combination - Improvement and use of absorbtive capacity - Common useful problem solution - Acceptance of price level - Setting preferences - Internal and external protection of common solution	- Application of cognititve knowledge in all phases of the project - Discussion with potential preselected manufacturers before announcement of the project - customized adaptation of existing technical solutions - knowledge transfer - knowledge sharing routines

Comparison of manufacturer and customer factors
ex-ante to the decision, part 6

Key factor	Related to	M_a	C_a
Increase of deterministic process shares	M_b	- Overcoming success barriers - Optimization of potential factors acc. to customer - Description of the achievement - valid complete information - information and knowledge advantage - agreed project goals - agreed partner specific partial achievements	- Active development - High integration degree - Safety about required achievement contributions and bundles - Transparency - Reduction of uncertainty and information deficits - Process ensureness - Risk reduction
	C_b	- Willingness to set preferences - Strong involvement in the solution development - Willingness to describe the achievement - Willingness to invest in potential factors in the collaboration - Agreement about project goals - Agreement about partner specific partial achievements	- Transparency about partner specific achievements - Integration of requirements into system specification - Integration of customer specific achievement contributions - Active control and development of the solution - Agreement about project partner specific achievement contributions - Achieving high integration degree - Decrease of transaction costs

Comparison of manufacturer and customer factors
ex-ante to the decision, part 7

Key factor	**Related to**	**M_a**	**C_a**
Increase of process awareness	M_b	- Reduction / elimination of uncertainties and risks - Unique factor combinations - Integration of the customer	- Early evaluation, selection and combination of potential factors
	C_b	- Success related understanding about quality of customer achievement contributions - Selection of partner - Project planning,development of a specific problem solution - Development of basic system concept - Support of unique factor combinations	- Reduction / elimination of uncertainties and risks - Setting preferences - Quick risk anticipation - Quick activities to ensure processes over all project phases - Integration of achievement contributions in several project phases

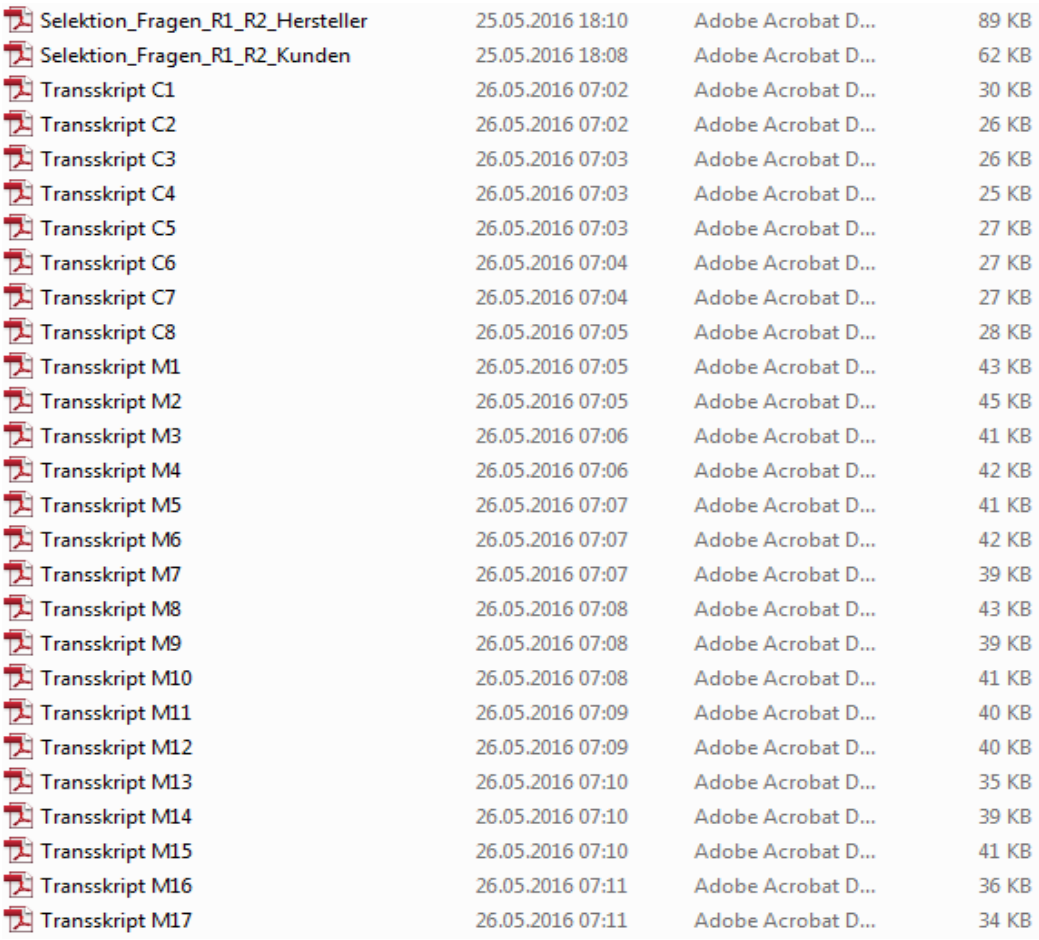
Comparison of manufacturer and customer factors
ex-ante to the decision, part 8

Key factor	Related to	M_a	C_a
Integrativity	M_b	- Cooperative collaboration - Common solution based on existing system components - Motivation of the customer to collaborate - Relationship / use of intangible relational factors - Interchange of information - Common developed solution as basis for system specification	- Building a integrative achievement relationship - Understanding project specific needs and requirements - Competence - Professional and skilled people - Clear interfaces and contact persons for information interchange - Following a common goal - Identification with the project - Willingness to collaborate - Cooperative behavior - By own initiative motivated presentation of achievement limitations
	C_b	- Customer as a achievement partner - Access to relevant people - Skilled people with know-how and experience - Willingness to interchange information	- Access to a preferred problem solution - Cooperative collaboration - Ability to defend solution internally and externally by high integration degree - Highest integration intensity - Early anticipation of risks of uncertainties - Building relationship / network - Insight in added value processes of the manufacturer

APPENDIX III

DECLARATION

Hereby I declare that the following listed PDF-documents in German language are separately transfered with the thesis document to the UCAM:



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Selektion_Fragen_R1_R2_Kunden	25.05.2016 18:08	Adobe Acrobat D...	62 KB
Transskript C1	26.05.2016 07:02	Adobe Acrobat D...	30 KB
Transskript C2	26.05.2016 07:02	Adobe Acrobat D...	26 KB
Transskript C3	26.05.2016 07:03	Adobe Acrobat D...	26 KB
Transskript C4	26.05.2016 07:03	Adobe Acrobat D...	25 KB
Transskript C5	26.05.2016 07:03	Adobe Acrobat D...	27 KB
Transskript C6	26.05.2016 07:04	Adobe Acrobat D...	27 KB
Transskript C7	26.05.2016 07:04	Adobe Acrobat D...	27 KB
Transskript C8	26.05.2016 07:05	Adobe Acrobat D...	28 KB
Transskript M1	26.05.2016 07:05	Adobe Acrobat D...	43 KB
Transskript M2	26.05.2016 07:05	Adobe Acrobat D...	45 KB
Transskript M3	26.05.2016 07:06	Adobe Acrobat D...	41 KB
Transskript M4	26.05.2016 07:06	Adobe Acrobat D...	42 KB
Transskript M5	26.05.2016 07:07	Adobe Acrobat D...	41 KB
Transskript M6	26.05.2016 07:07	Adobe Acrobat D...	42 KB
Transskript M7	26.05.2016 07:07	Adobe Acrobat D...	39 KB
Transskript M8	26.05.2016 07:08	Adobe Acrobat D...	43 KB
Transskript M9	26.05.2016 07:08	Adobe Acrobat D...	39 KB
Transskript M10	26.05.2016 07:08	Adobe Acrobat D...	41 KB
Transskript M11	26.05.2016 07:09	Adobe Acrobat D...	40 KB
Transskript M12	26.05.2016 07:09	Adobe Acrobat D...	40 KB
Transskript M13	26.05.2016 07:10	Adobe Acrobat D...	35 KB
Transskript M14	26.05.2016 07:10	Adobe Acrobat D...	39 KB
Transskript M15	26.05.2016 07:10	Adobe Acrobat D...	41 KB
Transskript M16	26.05.2016 07:11	Adobe Acrobat D...	36 KB
Transskript M17	26.05.2016 07:11	Adobe Acrobat D...	34 KB

Hamburg, September 22, 2016

Uwe Schindler