THE UNIVERSITY OF HULL

Supply chain management in small and medium sized companies – opportunity or obstacle?

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by
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ABSTRACT

The purpose of this thesis is to establish how supply chain management expertise can be developed and embedded in a small and medium sized enterprise that will both enhance the efficiency of the existing business and create an additional business opportunity.

In order to achieve this, the following aims have been set. A review of the latest academic literature concerning supply chain management and implementation of supply chain management in small and medium sized enterprises and the development of a framework of critical aspects for supply chain management implementation. In addition a case study of a two year knowledge transfer partnership between a company and a university has been conducted. From the case study it has been derived how supply chain management expertise can be developed and embedded in SMEs.

For the methodology the action research and the case study approach have been chosen.

The findings of the thesis confirm the characteristics and issues described in previous SME literature. Furthermore this two year study contributes to existing literature through in-depth understanding of the development process of supply chain management implementation in small and medium sized enterprises. In addition a holistic framework for supply chain management implementation in small and medium sized enterprises is provided, which also considers the importance of change and project management. In addition it is suggested that the solution should be tailored to the needs of a small and medium sized enterprise in order to correspond to time and resource constraints in small firms. Furthermore the thesis describes continuous improvement as a means for change management as well as for the embedment of collaboration in a small firm. Moreover it has been reconfirmed that also in small companies internal integration needs to be established before external integration and collaboration can take place.

The value of this thesis lies in its attempt to establish how supply chain management in small and medium enterprises can be established through a knowledge transfer partnership with an external body (a university) and the development of a framework for implementation.

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ABBREVIATIONS

AR .....Action research
BPR .....Business process reengineering
BI.....Business intelligence
CI.....Continuous improvement
ECR.....Efficient consumer response
EDI.....Electronic data interchange
EPR .....Enterprise resource planning
IT .....Information technology
JIT .....Just-in-time
KTP .....Knowledge transfer partnership
LE.....Large enterprise
PIE.....Process improvement efficiency
QSAM .....Quick scan auditing methodology
SCM .....Supply chain management
SRM .....Supplier relationship management
SME .....Small and medium sized enterprise
TQM.....Total quality management
VMI.....Vendor managed inventory
3PL.....Third party logistics

> "The social universe has no "natural laws" as the physical sciences do. It is thus subject to continuous change. This means that assumptions that were valid yesterday can become invalid and, indeed, totally misleading in no time at all." (Management's New Paradigms, Drucker, 1998).

CHAPTER 1 INTRODUCTION

In the battle of Salamis 480 BCE between an ally of Greek states and the Persian Empire the Greek marine tried to fight the Persians without a chance. They were heavily defeated in the battle and in the end the Persians captured parts of Greece. Historians see the main reason for the defeat in the Greeks' smaller sized ships and the much smaller fleet compared to the Persian ships (Strauss, 2004).

When it comes to supply chain management (SCM) and small and middle sized enterprises (SMEs) a similar fate seems to be in store for them. More and more large enterprises (LEs) engage and excel in SCM, whereas certain academics do not see a fit between SMEs and SCM (Brau et al., 2007; Arend and Wiesner, 2005). This could impose a competitive disadvantage for SMEs as it is predicted that companies will not compete with their products in the future but through SCM (Christopher, 2005). Research concerning SCM in SMEs is still in its early days. Therefore this thesis aims at researching how supply chain management can be established in SMEs. Should SMEs stay away from SCM or is SCM an untapped opportunity for SMEs?

The following research aim and objectives have been set for this thesis:

Research aim

- To establish how supply chain management expertise can be developed and embedded in a SME that will both enhance the efficiency of the existing business and create an additional business opportunity

Research objectives

1. Review the latest academic literature concerning supply chain management and implementation of supply chain management in SMEs
2. Develop a framework of critical aspects for implementation of supply chain management in SMEs for project managers / supply chain executives from the literature review

3. Conduct a case study of a year supply chain management in a Knowledge Transfer Partnership (KTP) project
4. Derive from the case study how supply chain management expertise can be developed and embedded in SMEs

This research is embedded in a Knowledge Transfer Partnership (KTP) and aims at evaluating the KTP project from an academic viewpoint.

Knowledge Transfer Partnership (KTP) is a UK wide programme aiming at improving businesses' competitiveness and profitability. It is sponsored by the Technology Strategy Board. Depending on the financial background of the applying companies, full or partial sponsorship can be obtained. A KTP must aim at contributing to a company's strategy and innovation efforts, in order to help the business grow. A KTP consists of three parties: a company, a university and a KTP associate. The university and company are represented by KTP supervisors, closely working with the KTP associate. Through the collaboration between a university and a company, knowledge, technology and skills should mutually be exchanged. In most of the cases the associate is based in the company managing and developing a strategic project. The company supervisor supports the associate in the day-to-day issues concerning the project, whereas the university supervisor contributes relevant knowledge and academic support. The projects can take between one and a half and three years. The associate's personal development is sponsored through a budget for training (Knowledge Transfer Partnerships, 2010).

In this particular case the KTP project is laid out for two years. A KTP associate (the researcher) has been recruited. The associate graduated from a MSc course in Logistics and Supply Chain Management and holds a BA in Business Administration and has been appointed as a project manager. Prerequisite for a KTP is a grant application and proposal for a project. The grant application and proposal also forms the basis for the KTP, as it lays out the project plan and aims for the KTP. The aim of the KTP as stated in the KTP grant application and proposal form is: "To develop and embed supply chain management expertise that will both enhance the efficiency of the existing business and create an additional business opportunity."

The thesis is divided into seven chapters.

- In the introduction (chapter one), the research topic is introduced and the research aim and objectives are presented.

- The literature review (chapter two) discusses supply chain management in general and for SMEs in particular. It also researches aspects concerning the implementation of SCM in SMEs.
- In the methodology (chapter three) the research philosophy and the research approach for this thesis are discussed. Furthermore the research process is explained.
- The case study (chapter four) depicts a thorough overview of the focal company's supply chain structures and supply chain performance. Also the business context is described.
- In chapter five the case study is analysed and recommendations are made and justified. Furthermore the implementation of the recommendation is laid out.
- Chapter six further elaborates on additional aspects which have not been covered in the case study and the recommendations, but which have supported the implementation process.
- In chapter seven conclusions from the research are drawn and limitations and opportunities for further research are described (Figure 1).

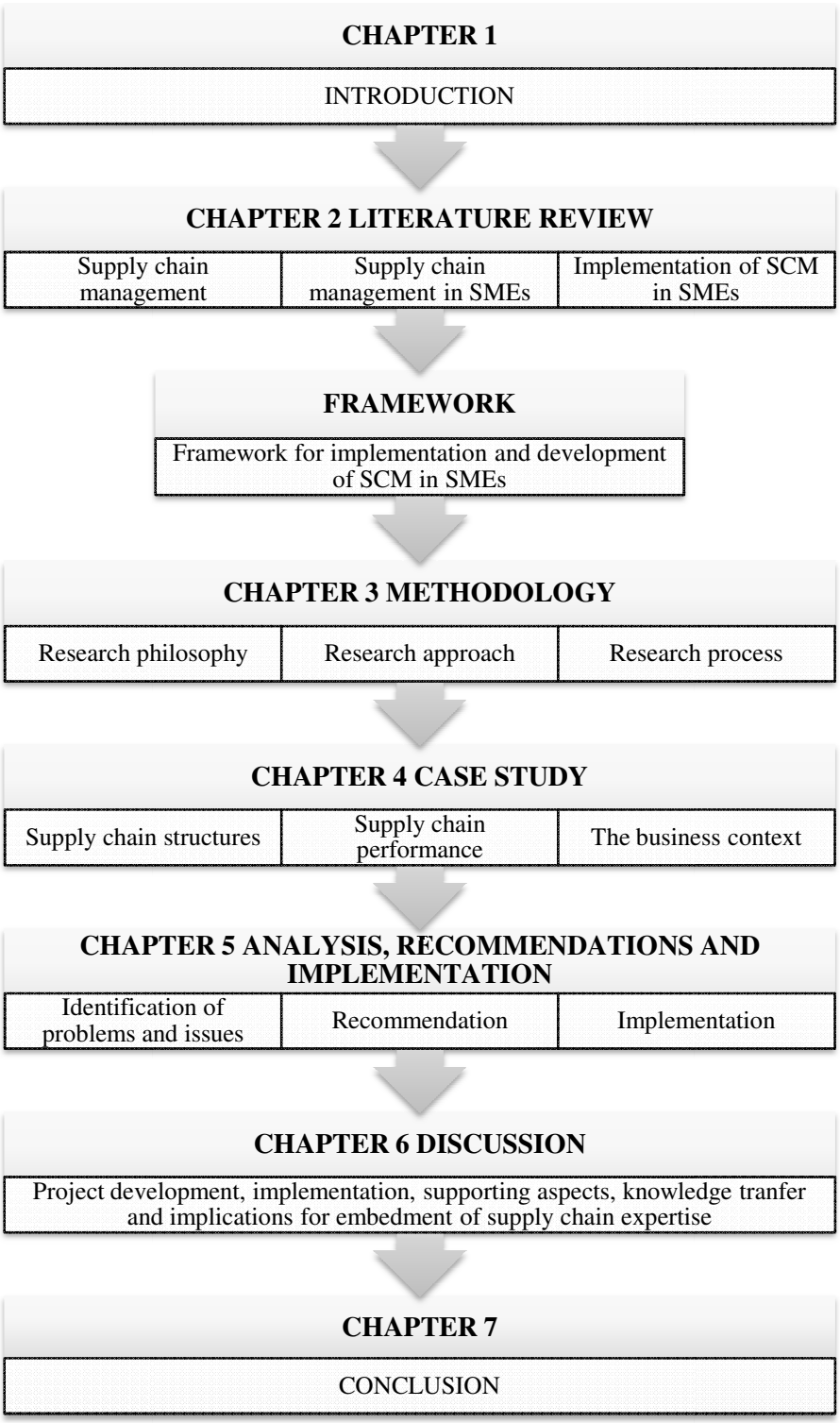

Figure 1 Structure of the thesis

CHAPTER 2 LITERATURE REVIEW

2.1 Supply chain management

Over the past years supply chain management (SCM) emerged as a novel managerial practice, which can influence the efficiency of a firm's supply chain and ultimately can contribute to the bottom line. In order to outline SCM and provide a basis for the second part of this literature review, this section looks at the basic concepts of SCM. First SCM is defined and the evolution of logistics and SCM is understood. Then a differentiation between logistics and SCM is made. SCM and operations as functions are compared and the significance of strategy deployment for SCM is elaborated upon. Finally the concept of supply chain integration as an important tool for SCM is discussed and further SCM practices are introduced.

2.1.1 Definition of supply chain management

In order to define SCM for the purpose of this thesis, first this paragraph reviews different definitions of SCM. Then the understanding of SCM is broadened by elaborating on benefits and features of SCM.

Bowersox et al., 2010, p.4	"Supply chain management consists of firms collaborating to leverage strategic positioning and to improve operating efficiency. For each firm involved, the supply chain relationship reflects a strategic choice."
Chopra and Meindl, 2007, p. 6	"Effective supply chain management involves the management of supply chain assets and product, information, and fund flows to maximize total supply chain profitability."
Christopher, 2005, p. 5	"The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole."
Cooper et al., 1997, p. 1	"The process of planning, implementing, and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information flow from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements."
Gibson et al., 2005, p.	"Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies."
Harrison and van Hoeck, 2008, p. 6	"Supply chain management: Planning and controlling all of the business processes - from end-customer to raw material suppliers - that link together partners in a supply chain in order to serve the needs of the end-customer."
Lummus and Vokurka, 1999, p. 17	"All the activities involved in delivering a product from raw material through to the customer including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution

	across all cannels, delivery to the customer and the information systems necessary to monitor all of these activities. Supply chain management coordinates and integrates all of these activities into a seamless process. It links all of the partners in the chain including departments within an organization and the external partners including suppliers, carriers, third-party companies and information systems providers."
Mentzer et al., 2001, p. 18	"(...) supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole."

Table 1 Definitions of supply chain management

By comparing the definitions of SCM in Table 1, it becomes obvious that there are intersections between the definitions, but they put different emphases on the various attributes of SCM. This shows an inconsistency of the definitions of SCM in academic literature. Some definitions mention that some sort of business management, relationship management, partnering or collaboration with other members (suppliers and customers) in the supply chain and a holistic view on the supply chain are necessary for SCM. Others depict the management of the flow of material, information and capital as SCM. Also the goals of reducing costs, improving profitability and improving customer service through SCM are mentioned.

Figure 2summarizes the attributes of SCM mentioned in the definitions in Table 1.

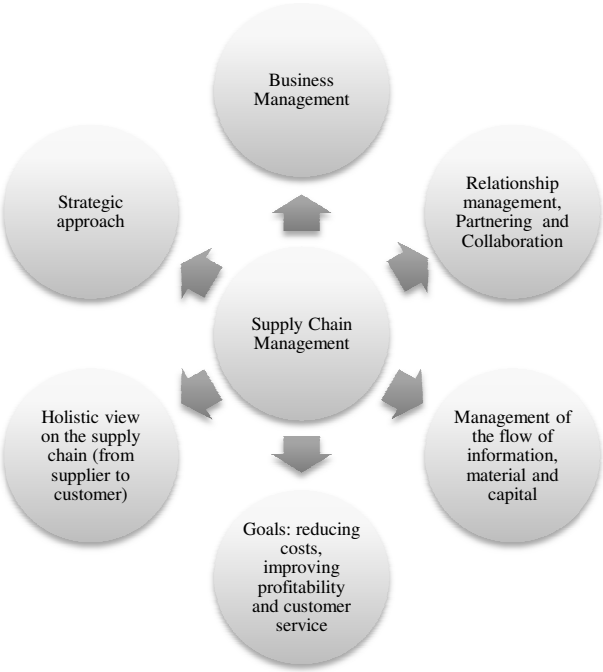

Figure 2 Attributes of SCM

Academic literature reports several benefits of adopting SCM. SCM allows a company to focus on its core competencies by outsourcing supporting functions to partners in the supply chain. A prerequisite for this is to establish relationships with other firms in the supply chain in order to gain from their complementary competencies. Furthermore SCM can improve customer satisfaction by enhancing economic value. Through

improved asset utilization, costs can be reduced and profit increased. Overall it has been argued that SCM contributes to the competitive advantage of a company (Boon-itt and Wong, 2011; Brau et al., 2007; Cooper and Ellram, 1993; Cooper et al., 1997; Flynn et al., 2010; Giunipero and Brand, 1996; La Londe, 1997; Mentzer et al., 2001).

While designing a supply chain one should keep several features of SCM in mind. The backbone of a SCM framework should be its managerial elements, business processes and the overall supply chain structure, which also should take planning, activity overseeing and flows within the supply chain into consideration. In order to achieve a seamless supply chain it is essential to integrate functions and organizations within the supply chain (Ballou, 2007; Cooper et al., 1997; Mentzer et al., 2001). Integration of the supply chain is discussed in more detail in section 2.1.5 Supply chain integration and business processes. Companies which are successful in supply chain management are customer focused, involve their suppliers, use technology to improve productivity, new product development and customer satisfaction and differentiate between new product development and innovation. On the contrary less agile companies tend to concentrate on their internal processes and outcomes, whilst having less focus on suppliers and technology for performance improvement (Power et al., 2001).

2.1.2 Evolution of logistics and supply chain management

In order to be able to evaluate the current state of SCM in general, but especially in SMEs for part two and three of this chapter, it is worthwhile to explore the roots and origins of SCM (Ballou, 2007). The paragraph below briefly restructures the history and development of SCM. The development of SCM is also interwoven with the development of logistics.

Generally, business practices have not seen major changes since the industrial revolution. Only when the market power shifted from sellers to buyers, practices for serving customers were overhauled (Bowersox et al., 2010; Doyle, 2011). Accordingly in the 1960s business practices changed from transactional to relational (Sheth and Parvatiyar, 1995). Physical distribution was born, which is the management of activities concerned with supplying customers. In the early days, physical distribution was closely linked to the marketing discipline as part of the marketing mix. It was seen as a pure transport function and distribution systems were unstructured.

Slowly companies started to include inbound supply in the physical distribution concept. This was promoted by the recognition that transport, storage, materials handling and packaging are inter-related and should be managed with a focus on costs

and customer service. Physical distribution was called business logistics. The term business logistics was chosen to differentiate it from logistics, which was previously closely associated with the armed forces.

In the 1970s and 1980s companies started to include physical distribution in the functional management of purchasing and manufacturing. This was promoted by increasing costs, understanding of the total cost concept, high competition, changes in technology and distribution channels. Also business logistics became more professional and the 3PL (third party logistics) industry started to emerge. Next companies aligned the management of materials with physical distribution internally and beyond company boundaries which is widely described as the starting point for logistics.

From the 1990s information systems were further developed, accessible to a wider audience and acquisition costs were affordable. Supported by the development of information technology (IT) companies started to integrate logistics with strategic planning, finance and marketing – SCM was born. The development of physical distribution, business logistics, logistics and SCM is also depicted in Figure 3.

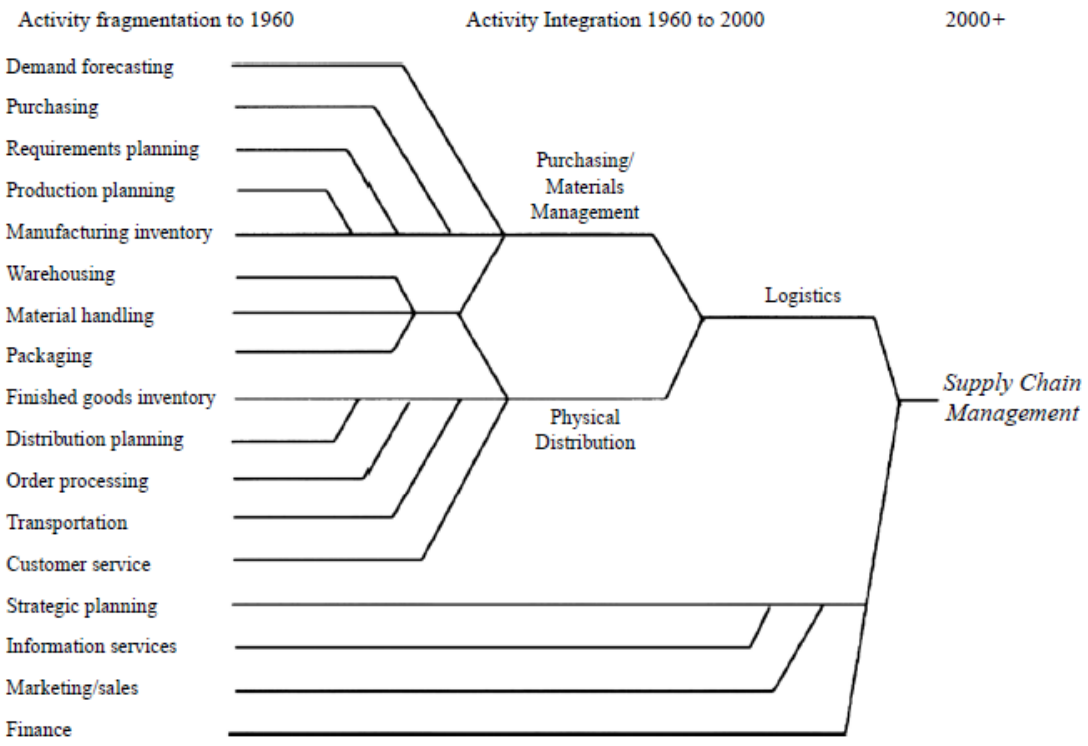

Figure 3 Evolution of logistical integration

(Ballou, 2007, p. 338)

These days leading organizations recognize the value-adding role of logistics (Ballou, 2007; Halley and Guilhon, 1997; Hesse and Rodrigue, 2004; Rushton et al., 2009). Ultimately the availability of affordable information technology and software supported businesses' endeavour to achieve competitive advantage in the supply chain (Arend and

Wiesner, 2005; Bowersox et al., 2010). “In the information age the reality of business connectivity continues to drive a new order of relationships called supply chain management. (...) Perfect orders – delivering the desired assortment and quantity of products to the right location on time, damage-free, and correctly invoiced – once the exception, are now becoming the expectation.” (Bowersox et al., 2010, p. 2).

In contrast to Ballou (2007) and Hesse and Rodrigue (2004), who see the evolution of SCM only from the 2000s, SCM practices are reported, for example, from the fashion industry since the early 1980s. Companies achieved better performance with approaches such as Efficient Consumer Response (ECR) and Quick Response and accomplished a reasonable reduction of supply chain inventory (Lummus et al., 2001). The growth of SCM was also promoted by the spread of best practices among industries and the conviction that early adopters of SCM would dominate the markets in the future (Arend and Wiesner, 2005).

2.1.3 Differentiation between logistics and supply chain management

As discussed in the above paragraph SCM evolved from logistics. In order to define logistics and differentiate it from SCM, first several definitions are compared and then logistics as a discipline is differentiated from SCM.

Bowersox et al., 2010, p.4	“Within a firm's supply chain management, logistics is the work required to move and geographically position inventory. As such, logistics is a subset of and occurs within the broader framework of a supply chain. Logistics is the process that creates value by timing and positioning inventory. Logistics is the combination of a firm's order management, inventory, transportation, warehousing, materials handling and packaging as integrated throughout a facility network. Integrated logistics serves to link and synchronize the overall supply chain as a continuous process and is essential for effective supply chain connectivity.”
Halley and Guilhon, 1997, p. 475	“Logistics, defined as the technology for controlling physical flows and information flows, (...).”
Lummus, 2001, p. 431	“The logistics profession involves planning, implementing and controlling efficient, effective flow and storage of goods and services from the beginning point of external origin to the company and from the company to the point of consumption for the purpose of conforming to customer requirements. Logistics is generally viewed as within one company, although it manages flows between the company and its suppliers and customers.”
Rushton et al., 2009, p. 4	“There is, realistically, no 'true' name or 'true' definition that should be pedantically applied, because products differ, companies differ and systems differ. (...) Logistics = Supply + materials management + Distribution.”

Table 2 Definitions of logistics

The above definitions largely agree that logistics is concerned with the physical movement of goods within the supply chains. However, the definitions partly overlap

with the definitions of SCM (see Table 1), when it comes to the management of materials and information flows. This can be explained by the fact that SCM emerged from logistics and that the two concepts used to be and still are closely interlinked as research by Larson and Halldorsson (2004) shows.

Overall, the definitions above and discussions in academia show that the differentiation between logistics and SCM is not clear-cut in all cases (Lummus, 2001). Among academia and management there are "Traditionalists" (SCM is part of logistics), "Re-labelling" (logistics is now called SCM), "Unionists" (logistics is part of SCM) and "Intersectionists" (logistics and SCM overlap) (Larson and Halldorsson, 2004). For the purpose of this paper the Unionist view on logistics is taken, where logistics is a supporting function for SCM.

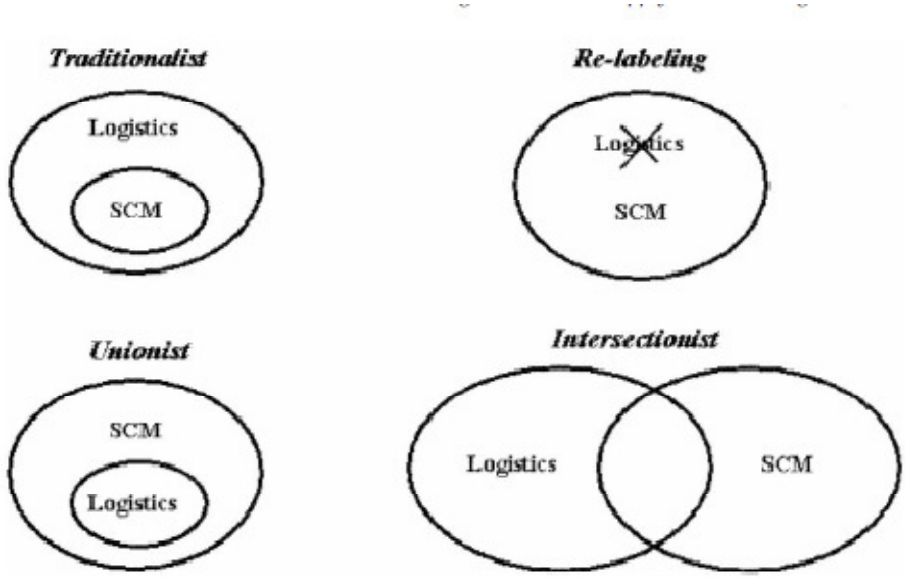

Figure 4 Perspective on logistics versus supply chain management

(Larson and Halldorsson, 2004, p. 19)

From section 2.1.2 Evolution of logistics and supply chain management, it becomes obvious, that SCM, as such, is still a young "discipline" and there are debates concerning whether SCM can be classified as a discipline. Therefore, it does not surprise that it is not yet mature. As a result, definitions of SCM and differentiation from logistics are not clear-cut but, as with every young discipline, maturity should be achieved over time.

2.1.4 Comparison of operations and supply chain management and the significance of supply chain strategy

Since operations management appears to be an established function and SCM is a fairly young concept, the following paragraph aims at describing the position of SCM and

operations management and their interaction in a company. This paragraph also discusses how supply chain strategy can contribute to the success of SCM.

"What is operations and process management? The Operations function is the part of the organization that produces products or services. (...)'Operations' is not always called by that name, but whatever its name, it is always concerned with managing the core purpose of the business - producing some mix of products and services. Processes also produce products and services, but on a smaller scale. They are the component parts of operations, but other functions also have processes that need managing. In fact every part of any business is concerned with managing processes." (Slack et al., 2009, p. 2).

From this definition it can be extracted that operations is concerned with managing the core purpose of the business, which ultimately produces the company's products or services. Conversely, looking at Porter's Value Chain, operations here is only one of several other functions, such as logistics and marketing and sales which produce value for the customer and, ultimately, contribute to the profit of a company.

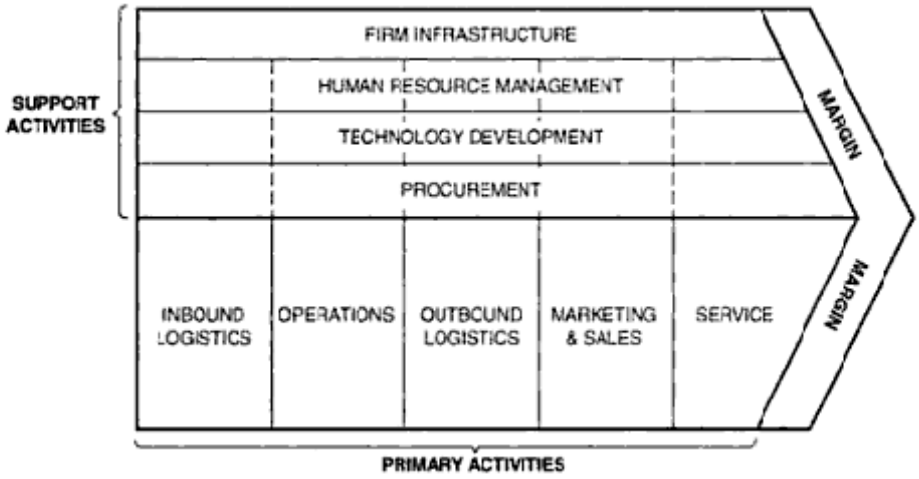

Figure 5 Porter's value chain

(Barnes, 2001, p. 52)

So, how do SCM and operations management match and cooperate or complement each other as business functions? From the definitions of SCM in section 2.1.1 Definition of supply chain management, it becomes obvious that SCM as a discipline is less tangible than, for example, operations management or marketing. It appears to be an almost overarching function, coordinating information and material flows within a company but also up and down a supply chain, taking into consideration concepts such as collaboration and relationship management. SCM is not a clear-cut function as it is a "melding of logistics (i.e. distribution and production), procurement, industrial organization economics, marketing and strategy" (Arend and Wiesner, 2005, p. 407). Moreover, the majority of benefits of SCM for a firm do not come into effect

immediately, they emerge over time. The above paragraph shows, that the boundaries of operations and SCM can be blurred depending on the definition, since SCM is tasked with managing the materials and information flow it also could touch on or influence operations somehow. Nevertheless, the functions can be differentiated by their core competencies which include production of goods or services for operations and management of flow and information for SCM.

SCM and strategy appear to be closely linked with each other. This also becomes obvious from the SCM definitions, which emphasise the importance of a strategic or long-term perspective of SCM (Table 1). “By linking supply chain objectives to company strategy, decisions can be made between competing demands on the supply chain” (Lummus and Vokurka, 1999, p. 11).Strategy is defined as follows: “Strategy is about planning as distinct from doing. It is about formulating a long-term plan for the supply chain, as distinct from solving the day-to-day issues and problems that inevitably occur” (Harrison and van Hoek, 2008, p. 28); or as Porter (1996, p. 78) differentiates strategy from operations “Improving operational effectiveness is a necessary part of management, but it is not strategy”. In addition it is suggested, that the exchange between SCM and strategy development could complement and enrich each other. “SCM offers to strategic management a new level of analysis and possibly a new type of organization” (Ketchen and Giunipero, 2004, p. 51).

It is advised to have a supply chain strategy in place, which refers to the overall strategy of a company (Schnetzler et al., 2007). So, what is supply chain strategy? “Supply strategy relates to the integration of supply activities within firms, in dyadic relationships, in chains of firms and in inter-organisational networks. These have been expressed as different systems levels of supply (...). Common to all these levels of supply is the flow of supply and the activities and decisions associated with that flow” (Harland et al., 1999, p. 663).It needs to be added that Harland et al. (1999) see supply chain strategy as a broader concept than supply chain management and by adapting the name to supply strategy they want to differentiate supply chain management from supply (chain) strategy. Schnetzler et al. (2007, p. 25) define “(...) supply chain strategy as a set of prioritized SCM objectives i.e. strategic priorities, and a way to operationalize them, i.e., to determine appropriate measures, in order to build up and capitalize on so-called logistics success potentials that can potentially result in successful business performance.” And finally “A supply chain strategy is a channel and business organizational arrangement based on acknowledged dependency and collaboration. Supply chain operations require managerial processes that span functional

areas within individual firms and link suppliers, trading partners, and customers across organizational boundaries" (Bowersox et al., 2010, p. 4). In summary supply chain strategy is the long-term planning, which is concerned with the development, coordination and holistic execution of activities and flows within a company and across companies in order to enhance business performance.

2.1.5 Supply chain integration and business processes

As the definitions in section 2.1.1 Definition of supply chain management, point out, SCM is about a holistic approach and managing processes within the supply chain in order to achieve the seamless flow of information and material. Traditionally, companies have been organized in functions. Integration aims at overcoming the functional thinking in organizations in order to facilitate information and material flow. If companies are organized vertically or act in so-called silos (Zhao et al., 2010), staff tend to concentrate only on their own work, without looking left or right and not noticing or knowing what the other departments are doing (Figure 7).

It is accepted that internal integration facilitates external integration (Das et al., 2006; Flynn et. al., 2010; Frohlich, 2002; Koh et al., 2006; Stank et al., 2001; Zhao et al., 2010) and internal integration is the basis for external integration (Arlbjørn et al., 2007; Flynn et al., 2010) (Figure 8).

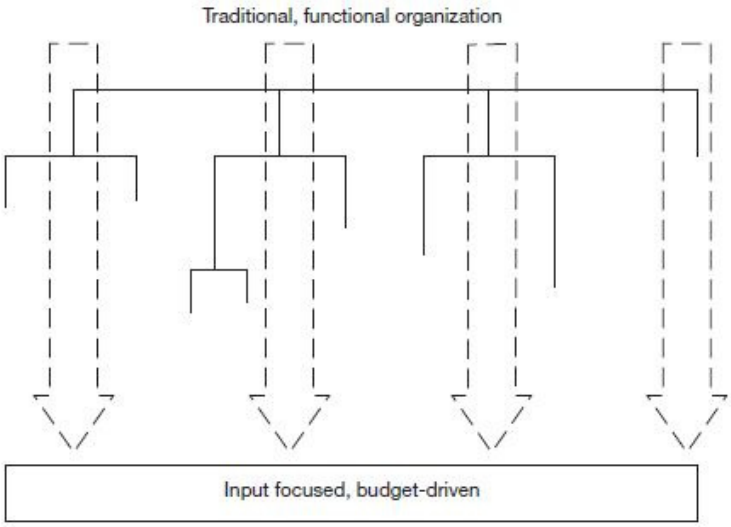

Figure 6 Vertical organizational focus

(Christopher, 2005, p. 26)

Vertical organization is nourished by fragmented planning systems and performance objectives which are individually set by departments (Richey et al., 2009). Vertical organization causes ineffective and inefficient information processes and communications which results, for example in duplicated efforts, processing delays,

misdirected information and physical and cultural barriers between departments (Mangan et al., 2008).

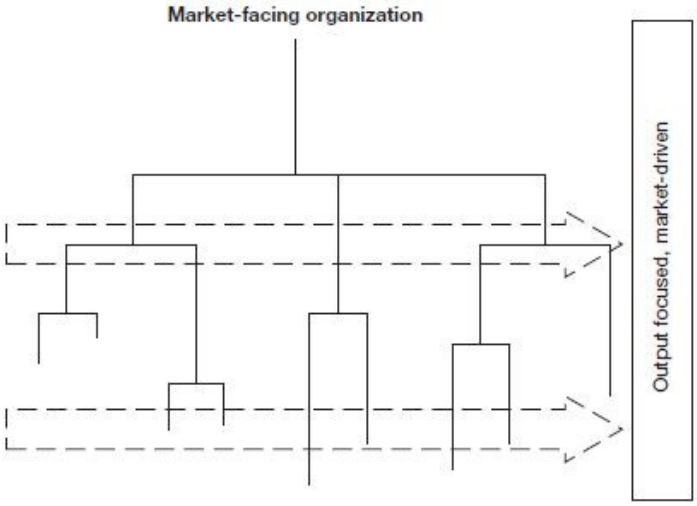

Figure 7 Horizontal organizational focus

(Christopher, 2005, p. 269)

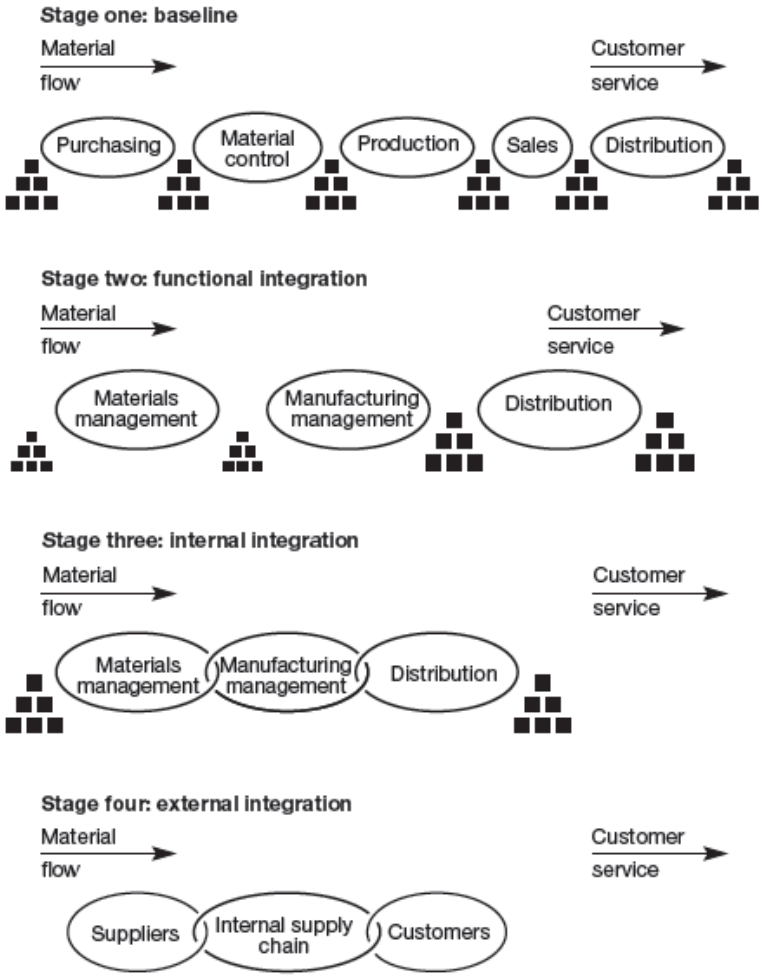

Figure 8 Supply chain integration

(Stevens, 1989, p. 7)

Supply chain integration interlinks two or several parties in a supply chain in order to support and even improve the efforts of supply chain management, as depicted in Figure 8.

It starts internally by integrating functions within a company, which results in close collaboration between departments as shown in stage three in Figure 8. The final step (stage four) is external integration which aims at close collaboration with suppliers and customers. However, before a company engages in relationships with external partners in the supply chain, the internal conditions should first be set (Kotzab et al., 2011).

For the purpose of this thesis the definition of Vijayasarathy (2010, p. 1) is chosen: "Integration is defined as the merging of parts into a whole, and supply chain integration, at its normative ideal, refers to the adoption and use of collaborative and coordinating structures, processes, technologies and practices among supply chain partners for building and maintaining a seamless conduit for the precise and timely flow of information, materials and finished goods."

In order to achieve internal integration, horizontal integration of the various functions in an organization has to take place. To fulfil this goal, key business processes, which should be managed by cross-functional teams, should be established and performance measurement for functional managers should be modified. The functional teams should have and give equal access to ideas, information and resources. The organization should be understood as a whole and, therefore, all major steps pursued jointly: planning to anticipate and solve operative issues, formulation of objectives and goals, allocation of responsibilities and decision making regarding cost efficiencies (Giminez, 2006) (Figure 7).

In order to achieve internal integration business process reengineering (BPR) can be used. BPR is a tool for dismantling and then redefining critical business processes in an organization (Hammer and Champy, 2008). "Process management changes the firm's emphasis from functional performance to process performance, based on cross-functional performance criteria related to strategic objectives and customer requirements" (Lockamy III and Smithy, 1997, p. 143). BPR helps to remove non-value adding activities and supports coordination needs, the standardization and simplification of business processes and better visibility on costs, order and supply plans (Arlbjørn et al., 2007).

The facilitator for internal integration is information technology. By installing an enterprise resource planning (ERP) system, which links all functions and processes in a company, data and information can be exchanged easily (Zhao et al., 2010).

Consequently, timely and accurate information can be received, which creates transparency and supports decisions efficiently and effectively (Arlbjørn et al., 2007; Stank et al., 2001). Moreover ERP leverages SCM competencies for operational, strategic and managerial aspects. It is advised to implement ERP first in order to support SCM implementation (Su and Yang, 2010).

In conclusion, it should be noticed that supply chain management is the actual management and coordination of the supply chain as a whole; whereas, supply chain integration interlinks members of the supply chain in order to support and improve supply chain management. Supply chain integration can be seen as an enabler of supply chain management. "Integration is now widely considered the core of successful supply chain management both among academics and practitioners; because the implementation of supply chain management needs the integration of processes from sourcing, to manufacturing, and to distribution across the supply chain" (Richey et al., 2009, p. 827).

2.1.6 Supply chain management practices and adaption in large enterprises

An array of SCM practices are widely discussed and accepted as best practices in academic literature as listed below in Table 3.

- Quick Response
- Efficient Consumer Response (ECR)
- Just-in-Time (JIT)
- Centralized transportation and logistics
- Distribution requirements planning
- Information sharing and electronic data interchange (EDI)
- Market segmentation
- Product differentiation
- Demand management
- Vendor-Managed-Inventory (VMI)
- Collaboration and partnering
- Supplier relationship management
- Lead-time management
- Lean and agile
- Postponement
- Mass customization
- Supply chain synchronization
- Risk management
- Continuous improvement
- Process mapping and waste removal
- Distribution and logistics

Table 3 SCM best practices

(Christopher, 2005; Croom et al., 2000; Lummus et al., 1999; Lummus et al., 2001; Storey et al. , 2006; Wong et al., 2005)

However Storey et al. (2006) argue that the real business world lags behind academia. They state that companies are not simply involved in SCM, managers are insecure choosing the appropriate SCM practice for their supply chain and SCM at its best is used internally. “Supply chain theory would suggest that the supply chain should be managed from end-to-end. Our research found very few examples of this, but it did illuminate the barriers to its practice. (...) Management of the supply chain was analogous to a relay race, with responsibility being passed from one company of actors to another, as illustrated by the array of management mechanisms found. (...) One central challenge is to the very idea of "managing" the supply chain. (...) Arguably one ideal would be a separate function independent of the existing array of functions which are partially but not fully involved. Such a developed function might act as the arbitrator of supply and demand” (Storey et al., 2006, p. 769). Also, Bagchi et al. (2005) report that companies only start to cooperate with other companies and they seem to be reluctant to share information in the supply chain. Recent supply chain diagnostics research showed that among 72 companies in the UK, New Zealand and Thailand only a very few were well integrated. The majority of companies seem to struggle to implement internal integration as well as integration with external supply chain partners (Childerhouse et al., 2011). Moreover Fabbe-Costes and Jahre (2008) question the widely held assumption that SCM and integration is positively related to a company’s performance.

2.2 Supply chain management in small and medium-sized enterprises

The European Commission defines micro, small and medium-sized enterprises by the number of employees and turnover or balance sheet total (in €).

Company category	Employees	Turnover	Balance sheet total
Medium-sized	< 250	≤ € 50 m	≤ € 43 m
Small	< 50	≤ € 10 m	≤ € 10 m
Micro	< 10	≤ € 2 m	≤ € 2 m

Table 4 Ceilings for SME definition

(The European Commission, 2011)

For this thesis only small and medium-sized companies are considered. The economic importance of SMEs is astonishing. “What usually gets lost is that more than 99% of all European businesses are, in fact, SMEs (...). They provide two out of three of the private sector jobs and contribute to more than half of the total value-added created by businesses in the EU. Moreover, SMEs are the true back-bone of the European

economy, being primarily responsible for wealth and economic growth, next to their key role in innovation and R&D" (The European Commission, 2011). This fact is also reflected in the term "Hidden Champions", which is occasionally used to classify SMEs (Simon, 1992). The economic importance of SMEs is accepted by several authors in academia (Koh et al., 2007; Singh, 2011).

Despite this, the amount of academic literature about SMEs particularly in the area of SCM in SMEs is limited (Brau et al., 2007; Koh et al., 2007, Morrissey and Pittaway, 2004a; Quayle, 2003; Töyli et al., 2008). It has been acknowledged, that SMEs are heterogeneous, for example, they could be family-owned or could have been found just recently (Arend and Wiesner, 2005; Emiliani, 2000; Morrissey and Pittaway, 2004b).

Several authors point out that theories tested in large enterprises (LE) might not be applicable for SMEs (Fernandes et al., 2006; Halley and Guilhon, 1997; Julien, 1995; Morrissey and Pittaway, 2004a; Mudambi and Schründer, 1996; Towers and Burnes, 2008). Despite this, there are papers, which base their research about SMEs on knowledge about LEs (for example Pressey et al., 2009; Shokri et al., 2009). As stated in the research aims in the introduction, this thesis aims at using, primarily, literature about SMEs as a basis for research.

This part of the literature review looks at general characteristics of SMEs. Moreover, the aspects management, operations, strategy, SMEs' position in the supply chain towards suppliers and customers, supply chain integration and information technology are enlightened using definitions from the first part of this literature review as a basis. By reviewing these aspects, the current state of supply chain management in SMEs will be evaluated. Based on this evaluation section 2.4.1 Supply chain management and small and medium-sized enterprises - is there a need for a new definition?, will elaborate on whether the definition of supply chain management as in section 2.1.1 Definition of supply chain management, only suits LEs or is also applicable for SMEs.

2.2.1 General characteristics, management and operations

First, the general characteristics of SMEs will be discussed looking at aspects such as the macroeconomic context, resources and finance. Then, the role of the head of a SME, management and operations in SMEs will be examined. Finally, this section concludes with the implications from management for SCM in SMEs.

In a macroeconomic context it is reported that SMEs operate in fragmented or commoditized industries (Arend and Wiesner, 2005). They also tend to confine their business to a distinct region (Brau et al., 2007; Malhotra and Temponi, 2010). SMEs

stand out through their technological and innovation capabilities and they prefer to concentrate on core competencies through specialization. As a result their range of products tends to be small. Nevertheless, they act as suppliers, customers or distributors in the supply chain (Arend and Wiesner, 2005; Koh and et al., 2007; Thakkar et al., 2008a; Thakkar et al., 2009a). SMEs try to cover niches in order to secure a lucrative position in the market (Hong and Jeong, 2006; Malhotra and Temponi, 2010). Due to the above aspects, economies of scale do not play a major role for them (El-Namaki, 1990). Since they need to defend the niches they cover, they rely on themselves and avoid competitors (Arend and Wiesner, 2005). SMEs appear to be more exposed to their macroeconomic environment as a result of their size. For example, changes in competition and regulations and mergers and acquisitions can be a threat to their existence (Arend and Wiesner, 2005; Malhotra and Temponi, 2010).

SMEs have to deal with two major constraints related to resources and funds (Isaksson and Garvare, 2003), which is also reflected in the SMEs' culture (Arend and Wiesner, 2005; Larson et al., 2005; Töyli, et al.,2008). The two major constraints of SMEs lead to further disadvantages for SMEs and, in addition, there are negative correlations between resource and funds, which will be discussed in the following paragraph.

Since SMEs operate regionally and tend to be based in small communities, they have a limited choice of human resource and talented young graduates. The regional approach might keep expenses low but, at the same time, this results in a deprivation of human resource and talent. At the same time, SMEs lack the funds or are not willing to pay the remuneration graduates demand (Holden and Jameson, 2002). Moreover, it is also reported that SMEs suffer from high staff turnover, which aggravates the situation in human resource (Huin et al., 2002; Malhotra and Temponi, 2010). The constraint of human resources leads to further disadvantages. On the one hand this cuts SMEs off from access to fresh knowledge (Malhotra and Temponi, 2010). On the other hand a low number of staff means that less people have to do more with less time to spare (Higginson and Alam, 1997).

SMEs also face a difficult financial situation. Due to their small size and a difficult macroeconomic environment, financial institutions are reluctant to lend money to SMEs. Financial institutions associate a higher risk with SMEs; as a result SMEs have to pay high interest rates for business loans. In addition they have limited access to other financial resources. Due to this situation, a slow paying morale demonstrated by customers (cash-to-cash cycle) and high transaction costs, SMEs have to operate with tight budgets. As a result they are very cash focused (Arend and Wiesner, 2005; Brau et

al., 2007; Larson et al., 2005; Soinio et al., 2012). Overall this leads to a weak financial situation (Mudambi and Schründer1996). It can be concluded that the weak financial situation is a clear disadvantage for SMEs and it affects a SME's ability to invest in areas such as human resource and resources in general, such as technology or assets.

As discussed in the first part of this literature review the following definition is used as a basis to study the state of operations in SMEs. " 'Operations' is not always called by that name, but whatever its name, it is always concerned with managing the core purpose of the business - producing some mix of products and services"(Slack et al., 2009, p. 2).

The backbone of companies' operations, usually, is management. Therefore, first the significance of management in a SME will be discussed. The characteristics of the management in SMEs are different to LEs and need to be viewed from a different angle, as SMEs look back at different experiences in their past and they have different stakeholders (Beaver and Prince, 2004; Emiliani, 2000).

In a SME the owner, managing director or partner (in the following head of the SME) plays a crucial role. Aspects such as planning, organizing, controlling and monitoring are very much influenced by the personality, beliefs, attitude and experience of the head of the SME (El-Namaki, 1990; Morrissey and Pittaway, 2004a; Thakkar et al., 2008a). It is important for him or her to be appreciated and respected for their position in the firm (El-Namaki, 1990). It is also reported that the head can be very focused on control, which leads to dominance of and accordingly submission of the remaining management. Moreover the head often makes key decisions for minor aspects and is even responsible for operational aspects of the business (El-Namaki, 1990; Huin et al., 2002). This leaves an imbalance between autonomy and collaboration with the remaining management in the firm (Morrissey and Pittaway, 2004a). However, it is also reported that there are heads who practice a participatory management style (Thakkar et al., 2008a). Furthermore it is reported that structured working and a structured approach to decision-making is not appreciated by the head of a SME. This leaves the company in a semi-structured state with low hierarchies (El-Namaki, 1990; Huin et al., 2002; Hong and Jeong, 2006; Thakkar et al., 2008a). Literature also reports that heads of SMEs tend to mistrust their environment; therefore, they observe their environment constantly (El-Namaki, 1990). This might also explain their need for control. Nevertheless they have a distinct ability to build relationships and, therefore, add value to the company (Morrissey and Pittaway, 2004a).

The managers (in the following managers or management of the SME) working for the head of an SME are described as talented and passionate (Brau et. al., 2007). It is stated that the educational background of SME managers impacts various areas of a business: the relationship with suppliers and customers, the business focus, the culture and long-term strategic business decisions (Thakkar, 2008a). Since the management force in a SME is small and they do not have deputy or expert support, the manager in a SME, ideally, should have diversified knowledge and capabilities (De Haan et al., 2007). As described earlier, SMEs operate under financial restrictions. This impedes the recruitment of a profound and skilled management base which becomes, apparently, the limited managerial and technical capability of the SME management force (Brau et al., 2007; El-Namaki, 1990; Larson et al., 2005; Mudambi and Schründer, 1996). Moreover, management in SMEs state that they find it hard to stay up-to-date in terms of the latest management literature (Brau et al., 2007). Similarly SMEs need to be aware that the adoption of advanced management practices is essential to survive challenges caused by globalization and volatility of markets (Cagliano et al., 2001).

Huin et al. (2002) point out two types of managers in the SME, the “professional” and the “upgrader”. The professional’s knowledge derives from long lasting “hands-on” experience in a company. Conversely, the upgrader gains management knowledge from academic education. In SMEs which aim to grow, the manager has to be able to adapt the level of knowledge and capability according to the growth rate, in order to be able to keep up (De Haan et al., 2007).As described earlier the head of a SME does not value structure, which becomes obvious in the organizational structure of SMEs. SMEs are characterized by “blurred departmental walls” (Huin et al., 2002 p. 776). Roles tend to be loosely defined and managers can be responsible for more than one department at the same time. This demands from managers that they are multi-tasking and balance possible conflicts of interest between different departments or functions they manage (El-Namaki, 1990; Huin et al., 2002; Pressey et al., 2009). It has also been observed that certain managers can have higher influence than others in the same SME (Huin et al., 2002). In SMEs it is common to tailor job roles to personalities in order to suit the characteristics and structure of a SME (El-Namaki, 1990).Decision-making by SME managers is described as “bounded rational” (Arend and Wiesner, 2005, p. 409) and influenced by personal characteristics, such as the age, level of experience and education (Park and Krishnan, 2001).Due to the SME manager’s closeness to operational tasks and lack of time, fire fighting is part of the day-to-day job (Brau et al., 2007). Despite this aspect SME managers’ communication with their employees is good

and characterized by closeness, even though it is practiced informally (Arend and Wiesner, 2005; Malhotra and Temponi, 2010). In contrast, the relationship with fellow managers is characterized by mistrust and the unwillingness to collaborate. They fear that this could result in a lack of power (Brau et al., 2007).

There are some implications from management in SMEs for SCM which will be elaborated now. It is advised that the characteristics of SMEs in general and of management in particular might make it difficult to work on issues for SCM implementation (El-Namaki, 1990; Park and Krishnan, 2001). Since management, generally, is tight on time, they might not be able to spare time for SCM initiatives. "Some SCM initiatives such as real time updating of databases and more frequent information sharing were seen by managers as adding to an already heavy workload that had resulted from having fewer employees or from giving managers wider responsibilities" (Higginson and Alam, p. 28). In addition, the scarcity of resources in SMEs imposes an obstacle on SCM implementation in SMEs; therefore, SCM initiatives must be planned very carefully and thoroughly with these obstacles in mind (Brau et al., 2007). De Haan et al. (2007) believe, that the most important prerequisites to support management in SMEs for the implementation of SCM is IT as a basis for decision making and information storage, retrieval and exchange. The human factor in implementing SCM in SMEs should not be neglected. Resistance to change must be factored into a project plan for SCM implementation. Management might feel they lack time to implement changes, the organization might not be ready to overcome traditional practices and they are not well equipped in terms of knowledge about SCM, therefore they might not support change initiatives (Brau et al., 2007; Soinio et al., 2012; Quayle, 2003; Thakkar et al., 2008a). Overall the challenge of SCM implementation in SMEs is to respond to what is required in SCM without compromising their desirable attributes (Emiliani, 2000).

According to the above definition, the characteristics of SMEs' operations will now be discussed. In a SME the differentiation between tactical and operational aspects of a business can be vague. As reported earlier it is common practice that the head of a SME is involved in the operational business and decision making on a daily basis, which can complicate the differentiation between tactical and operational business (Huin et al., 2002). It is reported, that this can prevent operations from running smoothly (Thakkar et al., 2008b). Academic papers agree that SMEs are good at developing novel competencies, from which they derive innovation and their core competencies. SMEs are specialized in technology related aspects, producing few products, which are high in

quality, but low in volume (Hong and Jeong, 2006; Arend and Wiesner, 2005). Their operational advantages, however, can be offset by low marketing competencies (Arend and Wiesner, 2005). SMEs' operations and production are classified as very flexible (Huin et al., 2002; Mudambi and Schründer, 1996; Töyli et al., 2008). They aim to serve the customer as quickly as possible. SMEs' flexibility is supported by the fact that managers are responsible for several functions simultaneously as described earlier. Flexibility is also increased through working around defined business processes (Malhotra and Temponi, 2010). Mudambi and Schründer (1996) present examples where LEs try to imitate smaller firms' flexibility by installing small business units, as they see an advantage in the SME business model. The disadvantage of SMEs' flexible way of working is that they tend to be reactive with a limited future perspective (Arend and Wiesner, 2005). Moreover, their operations still rely on paper based transactions (Thakkar et al., 2008a). Cagliano et al. (2001, p. 480) advise that the "traditional technical excellence or operational flexibility of SMEs are no longer sufficient to promise good performance. Instead, SMEs need ever more formalised practices to gain competitive success."

In SMEs planning in general tends to be less structured and they do not rely on IT (Mudambi and Schründer, 1996; Thakkar et al., 2009a). One reason for this might be the lack of adequate personnel as described earlier. If SMEs do not use IT for planning, this inflames areas of operations, such as sourcing of material, new processes and delivery channels (Thakkar, 2009a). Another reason for not implementing IT for operations is the belief that IT does not influence the quality of the products or services produced (Vaaland and Heide, 2007). The state and deployment of IT in SMEs will be discussed in more detail in section 2.2.5 Information technology. As discussed earlier, the head of a SME very much influences the destiny of a SME. This also comprises performance measurement. Performance measurement of SMEs' operations depends on the perception of the head, who uses unclear definitions for performance measurement (Halley and Guilhon, 1997).

Figure 9 summarizes the above discussed aspects concerning general characteristics, management and operations in SMEs. General characteristics are the characteristics which constitute the basis for the conduct of business in SMEs. Management summarizes how the head of a SME and managers behave and describes their way of working. Operations covers the conduct of business on a day to basis in order to produce the product or services a SME offers.

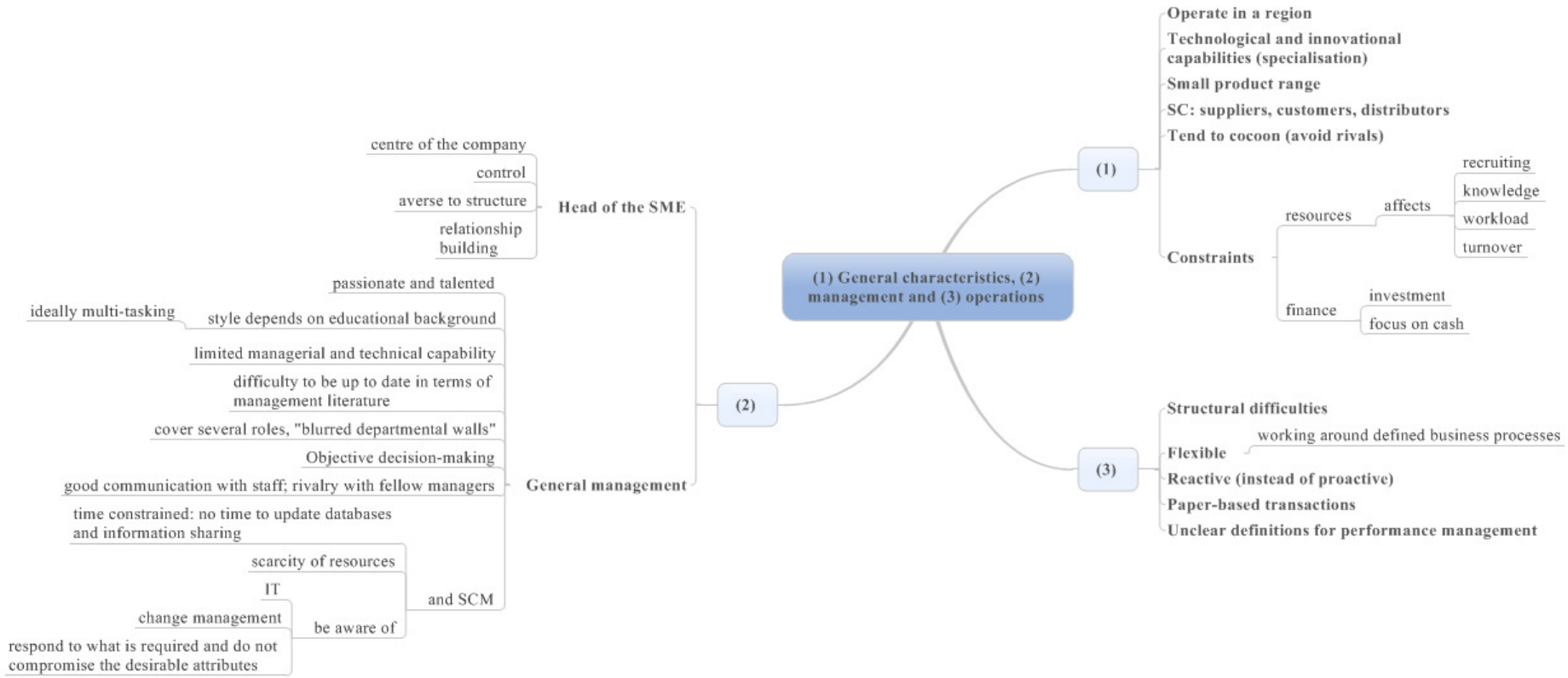

Figure 9 Summary general characteristics, management and operations in SMEs

2.2.2 Strategy

As pointed out in the first part of this literature review strategy is an essential element of supply chain management. Therefore, this paragraph will take a closer look at strategy deployment in SMEs and its implications for supply chain management. For this paragraph the definition in section 2.1.4 Comparison of operations and supply chain management and the significance of supply chain strategy, is used. This definition very much resembles the definition used for SMEs: Strategic planning is defined as, "the devising and formulation of organisational level plans which set the broad and flexible objectives, strategies and policies of a business, driving the organisation towards its vision of the future" (Stonehouse, 2002, p. 854).

Most of the academic literature agrees that SMEs do not have a robust strategy or strategic planning in place (Ahrend and Wiesner, 2005; El-Namaki, 1990; Gunasekaran and Ngai, 2003; Isaksson and Garvare, 2003; Oakes and Lee, 1999; Quayle, 2003; Stonehouse and Pemberton, 2002). On the contrary Beaver and Prince (2004) suggest that strategy development in SMEs is existent but is much more “informal, intuitive and invisible” (p. 34).

As with many other things in a SME, strategy development depends on the head. Strategy development is influenced by the head’s view on macroeconomic issues and past experiences (Ahrend and Wiesner, 2005; Halley and Guilhon, 1997; Thakkar et al., 2008b). It is the head who decides whether the SME is pursuing a proactive or reactive strategy (Halley and Guilhon, 1997). SMEs’ heads can have an impulsive character, which contradicts a strategic notion (Beaver and Prince, 2004). As discussed earlier, SMEs concentrate heavily on cash flow, consequently strategy and long-term plans play a secondary role (Brau et al., 2007; Thakkar et al., 2008b; Gunasekaran and Ngai, 2003; Larson et al., 2005). Stonehouse and Pemberton (2002) class SMEs’ planning efforts as business planning rather than strategy development. They suggest that the lack of strategic planning might be caused by lack of awareness of strategic tools and instruments for strategic analysis. SMEs know that they should change in terms of strategy deployment but they lack the vision and culture to make change happen (Oakes and Lee, 1999). A visionary view could prevent SMEs from implementing change in an unsystematic fashion and also support a positive notion on change (Oakes and Lee, 1999). In addition a lack of time for management activities might impede strategic planning (Brau et al., 2007).

There are several reasons why SMEs should adapt strategy. First, a positive interdependence between the performance of a SME and strategy development has been proven and strategy development also reduces failure rates and enhances organizational learning (Stonehouse and Pemberton, 2002). Moreover, SMEs need to be firm in strategy development in order to be able to market themselves, which can ultimately result in a higher awareness of the importance of IT deployment, quality control and customer focus (Park and Krishnan, 2001). Strategy development also fortifies the position of a SME in an international context, which is inevitable in an era of globalization (Knight, 2001).

In the literature, strategy is also discussed in the light of SMEs' plans for growth. It is in the nature of SMEs that growth is an option in order to increase sales and market share. Strategy is described as a success factor for growth (Sharma and Bhagwat, 2006). In order to grow sustainably and achieve absolute growth rates a strategy should be developed (O' Gorman, 2001). SMEs should also have a long-term plan in place in order to reorganize the company structure during or after a growth phase; otherwise they might suffer from "growing pains", which causes that "employees are overburdened and not well led, work is lagging behind and management improvises rather than plans" (De Haan et al., 2007, p. 119).

In general, strategy development for SCM does not seem to be a common practice in SMEs (Oakes and Lee, 1999). In a survey conducted by Quayle (2003) it was revealed, that only 25 percent of the companies participating in the survey have a strategy for SCM. As discussed earlier, SMEs often focus on the short-term cash flow and operate less with long-term plans. On the contrary financial quick wins can rarely be made with SCM (Brau et al., 2007). SCM strategy development can enhance performance significantly; nevertheless for SMEs it is advised to take "the techno-organizational form, learning and the owner-manager's management style" into consideration (Halley and Guilhon, 1997, p. 492). Usually, an overall strategic decision is made first which is then taken over by different functions within a firm, such as SCM (De Haan et al., 2007). Depending on the strategic focus (either low cost or added value) and the chain relationship position (either low or high) Hong and Jeong (2006) suggest four options for SMEs' supply chain strategy. Firms are advised to choose efficiency, collaboration, coordination or innovation (Figure 10).

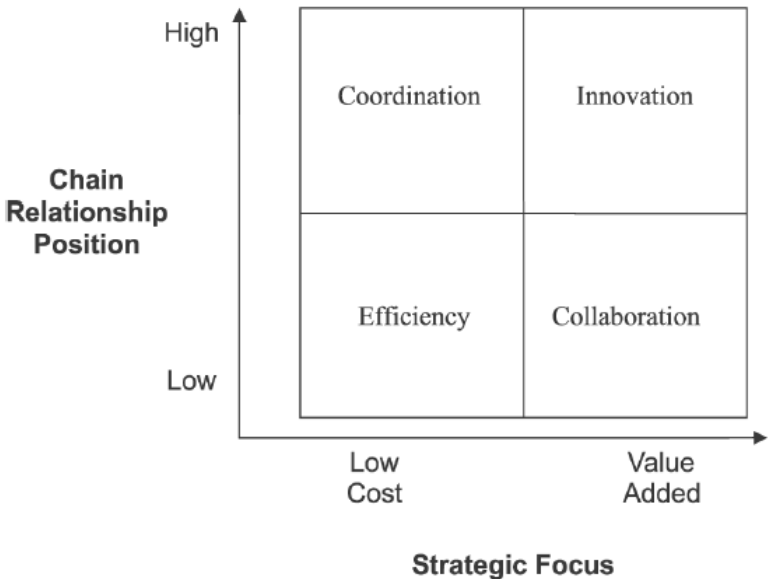

Figure 10 Strategic focus for SCM in SMEs

(Hong and Jeong, 2006, p. 296)

Figure 11 summarizes the aspects concerning strategy in SMEs as discussed in the above section. It should be noted, that strategy deployment in SMEs appears not to be distinctive and, as a result, also no strategy for SCM is in place. If strategy is implemented it seems to be directed and devised by the head of the SME. Weak strategy deployment, mainly, can be caused by lack of awareness on how to design a strategy but also by lack of awareness of the positive effects on performance.

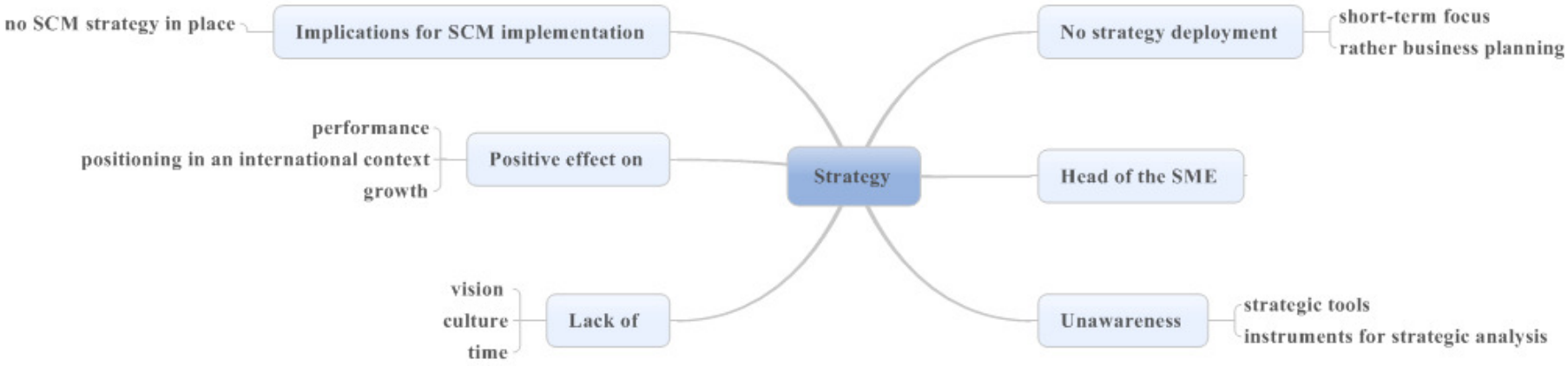

Figure 11 Summary strategy in SMEs

2.2.3 Suppliers and customers

This section of the thesis looks at the roles SMEs play in the supply chain as customers as well as suppliers.

As pointed out earlier, SMEs in general are not homogeneous (Pressey et al., 2009), which means, that there is no "one-size-fits-all" approach for SMEs. For example, in terms of size, turnover or sector there can be substantial differences between SMEs. As a result relationships with suppliers as well as with customers can vary significantly. SMEs act as suppliers to large, globally operating blue chip companies or to other SMEs. Equally SMEs can be customers of large corporations or SMEs. Both scenarios are applicable to the same industry or different industries.

This section looks at SMEs in the role of customers interacting with their suppliers. For this purpose the following paragraphs look at purchasing in SMEs in general, supplier evaluation and selection and supplier relationship management. As with the literature about SMEs in general, academics researching purchasing in SMEs criticize that literature is not comprehensive and literature about LEs has been used as a background for research concerning purchasing practices in SMEs (Morrissey and Pittaway, 2004a; Morrissey and Pittaway, 2004b; Pressey et al., 2009).

Purchasing in general does not seem to be important to SMEs, which is reflected in the fact, that few SMEs have a designated purchasing function in place (Quayle, 2002). SMEs tend not to have a large number of suppliers and therefore, they might not see the necessity for a purchasing function (Thakkar et al., 2008b). In contrast Morrissey and Pittaway (2004b) report that the recognition of purchasing as an important management function has increased. Purchasing, if well managed, can have a positive influence on the profitability of the business (Quayle, 2002). However, SMEs have a disadvantage in terms of their purchasing power. Since they tend to buy smaller quantities, they cannot make use of the principle of economies of scale in purchasing (Töyli et al., 2008).

Purchasing practices vary among SMEs and depend on the size and sector in which the SME is operating. Nevertheless purchasing practices are classified as successful, but different from what has been termed "best practice" in the literature so far (Morrissey and Pittaway, 2004b; Pressey et al., 2009). In SMEs either the head or an employed buyer represents the purchasing function. Considering the importance of the head of a SME as described earlier (section 2.2.1 General characteristics, management and operations) and the fact, that in many SMEs there is no clearly defined purchasing function, it is not surprising that the head of a SME governs purchasing considerably,

especially if he or she is the owner of the business. Profit maximization of purchasing is not always the head's highest priority since they also have personal interests in the business, such as, the selling price of the business, especially if they own the business (Morrissey and Pittaway, 2004b). Nevertheless the head of a SME tends to be more price-driven than an employed buyer (Morrissey and Pittaway, 2004a). Pressey et al. (2009) evaluate the importance buyers attribute to supplier capabilities in areas such as production, delivery, process improvement, relational and innovation for SMEs. As a result they differentiate between two types of buyers in SMEs; the holistic purchaser and the process purchaser. The holistic buyer has high expectations in terms of all supplier capabilities evaluated. The process buyer highly emphasises the supplier's capabilities in terms of delivery, e. g. a documented delivery record and flexibility in emergency cases are important.

Approaches such as supplier evaluation, selection, relationship management and integration are often classified as strategic purchasing, which will now be discussed for SMEs. Pressey et al. (2009, p. 221) describe activities such as " (...) producing a long-range purchasing plan, reviewing and adjusting the plan to match corporate strategic plans, deciding on the types of relationships the firm wants with its key suppliers and cooperating with other functions" as strategic purchasing. They see an advantage of strategic purchasing especially for SMEs to improve their weak purchasing power or to gain access to expertise. However, they also acknowledge that supplier relationship management might take place informally and might be unstructured in SMEs.

Supplier evaluation seems to be completed on an improvised basis in SMEs and they rarely seem to have distinct evaluation criteria or a standard form in place (Pressey et al., 2009). It is reported that, especially, growing SMEs only start to question suppliers' performance when growth stagnates. During a growth phase various new suppliers, which seem capable to support the SMEs' growth plans, are added. However, during the growth phase problems with suppliers are disguised. Only when growth stagnates, SMEs start to tackle problems with suppliers (Beekmann and Robinson, 2004). Overall the supplier capabilities which seem to matter most are production or delivery capabilities, little importance is given to whether the supplier can enrich the SME's business with innovation capabilities (Pressey et al., 2009; Quayle, 2002).

Also, supplier selection in SMEs appears to be less developed. Supplier selection is described as myopic and based on objective criteria, which are then used to make a rational decision (Arend and Wiesner, 2005). Supplier selection in SMEs is also influenced by their low volume, limited scope and the industry in which they are

operating (El-Namaki, 1990; Park and Krishnan, 2001). However, there are authors reporting about cases where the importance of the quality of supply and the selection of suppliers is recognized as critical to the business to enhance the quality of the output of the SME (Bordonaba-Juste and Cambra-Fierro, 2009; Koh et al., 2007).

There is evidence that supplier relationship management (SRM) is practised in SMEs and it is also effective (Higginson and Alam, 1997; Hong and Jeong 2006; Morrissey and Pittaway, 2004b; Mudambi and Schründer, 1996). In smaller SMEs SRM is undertaken by the head, whereas in larger SMEs, SRM is attached to a specific role, but still overseen by the head of the company (Morrissey and Pittaway, 2004b). The nature of the relationship is dependent on the head of the SME and the respective person's past experience. As a result, relationships with suppliers can be transactional, at arm's length or collaborative. The relationship can also be determined by the geographical proximity to the SME (Thakkar et al., 2008a). In supplier relationship management trust plays a very important role for the head of a SME (Morrissey and Pittaway, 2004b). It is described, that the amount purchased depends on the perception of the effectiveness of a supplier relationship and whether a supplier is able to offer stable prices, reliable manufacturing and customer service (Beekmann and Robinson, 2004). The advantage of SRM for SMEs is that close collaboration in the form of SRM promotes the effectiveness of a supply chain (Huin et al., 2002). Moreover, a SME can improve their bargaining power through effective supplier relationships (Brau et al., 2007; Holter et al., 2008; Ramsay, 1994). In addition to poor trust, a short term adversarial perspective and a lack of transparency can be an obstacle to SMEs' SRM (Thakkar et al., 2008a; Thakkar et al., 2008b).

The upstream role of SMEs in the supply chain will now be evaluated by looking at the relationship SMEs have with their customers. It is reported, that SMEs tend to have few customers and are often engaged in business to business relationships, rather than having direct contact with consumers (Arend and Wiesner, 2005; Gray, 2002). If SMEs act as suppliers to first tier suppliers they often find themselves dealing with pressure handed down from the customers' customer, (Hong and Jeong, 2006). Often, SMEs deliver on a make-to-order basis, which does not enable them to react to order changes quickly (Singh, 2011). Since SMEs have a small customer base, small changes in the customer base or order number can affect them considerably (Malhotra and Temponi, 2010). Moreover, SMEs' competitiveness very much depends on the performance of their customers (Singh, 2011).

Earlier, it was explained that SMEs are very focused on the cash flow in their business. This also explains why SMEs have a better relationship with their customers than with their suppliers. They are more concerned about turnaround times and quality affecting their customers, than what service they receive from their suppliers. (Higginson and Alam, 1997). The head of an SME plays a prominent role in managing customer relationships, as in every other area of SMEs' operations (Huin et al., 2002). The relationship SMEs have with their customers matters to them and they sustain their customers' trust through good communication and collaboration (Gunasekaran and Ngai, 2003). It is reported, that SMEs' customers select their partners based on their willingness to help in emergencies, dedicated services, willingness to improve quality and their overall attitude towards the business relationship (Thakkar et al., 2008a). Overall, customers are likely to be more powerful than the SME, due to several reasons. SMEs' customers can be a supplier close to a LE or even a LE, which puts them in a better position in the supply chain. SMEs' customers tend to have access to knowledge about and resources for strategic supplier management and exploit the position they gain from the knowledge advantage. SMEs' customers can make use of the power imbalance between them and the SME and dictate the procedures as a result. Therefore, SMEs can feel dominated by their customers. At times more powerful customers force SMEs to participate in SCM (Huin et al., 2009; Thakkar et al., 2008a; Thakkar et al., 2009a). This situation places SMEs in a bad situation for SCM, since they are not able to undertake practices such as demand management or forecasting properly, as powerful customers change their orders regularly (Huin et al., 2009; Thakkar et al., 2008a). Overall, the position of the SME and the power they have directly determines the complexity of a SME's supply chain (Thakkar et al., 2008a). Figure 12summarizes the aspects discussed concerning SMEs' suppliers and customers as discussed in the above section.

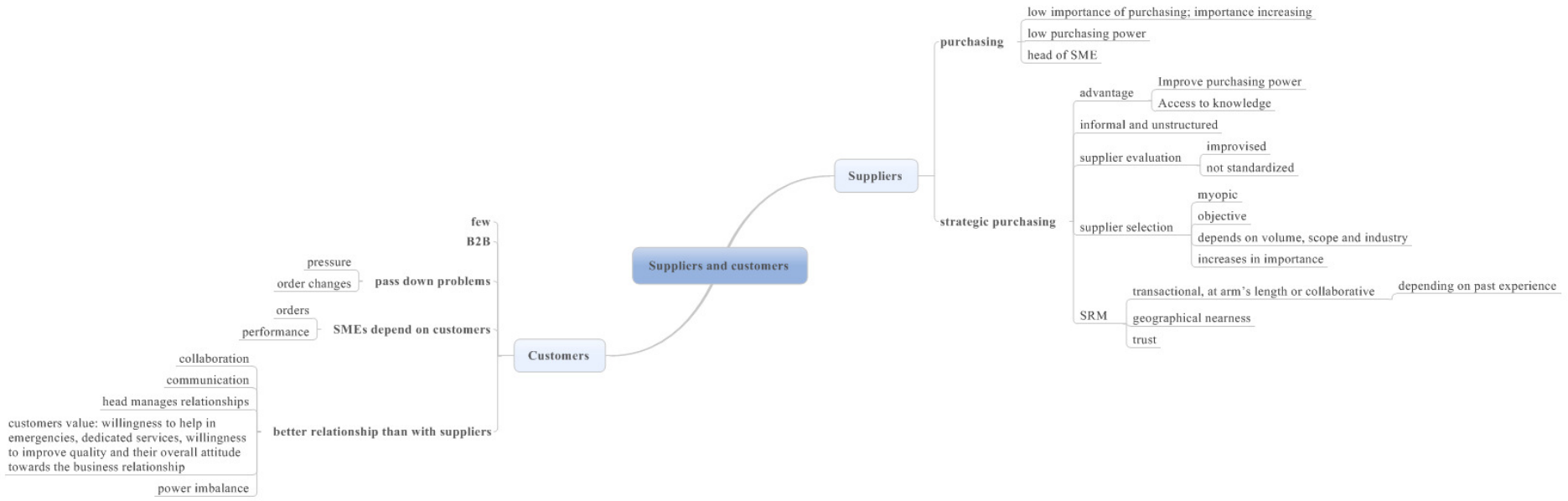

Figure 12 Summary SMEs' suppliers and customers

One particular form of relationship management, which is integration with suppliers and or customers, is discussed in the following section.

2.2.4 Supply chain integration

From Section 2.1.5 Supply chain integration and business processes, "Integration is defined as the merging of parts into a whole, and supply chain integration, at its normative ideal, refers to the adoption and use of collaborative and coordinating structures, processes, technologies and practices among supply chain partners for building and maintaining a seamless conduit for the precise and timely flow of information, materials and finished goods" (Vijayasarathy, 2010, p. 1).

First, this paragraph will discuss supply chain integration for SMEs in general, then it will look at integration with suppliers and customers and, finally, it will conclude by examining the meaning of IT for integration in SMEs.

Even though for this thesis it was set, that integration is a means to SCM there are authors, who see supply chain integration as SCM (Brau et al., 1997; Bowersox et al., 2010; Flynn et al., 2010; Min and Zhou, 2002).

In order to picture the current status and meaning of supply chain integration for SMEs the following topics will be discussed in more depth: empirical support for integration in SMEs, information sharing, how to make integration work, and advantages and disadvantages of supply chain integration for SMEs.

There is empirical support for the existence of integration in SMEs, for example, integration strategy, supply chain alignment and customer integration are discussed in literature (Brau et al., 2007; Chen et al., 2004). Despite that, the firm size influences whether a SME adopts integration (Brau et al., 2007; Mudambi and Schründer, 1996).

Information sharing between SMEs and their partners appears to be limited and seems to be less developed than other SCM techniques such as inventory management, cycle time management and quality assurance. It is reported that sales, shipping and stock data is only shared with partners in the supply chain on demand and generally this is not a common practice (Higginson and Alam, 1997). Nevertheless, if business relationships become complex, partners in the supply chain tend to exchange more information (Welker et al., 2008).

In order to make supply chain integration work it is repeatedly argued that support from a LE is beneficial for SMEs and that SMEs can profit from LEs' knowledge and skills in areas such as business planning and finance (Higginson and Alam, 1997; Mudambi and Schründer, 1996). Ideally the partners involved should retrench their own interests

(such as profit maximization at the expense of other partners in the supply chain or knowledge retention) for the sake of integration. It is unlikely that partners involved completely sacrifice their interests. Therefore, Tuusjärvi and Möller (2009, p. 526) suggest the concept of "norms of moderated autonomy", which enable the partners to safeguard their norms and put necessary boundaries in place to protect them, but at the same time they can make integration work.

There are several disadvantages and advantages concerned with SMEs and integration which will be discussed now.

If SMEs lack the knowledge of how to start an integration project this might hinder them to initiate a project proactively (Barton and Thomas, 2009). Moreover, one important prerequisite for integration is trust. However, it is reported that SMEs lack trust in their partners, which impedes integration. Especially if SMEs deal with more powerful suppliers or customers trust seems to be hindered by the power imbalance. Information exchange appears to be hindered by inadequate communication systems. Moreover, the sharing of confidential information is not welcomed by SMEs and, if done, leaves SMEs with a feeling of vulnerability (Brau et al., 2007; Higginson and Alam, 1997). One reason for the lack of trust is the power imbalance especially between LEs and SMEs and the fact that LEs use their power to cement their position, which erodes SMEs' trust. In this situation SMEs need to trade off between not having supply chain integration as a competitive tool and competing solely on price. Another hurdle for the concept of integration in SMEs is that managers see their companies' performance negatively affected by integration efforts (Brau et al., 2007). SMEs also need to be aware that integration and the resulting SCM efficiencies might make them more attractive for mergers and acquisitions (Thakkar et al., 2008a). It is also argued, that the lack of SCM competencies can lead to a low perception of the benefits of integration and, therefore, to a low organizational readiness (Morrell and Ezingeard, 2002).

Despite all the disadvantages SMEs should not neglect the advantages which integration can bring. Integration appears to come naturally to the head of a SME as they use "social factors in commercial relationships to build trust and manage the relationship" (Morrissey and Pittaway, 2004b, p. 25), which appears to be a solid basis for integration. If SMEs have close relationships with their suppliers or customers, this can result in higher accuracy and reliability of the supply chain (Higginson and Alam, 1997; Huin et al., 2002). Vaaland and Heide (2007) see the building and maintaining of relationships as a competitive advantage for SMEs. Moreover, they have an advantage

towards LEs, which need to step out of their more contract-related and formal culture to make the relational aspects of integration work (Morrissey and Pittaway, 2004b).

Integration can assume different forms and constellations, e.g. integration is practiced with customers, suppliers or 3PLs being either SMEs or LEs (Hong and Jeong, 2006; Mudambi and Schründer, 1996). Companies can integrate with just one partner or with several partners in the supply chain at the same time. The following paragraph will look at suppliers first and customer integration will follow.

Some authors argue that supplier integration is not feasible for SMEs (Arend and Wiesner, 2005; Morrissey and Pittaway, 2004b). Despite this it is reported that there are signs for a partnership approach with suppliers (Mudambi and Schründer, 1996). Supplier integration often seems to be practiced with smaller suppliers (Wagner and Alderdice, 2006). A prerequisite for supplier integration is frequent communication and information exchange, possibly through EDI. The information exchanged can also comprise strategic aspects and information about the market. SMEs tend to engage in supplier integration if they have an interest in the performance of their supplier (Bordonaba-Juste and Cambra-Fierro, 2009; Lajara and Lillo, 2004).

In the literature a number of success factors for supplier integration and the implementation of supplier integration are identified. Supplier integration should be fostered by training through the party which is initiating supplier integration. Additionally there should also be some financial support for larger investments in the relationship (Bordonaba-Juste and Cambra-Fierro, 2009; Larson et al., 2005). The benefits expected from the relationship should be seen with a long-term perspective, otherwise the partners might become de-motivated if the benefits do not become visible immediately (Larson et al., 2005). The implementation of supplier integration is most likely to be successful if the partners are in the same economic situation, if they have common values, if there is mutual trust and innovation and resources are shared (Wynarczyk and Watson, 2005). Supplier integration must be sustained through efficient, regular and comprehensive communication. Communication can be supported and fostered through IT systems, such as EDI (Bordonaba-Juste and Cambra-Fierro, 2009; Larson et al, 2005; Shokri et al., 2010).

There are various advantages of supplier integration for SMEs. First of all supplier integration strengthens the relationship with the supplier (Lajara and Lillo, 2004; Wagner and Alderdice, 2006). Through supplier integration SMEs can gain trust and confidence with their suppliers, which can contribute to a long-standing relationship.

Supplier integration can also have a positive effect on the effectiveness of a supply chain. Through regular exchange of information the information and material flow can be smoothed (Bordonaba-Juste and Cambra-Fierro, 2009; Thakkar et al., 2008a).

Expertise and knowledge of the parties involved in supplier integration can also be improved. Through close collaboration the lack of human resource and managerial knowledge can be compensated (Larson et al., 2005). Moreover integration means access to information and expertise at reasonable cost, which otherwise would not have been accessible. This can be a source for competitive advantage and innovation (Gunasekaran and Ngai, 2003; Higginson and Alam, 1997; Lajara and Lillo, 2004; Wynarczyk and Watson, 2005). Through integration SMEs can gain planning, finance and technical knowledge themselves, which supports the supplier, but also benefits their own business (Lajara and Lillo, 2004; Mudambi and Schründer, 1996).

Exchange of information and knowledge through integration of a supplier also benefits the product offering (Wagner and Alderdice, 2006). It is reported, that through integration suppliers are able to expand their production, increase productivity and improve the quality of products and services (Calabrese, 2000; Lajara and Lillo, 2004; Shokri et al., 2010).

Another advantage of supplier integration is its positive effect on the business' performance, since costs can be reduced (Bordonaba-Juste and Cambra-Fierro, 2009; Shokri et al., 2010; Wagner and Alderdice, 2006; Wynarczyk and Watson, 2005). In addition, supplier integration can benefit SMEs' performance through increased turnover and higher employment, faster market penetration, financial risk sharing and overall high rates of sustained growth (Calabrese, 2000; Larson et al., 2005; Wynarczyk and Watson, 2005).

There are also disadvantages to supplier integration, which will be discussed in the following paragraph. The concept of supplier integration is not yet embedded within SMEs. They still tend to take an adversarial approach to relationship management (Larson et al., 2005; Morrissey and Pittaway, 2004b). If a LE involves or even forces a SME into supplier relationship management it is likely that a power imbalance exists and that there might not be a collaborative approach to the relationship, which also leaves the SME in a worse position when it comes to negotiations and decision making (Arend and Wiesner, 2005; Higginson and Alam, 1997; Larson et al., 2005; Morrissey and Pittaway, 2004b).

Supplier integration cannot flourish if communication is not precise and aims and goals are not shared (Quayle, 2002). If integration means sharing of confidential information,

this might cause information drain (Larson et al., 2005). Furthermore, it is reported that it takes longer for SMEs to build trust, but the integration partner might not have the patience to wait (Mudambi and Schründer, 1996). However, without trust supplier integration is built on a weak foundation. Another disadvantage of supplier integration is, that the partners involved have to make significant financial investments (Arend and Wiesner, 2005; Lajara and Lillo, 2004; Wynarczyk and Watson, 2005). In addition supplier integration can lead to dependence of the partners involved, which over a longer period can impede their performance (Larson et al., 2005).

To overcome disadvantages concerning supplier integration a strategy for supplier integration might be helpful. Hvolby and Trienekens (2002) argue that SMEs should develop a strategy for supply chain integration with suppliers which should take into consideration supplier lead times and the level of customization of products (Figure 13). If the lead times are short and customization is low then integration is not necessary and sourcing on a more transactional basis is sufficient. However the longer the lead times and the higher customizations are, the more integration strategies, such as Vendor Managed Inventory and Advanced Planning systems play a role. Vendor Managed Inventory makes the supplier responsible for supplying the right amount of material at the right point of time. Advanced Planning Systems suggest to plan and replenish with the supplier collaboratively.

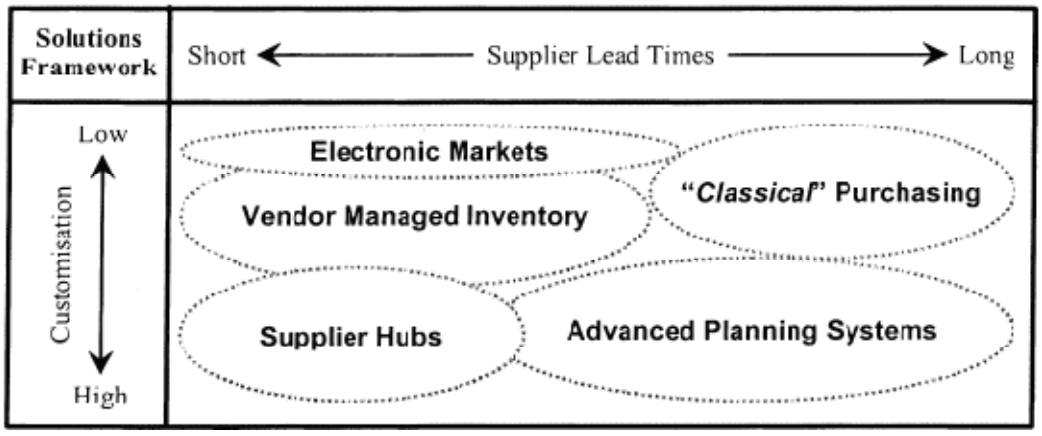

Figure 13 Supply chain planning framework

(Hvolby and Trienekens, 2002, p. 7)

Figure 14 summarizes the aspects discussed concerning supplier integration as in the above paragraph.

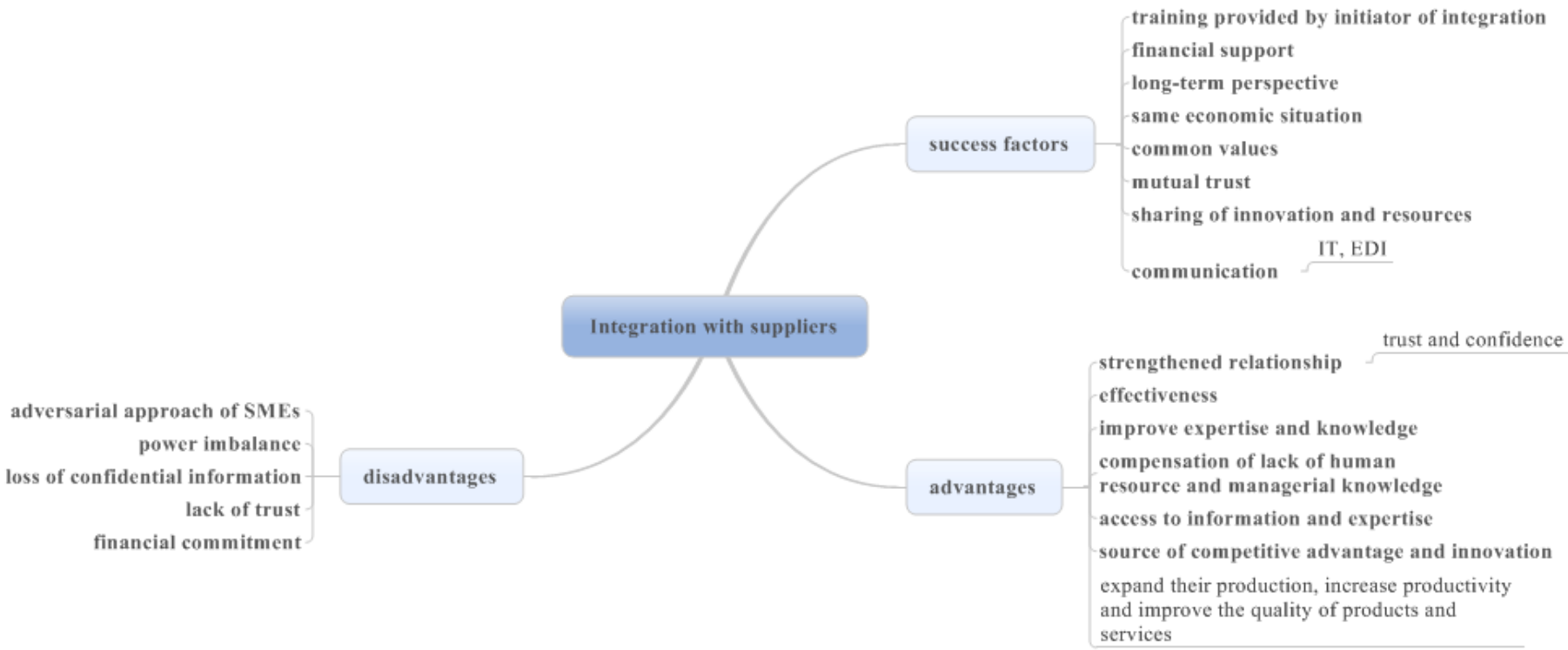

Figure 14 Summary integration with suppliers

SMEs appear to be reluctant or unable to step into integration with their customers. As discussed, SMEs often are governed by larger customers; therefore, they might not trust the larger and more powerful partner. Moreover SMEs do not want to take risks by investing in systems which might be required for integrating with their customers (Larson et al., 2005; Vaaland and Heide, 2007). Emiliani (2000) reports, that integration with customers can work if certain aspects are considered. The customer of a SME should take the feedback given seriously, in order to be able to work on solutions collaboratively. Through this approach they can work on business procedures which add little value and gain buy-in for the integration project. "Large businesses have a challenge to understand the strengths of small businesses and help them improve their weaknesses in a collaborative manner. This type of behaviour is difficult to exhibit by those accustomed to western management practices because it is neither customary nor rewarded by investors. So think of it as a moral imperative instead." (Emiliani, 2000, p. 70). Barringer (1997) suggests several advantages and disadvantages for SMEs engaging in integration with their customers, which are listed in Table 5.

Advantages	Disadvantages
• Creates a long term perception of the relationship • Creates mutual trust • Fosters open communication • Reduction of transaction costs • Enables access to critical resources • Strengthens the customer base	• Loss of autonomy and flexibility • Dependence on the large firm • Weaker negotiation position • Sharing of confidential and other information

Table 5 Advantages and disadvantages of SMEs engaging in integration with their customers (Barringer, 1997)

Among the disadvantages listed above, the one which concerns SMEs the most is dependency on the more powerful supplier. Larson et al. (2005) suggest that SMEs can improve their position through innovation and as a result they can change dependence to interdependence.

It is argued, that integration is supported through information and data exchange through IT systems and ultimately through IT integration. Despite this IT does not seem to be widely adopted for integration (Barton and Thomas, 2009; Brau et al., 2007; Higginson and Alam, 1997; Kim and Junc, 2008; Morrell and Ezingeard, 2002; Mudambi and Schründer, 1996). Instead, it is reported that the fax machine is used to transmit information to external partners which implies that data has to be re-keyed in the partner's system (Higginson and Alam, 1997). The reason for low adoption might be the limited IT knowledge and experience in SMEs and the perceived high expenditure for implementation of IT systems (Barton and Thomas, 2009; Welker et al., 2008).

In fact, there are a number of disadvantages, which might discourage SMEs to implement IT for integration, which will be discussed next.

The shortage of human resource, as discussed in this thesis before, might lead to a bottleneck for IT implementation (Hertz and Bergström, 2003; Bayraktar et al., 2009). Moreover, the skills and capabilities necessary to successfully lead an IT implementation project are not likely to be available in a SME due to an already low number of staff (Bayraktar et al., 2009; Kim et al., 2008). High costs for IT in general are also an impediment for integration (Brau et al., 2007; Kim et al., 2008). SMEs tend to integrate with large customers or suppliers, which leaves them in a weaker position (Hertz and Bergström, 2003; Larson et al., 2005). As a result, SMEs might adopt an IT solution, which has been imposed or proposed by the LE, which might not suit the SME's business or might not be adaptable for integration with other partners in the supply chain. If another partner asks for IT integration, the SME might not be able to invest in another solution (Hertz and Bergström, 2003; Kim et al., 2008). In addition there are more general disadvantages for SMEs in terms of IT for integration. A SME as an organization might not be ready for integration or the head might not champion the integration project. This can lead to resistance among staff. Also the vendor of an IT solution might not support the IT integration project as much as needed by the SME (Bayraktar et al., 2009; Kim et al., 2008).

In contrast to the various disadvantages, integration through IT provides several advantages, too. In order to be able to manage a supply chain efficiently, prompt and precise information and communication is necessary. This can help to create a lean, simplified supply chain with optimized lead-times and reduced costs, which focuses on value creation for the good of the customer (Adewole, 2005). Integration through IT is a chance for SMEs to improve their profile in comparison to competitors and LEs and therefore improve their competitive position (Hertz and Bergström, 2003). Hoyer and Christ (2007) present a holistic analysis framework listing the advantages SMEs can gain through integration in the area of finance, working processes, innovation and learning and as a user (Figure 15).Overall Bayraktar et al. (2009) confirm that the integration through IT benefits a SME's operational performance.

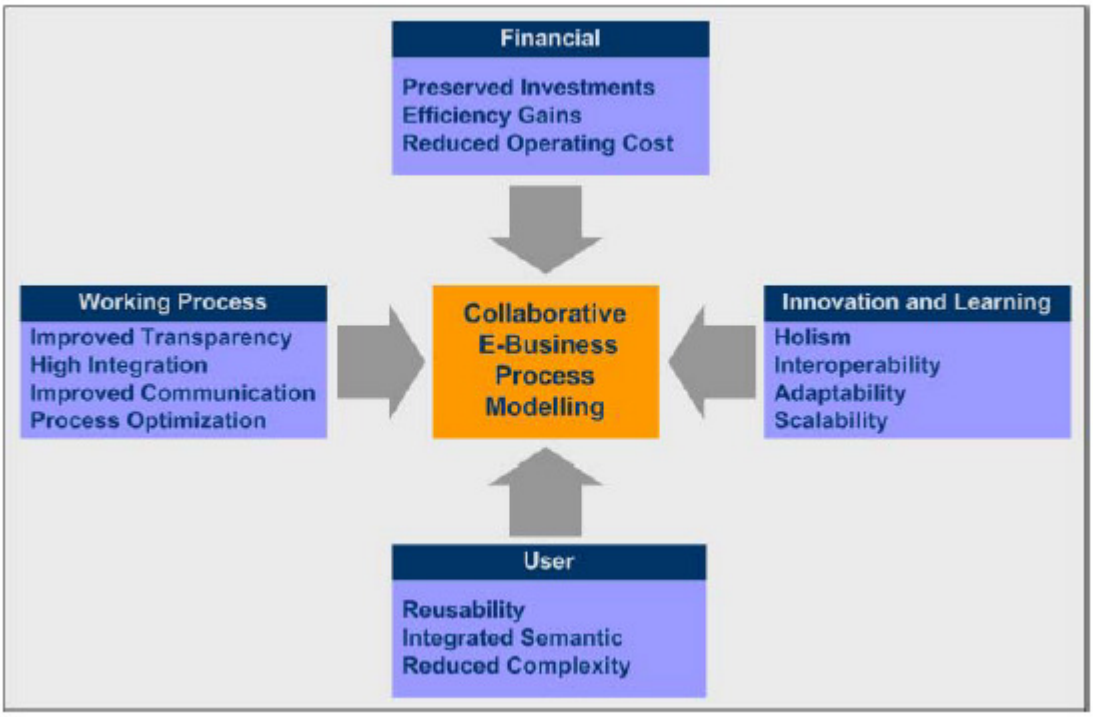

Figure 15 Perspectives of the holistic analysis framework

(Hoyer and Christ, 2007, p. 46)

Considering the constraints SMEs face whilst implementing IT for integration, there are some suggestions in the literature to overcome the stumbling stones of implementation. IT implementation can be achieved in collaboration with other SMEs sharing resources and, therefore, costs can be reduced (Mudambi and Schründer, 1996; Vaaland and Heide, 2007). This could be supported by government bodies or some sort of support services (Wagner et al., 2003). Barton and Thomas (2009) present a comprehensive framework to support the implementation of integration for SMEs, which can help as a guideline and also to estimate risks of such a project (Figure 16).

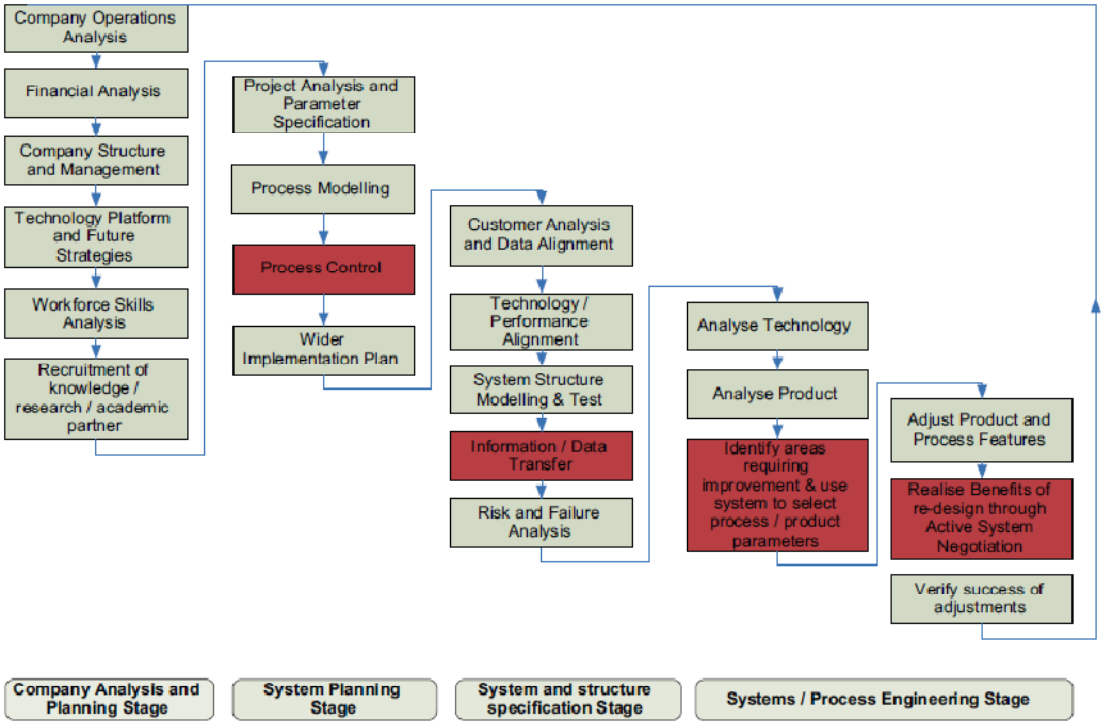

Figure 16 Implementation strategy for integration to a supply chain network

(Barton and Thomas, 2009, p. 937)

Figure 17 summarizes the aspects concerning integration and IT in SMEs as discussed in the above paragraph.

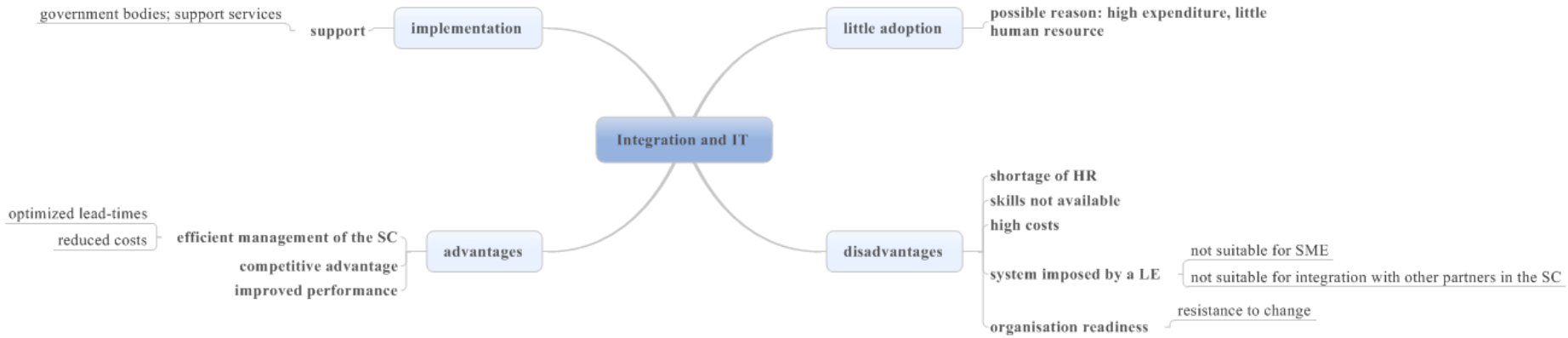

Figure 17 Summary integration in SMEs and IT

2.2.5 Information technology

As described in section2.1.2 Evolution of logistics and supply chain management, IT played a crucial role in the development of logistics and supply chain management. Therefore, this section will look at the current state of IT in SMEs. Moreover it will discuss the risks SMEs face, if they chose not to implement IT and obstacles. Also obstacles and advantages of IT implementation in SMEs and IT solutions for SMEs, which are presented in existing literature, are examined. Finally this section will look at aspects concerning one specific IT solution for companies, which is enterprise resource planning (ERP).

"SCM introduces new challenges in technology management to the SME because it is a much closer and technically intense and complex transaction set than most alternatives are" (Arend and Wiesner, 2005, p. 405). As stated above, IT is essential not just for supply chain management, but for the management of a firm's operations as a whole. If the head of an SME is aware of the necessity of IT for SCM, then this may reflect that he or she is aware of the firm's position and importance in the supply chain (De Haan et al., 2007). Information management comprises several different activities such as "(...) the collecting, processing, retrieving, reporting and storing of data (...)" (Gunasekaran and Ngai, 2003, p. 839). Ultimately if the data available is crunched and management makes sense of the analysis, it can be valuable for measurement and control of the operations performance (Gunasekaran and Ngai, 2003).

Literature shows that SMEs are slow at adapting IT or have not implemented IT (De Haan et al., 2007; El-Namaki, 1990; Gelinas and Bigras, 2004; Gunasekaran and Ngai, 2003; Julien, 1990; Thakkar et al., 2008a; Welker et al., 2008). De Haan et al. (2007) report that IT implementation and usage is often related to the size of the firm and is often limited to administrative and operational tasks. In addition, management rarely uses business intelligence to back up their decisions. If IT is implemented, it often is influenced by competitors who decided to invest in IT earlier (Thakkar et al., 2008).

One reason for the non-adoption of IT is that SMEs prefer to be in direct contact with their customers, rather than communicating via IT (Welker et al., 2008). Another reason could be that SMEs make sense of information in a different way. "They evaluate information by comparing different sources and they use iterative techniques and intuition to complete their information and to decide on their investments" (Julien, 1995, p. 459).

Whatever the reason which makes a SME decide not to adapt IT management, one must be aware that there are risks associated with non-adoption. IT is seen as a source of competitive advantage, for example in the area of management and production technologies. If they do not invest in IT they might lose competitive advantage (Julien, 1995; Vaaland and Heide, 2007). Moreover SMEs might not be able to participate in SCM initiatives if they do not have the necessary IT in place (Thakkar et al., 2008a).

Repeatedly it is reported that management refrains from IT implementation because of a high investment and reports about failure of IT implementation (Brau et al., 2007; Estrin et al., 2003; Koh and Simpson, 2005; Thakkar et al., 2008a). The lack of resource and expertise for IT in SMEs makes IT implementation appear to be an impossible endeavour (Estrin et al., 2003; Julien, 1995). A lack of knowledge or expertise can cause an attitude that IT is too challenging and therefore does not fit the company (Brau et al., 2007; Estrin et al., 2003). Moreover since management in SMEs is very close to the operational level of the business, they feel the pressure to be productive and do not look at IT implementation from a strategic perspective (Estrin et al., 2003).

The disadvantages of IT implementation for SMEs are understood; however, the advantages of IT implementation should not be overlooked. SMEs especially can benefit from IT implementation in the areas of operations, management and SCM. IT enhances operations' efficiency, effectiveness and profitability through information about their performance. In addition IT provides SMEs with accurate and timely data, which increases the confidence of the employees in internal operations (Adewole, 2005; Sharma and Bhagwat, 2006; Thakkar et al., 2008a). Moreover IT can help to reduce transactional costs, introduce more effective ways of designing processes and material handling, optimize stock management and reduce lead-times (Thakkar et al., 2008; Vaaland and Heide, 2007). IT also enables SMEs to exchange various kinds of information with suppliers and customers efficiently (Adewole, 2005). In addition IT increases SMEs' ability to have more responsive operations in place to fulfil demand quickly. This has a positive effect on competitiveness (Sharma and Bhagwat, 2006). In the area of management IT enables to gain information about their own operations, which enables IT supported planning and control and therefore enhances decision-making. Furthermore, IT provides a platform for internal information access and information sharing (Adewole, 2005; De Haan et al., 2007; Oakes and Lee, 1999; Vaaland and Heide, 2007). As discussed repeatedly in this thesis, IT has become a necessary prerequisite for SCM. IT supports efficient and effective information exchange in supply chains and enables management to organize logistics and supply

chain management (Adewole, 2005; De Haan et al., 2007). Overall it is argued that IT increases the survival rate of SMEs (Sharma and Bhagwat, 2006).

One particular kind of IT is ERP. The implications of implementation of ERP for SMEs will be discussed now. If a firm decides to implement ERP it needs to make sure, that the project is planned thoroughly and that enablers and inhibitors are taken into consideration (Bayraktar et al. 2009). The project plan should include the programme team structure, implementation strategy, selection of transition technique, database conversion strategy, risk management strategy and change management strategy (Malhotra and Temponi, 2010, p. 30). Malhotra and Temponi (2010) further point out that ERP implementation will affect the business as a whole and therefore the needs of the business should be evaluated with care before implementation. Throughout the implementation people represent the highest risk. Accordingly it is important to work with them very closely. This confirms the findings of Buonanno et al. (2005) that the reasons for non-adoption of ERP lie within the structure and organization of a SME and are not necessarily financially motivated. The benefits of ERP for SMEs are listed in Table 6.

- Ability to integrate business processes
- Improving customer satisfaction (speed of order processing, improving invoicing and reducing customer-service response times)
- Reducing inventory costs
- Improving efficiency and increasing profitability
- Reducing manufacturing lead times
- Reducing inventory and working capital
- Information about customer wants and needs
- Improving ability to change and responsiveness
- Ability to view and manage the extended enterprise of suppliers, alliances, and customers as an integrated whole

Table 6 Benefits of ERP for SMEs

(Muscatello et al., 2003; Koh and Simpson, 2005)

There are limitations related to the implementation of ERP for SMEs, which will briefly be discussed now. Firms implementing ERP must be aware of the “people factor”, as this appears to be one of the main reasons for failure (Muscatello et al., 2003). The training of staff is very important to ensure the success of ERP and to gain from ERP implementation quickly. Moreover, the implementation of a comprehensive system such as ERP for simple processes, does not necessarily mean, that the ERP is automatically used for more complicated processes, too. As a result the ERP might not be exploited to cover all processes in a company (Welker et al., 2008).

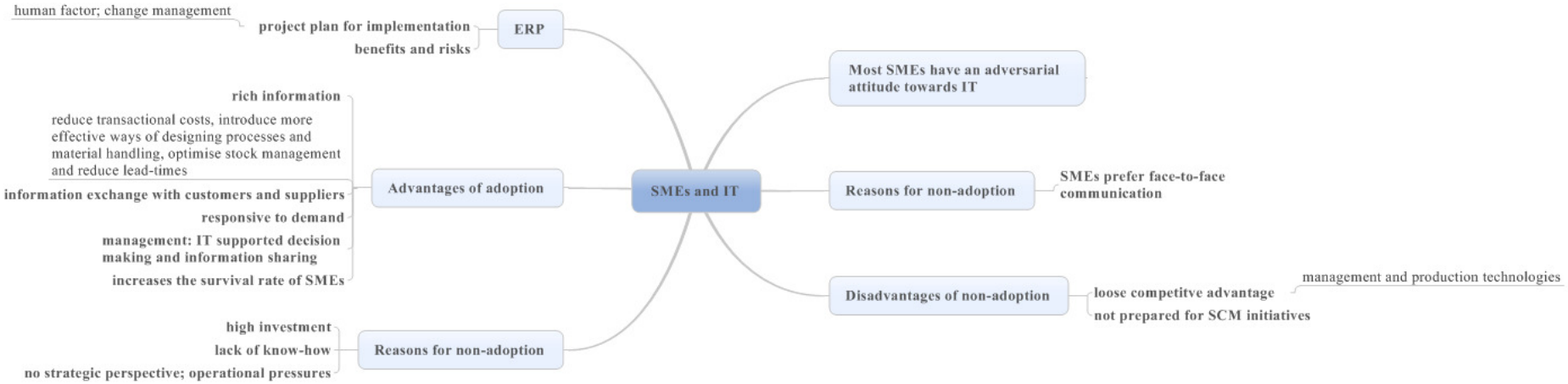

Figure 18 Summary SMEs and IT

2.3 Implementation of SCM in a SME

In particular Arend and Wiesner (2005) argue against the implementation of SCM in SMEs. Their main arguments are that SMEs do not pursue thorough project management for the implementation, which breeds poor results. Moreover they do not apply SCM in order to complement their strategy and SCM implementation, mostly, is imposed by other partners in the supply chain, which can result in benefits, but mainly results in financial burdens for SMEs.

Nevertheless numerous authors discuss the benefits of SCM implementation for SMEs. SCM positively influences a company's operational efficiency and effectiveness (Bagchi and Virum, 2000; Halley and Guilhon, 1997; Koh et al., 2007). It is repeatedly discussed, that SCM in SMEs catalyses financial performance (Brau et al., 2007; Kim et al., 2008) and competitive advantage (Halley and Guilhon, 1997; Kim et al., 2008). SCM enables a SME to focus on their core competencies through outsourcing or collaboration with other partners in the chain (Arend and Wiesner, 2005; Halley and Guilhon, 1997). Also logistics processes speed up (Bagchi and Virum, 2000) and the relationships with other partners in the supply chain, especially with customers and suppliers improve (Bordonaba-Juste and Cambra-Fierro, 2009).

The arguments of Arend and Wiesner (2005) appear to be valid and should not be neglected when implementing SCM in SMEs. Since the advantages of SCM implementation for SMEs outweigh the disadvantages, this section will evaluate aspects such as existing frameworks for SCM implementation in literature, company culture, change management and quality, knowledge and learning and existing case studies in order to lay the basis for the development of a framework for SCM implementation in the following section.

Due to scarcity of papers particularly in the area of change management, quality, knowledge and learning for SMEs, a small number of papers concerning LEs have been used. It is argued, that in those aspects the difference between SMEs and LEs should not be so crucial, as they are mainly concerned with human behaviour.

2.3.1 Frameworks in literature

Figure 19 summarizes and categorizes the aspects concerning SCM implementation in SMEs discussed in various frameworks in literature (Alba et al. 2005; Buananno et al., 2005; Brau et al., 2007; Fernandes et al., 2006; Gunasekaran and Ngai, 2003; Higginson

and Alam, 1997; Kim, 2008; Morrell and Ezingeard, 2002; Halley and Guilhon, 1997; Quayle, 2003; Singh, 2011, Thakkar et al. 2008b; Thakkar et al., 2009b; Towers and Burnes, 2008, p. 353) (see also Appendix 1-12). The basis for the categorization is the highlights taken from the definitions of SCM (see Figure 2 Attributes of SCM): strategic approach, management of the flow of information, material and capital, business management and goals and benefits of SCM. It appears to be logical to place relationship management and a holistic view on SCM under the heading of the management of the flow of information, material and capital; and to that enablers and risk elements are added.

The frameworks underline the importance of strategy for SCM, for this management needs to be integrated. Strategy development can be influenced by a company's perception of the environment and customers' dominance.

The management of the flow of information, material and capital is enabled through aspects such as the holistic view on the supply chain, relationship management, efficiency of manufacturing, demand management, capacity planning, warehouse and inventory management, transport management, lead-time management and performance measurement.

The management of a business, ideally, should comprise leadership, culture, organizational factors, inter-organizational coordination, technological enablers such as IT, which ultimately contributes to the production of high quality products and services.

Enablers of SCM in SMEs are, for example, top management commitment, commitment to SCM, capabilities in supply chain planning and execution and a customer perspective.

SCM in SMEs can be hindered by the reluctance to invest, fear to lose confidential information, an adversarial stance of LEs (e. g. takeovers) and LE dominance.

Nevertheless SMEs should work on SCM with the benefits they can gain from SCM in mind which are, for example, visibility in a global market, improved access to LEs, ease in order processing, reduction of paper work, improved order and demand visibility, efficiency, responsiveness and improvement of customers' value perception.

However, additional topics such as cultural issues and capabilities emerge in the context of the discussed frameworks for SCM in SMEs. Therefore, company culture, knowledge and learning will be discussed in the next sections. Furthermore, those issues will be embedded in change management and quality as enablers for a comprehensive implementation of SCM in SMEs.

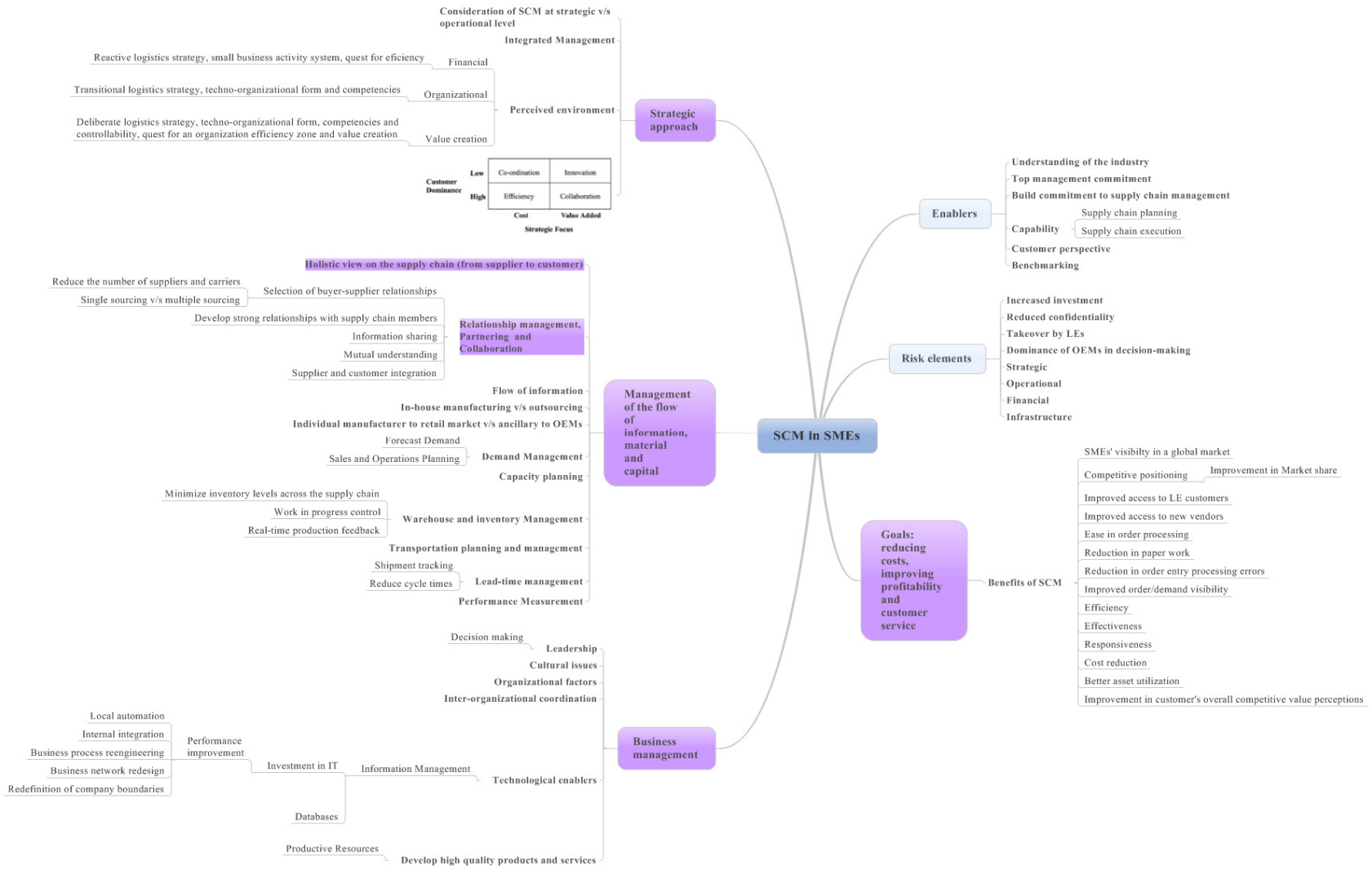

Figure 19 Summary of frameworks for SCM implementation in SMEs

2.3.2 Company culture

Company culture is defined as "a pattern of shared tacit assumptions that was learned by a group as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 2009, p. 27). " An organisation's culture comprises all of the values, beliefs, assumption, principles, myths, legends and norms that define how individuals and groups of people think, make decisions and perform" (Amnis, 2012, p. 3).

It is important to understand the culture of a firm as this defines how a company functions. Management needs to understand the forces behind culture, in order to align it with firms' objectives. Also sub-cultures, for example the culture of different departments, geographies and affiliate companies, need to be captured for the efficient management of a company (Schein, 2009).

2.3.3 Change management and quality

In a survey among 808 SMEs, 80% responded that they would not implement SCM initiatives and "overcoming traditional practices" was seen as a major problem (Quayle, 2003, p. 83). Gray (2002) points out that in general SMEs seem to be reluctant to introduce change initiatives, as they are more concerned to secure the survival of the business (Gray, 2002). In another survey only one quarter of the questioned SMEs introduce change on a regular basis, more than half of the participants seldom or never work on change initiatives (Table 7).

	Constantly introduce change	Occasionally introduce major changes	Occasionally introduce minor changes	Change only when necessary	Avoid change	Total (%)	SMEs (*n*)
Sole-trader	6	11	16	22	16	13	105
Microfirm (< 10)	51	52	55	47	66	54	436
10-24 employees	22	25	18	25	13	21	170
25-50 employees	14	10	9	6	3	10	81
50+ employees	6	2	2	–	2	3	24
Column totals (*n*)	219	155	302	64	68		808
Row % (*n* = 808)	27	19	37	8	8	100	

Notes: Chi^2 = 45.407; df = 16; $p < 0.0000$. All figures are percentages unless otherwise stated

Table 7 SMEs and change by workforce size

(Gray, 2002, p. 67)

Change is often imposed on companies by external circumstances. Loss of profit or market share makes change unavoidable, but introduces change in a reactive and abrupt manner (Beekmann and Robinson, 2004; Macri et al., 2002; Weick and Quinn, 1999). The major hurdles in implementing change seem to be the human, rather than the technical aspects (Fernandes et al., 2006). In order to be able to facilitate change in a structured and controlled manner, especially with regard to introducing SCM in a SME, this section will look at theories of change, the role of the change agent, resistance to change, how to manage change and success factors in change management.

Research concerning change often uses the Lewin-Schein theory of change as a basis. This theory assumes that people go through three stages in the change process: unfreezing, moving and refreezing. First, the current status of an organization (equilibrium) needs to be unfrozen, in order to make change possible. In the moving stage an organization or people move towards a desired state and adopt the behaviours, which are needed to make the desired state come true. Ultimately the organization needs to go back to freezing, in order to maintain the desired state (Hammond et al., 2011). During those three stages performance of staff drops initially but, ultimately, performance is higher than before the change initiative (Coget, 2010).

Van Hoek et al. (2010, p. 245) point out that change is a "messy, non-linear affair", which suggests that change theories may not be helpful for managing the change process itself. They, rather, help to understand or follow the change process. Therefore, the following paragraphs look at the different building blocks which need to be considered in the change management process.

The role of a change agent is described as a "(...) prime mover who creates change. Focuses on inertia and seeks points of central leverage. Changes meaning systems: speaks differently, communicates alternative schema, reinterprets revolutionary triggers, influences punctuation, builds coordination and commitment" (Weick and Quinn, 1999, p. 366). In order to be successful in a change project, the change agent needs to be aware, that the relationship with the employees involved can be crucial, especially in the early stages of the change process. Employees tend to be positive towards change if they have a good relationship with the change agent. Also the change agent is less likely to label problems in the change process as resistance if he or she feels to have a good relationship with employees (Ford et al., 2008; Oreg and Sverdlik, 2010). It is also important to choose opinion leaders, not necessarily managers, as change agents. Opinion leaders tend to be accepted and can act as like-minded people among

employees. Management, rather, should plan, coordinate and oversee the change process (Hammond et al., 2011).

Change is usually linked to uncertainty as at the beginning of a change project the outcome cannot usually be predicted precisely (TSO, 2009). As a result it is in human nature to resist change (Weiss, 2003).

Beekmann and Robinson (2004) differentiate between three different reactions to change in small firms. The first group of firms are those who do not change at all due to inertia and deadlock. Second, there are firms which may adapt and change quickly in times of rapid growth. Third, some companies change incrementally and execute change in an iterative way. It is stated that SMEs are more likely to resist change, as they do not have the time to assess their experience and learn from it. Therefore, they are reluctant to introduce change and, rather, stick to known routines (Gray, 2002).

Individuals can react to change in different ways. There are employees who actually accept change easily as they see it as the right way to go. However, there are also individuals, who resist change for various reasons. Resistance may be caused by factors such as uncertainty, ambiguity or lack of information resulting in denial of the need for change, missing goals, feeling of strain, or lack of confidence in the project manager (O'Connor, 1993; Self, 2007; Weiss, 2003). Also aspects such as the project scope, lack of training and collaboration between departments and funding can evoke resistance (Fernandes et al., 2006).

Also, intrinsic factors such as fear may play a role. Employees might be afraid of loss of power, redundancy, lack of competency to tackle the change, changes of company culture and changes in their familiar working environment (Schein, 2009). In SMEs there appears to be a relation between fear of job loss and the economic situation. "In the social setting under examination, organizational inertia is driven by a circular reinforcing process involving: the actors' search for irreplaceability based on technical skills, low propensity to delegate, low cooperation, high standardization of coordination, absence of shared learning, and fear of switching organization" (Macri et al., 2002, p. 306).

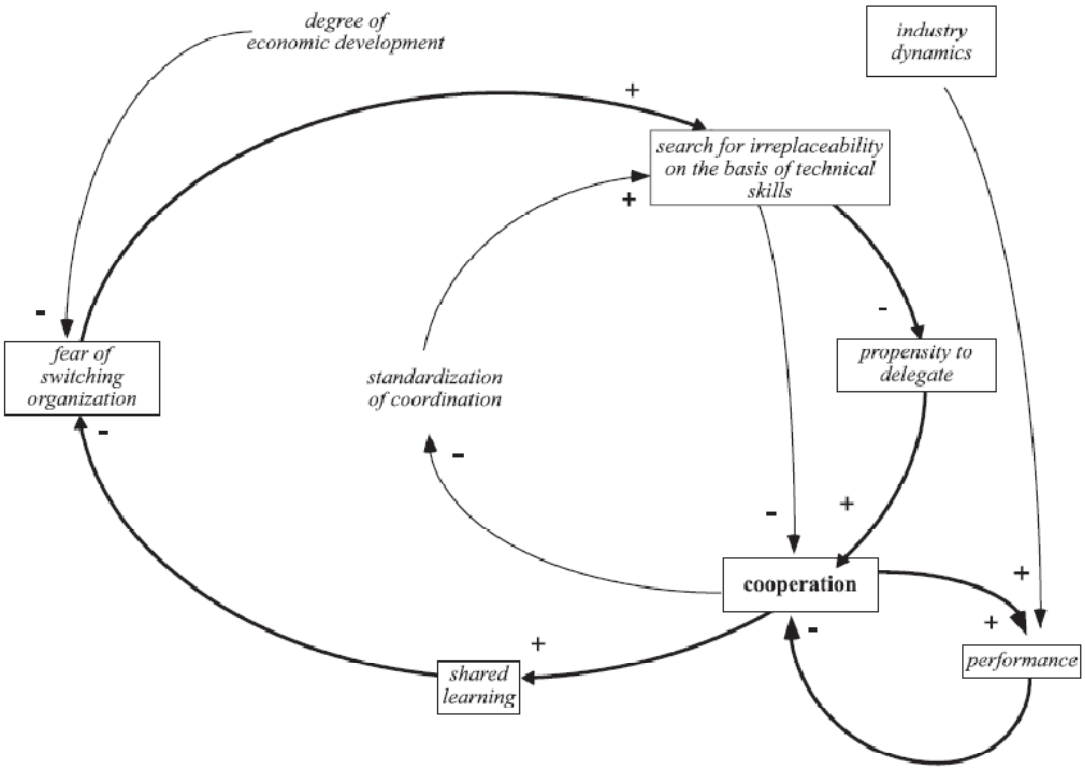

Figure 20 Grounded theory for change

(Macri et al., 2002, p. 303)

This shows that the fear of job loss induces further reactions, such as low willingness to collaborate on a technical basis and to support company learning, which impedes change additionally (Figure 20). Also past experiences, learnt beliefs and values play a role in how change initiatives are perceived (Thakkar et al., 2011).

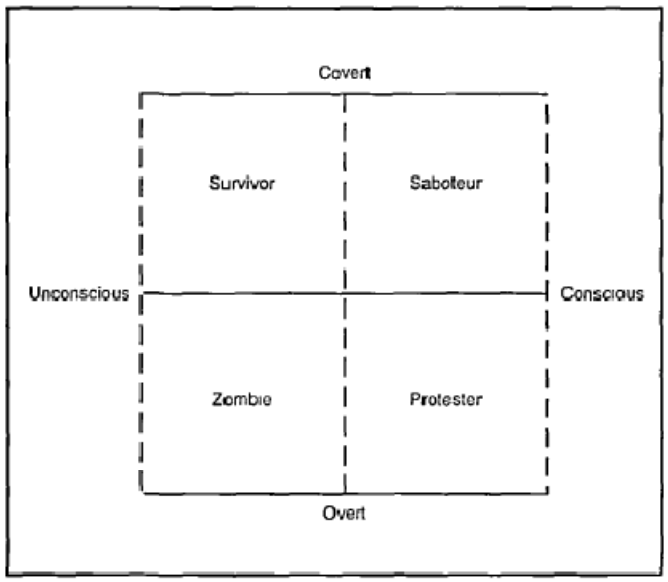

Figure 21 Resistance quadrants

(O'Connor, 1993, p. 33)

O'Connor (1993) distinguishes between conscious, unconscious, overt and covert reactions to change (Figure 21).If people react unconsciously (survivor and zombie) the

project manager should make people carefully aware of their reaction and make sure, that they understand the nature of change. People who act overt and conscious (protester) should be invited to contribute to the change process and give feedback and suggestions. “Saboteurs” should be questioned whether they support the goal of the change initiative.

Resistance seems to be less distinct in SMEs due to low hierarchies and a low degree of formalization (Ghobadian and Gallear, 1996). Nevertheless, the management of change needs consideration in order to overcome any kind of resistance and achieve the goals set.

First of all, the project manager needs to acknowledge resistance and needs to see it as a source for improvement suggestions. Employees may well be able to give suggestions where change might not be feasible or wrong. Managers should implement a feedback system as part of the change initiative because involvement and participation in the process is very important (Waddel and Sohal, 1998). This also contributes to trust and buy-in of employees into the change effort (Oreg and Sverdlik, 2010). “Agents can deliberately opt to make sense of recipient questions, complaints, and so forth by listening to it all as though it is a counteroffer that can update and refine the change to be more successful” (Ford et al., 2008, p. 373).

The change effort also needs to reflect the culture of an organization and the leadership style of the head of a SME, as it needs to suit the culture in order to maximize the benefits of the change project (Thakkar et al., 2009a). Change management can be hindered by a lack of strategy in SMEs (Weick and Quinn, 1999). Especially in the light of resistance it is recommended to have a long-term plan for change initiatives. If resistance should be overcome, then employees must be prepared to cope with change (Kumar and Kamalanabhan, 2005). A company, which communicates a vision as part of their strategy or business plan can use this to communicate the need for change, as a vision stands for a desired future state of an organization (Armenakis and Harris, 2002). A plan for change also has the advantage that performance can be measured and it can be clearly communicated what goals have already been achieved and what goals still need to be achieved (Lee et al., 2000).

In order to communicate change efficiently, five aspects need to be addressed in the change message: discrepancy, efficacy, appropriateness, principal support and personal valence (Armenakis and Harris, 2002; Self, 2007), which are described in Table 8.

Armenakis and Harris (2002) suggest a model to create readiness for change (Figure 22). The five change message components discussed are supported as well as driven by

active participation, persuasive communication and management of communication. Active participation can be achieved through, for example, enhancing skills and knowledge of employees through involvement and practice, observing and learning from others and involvement in decision making. Persuasive communication can take place through all forms of communication, such as speeches, presentations, emails, company magazines etc. Management of information should take place through internal and external sources to increase the level of information.

Discrepancy	A gap between the current state of an organization and a future desired state is addressed.
Efficacy	Employees must be confident that they can succeed in the change process and that they have the capabilities to do so.
Appropriateness	Employees must accept the change initiative. Agreement can be gained by mapping the development path of the change initiative.
Principal support	Top management commitment must be given, also in form of resources.
Personal valence	Employees must recognize what they can gain from the change initiative.

Table 8 The five change message domains

(Armenakis and Harris, 2002)

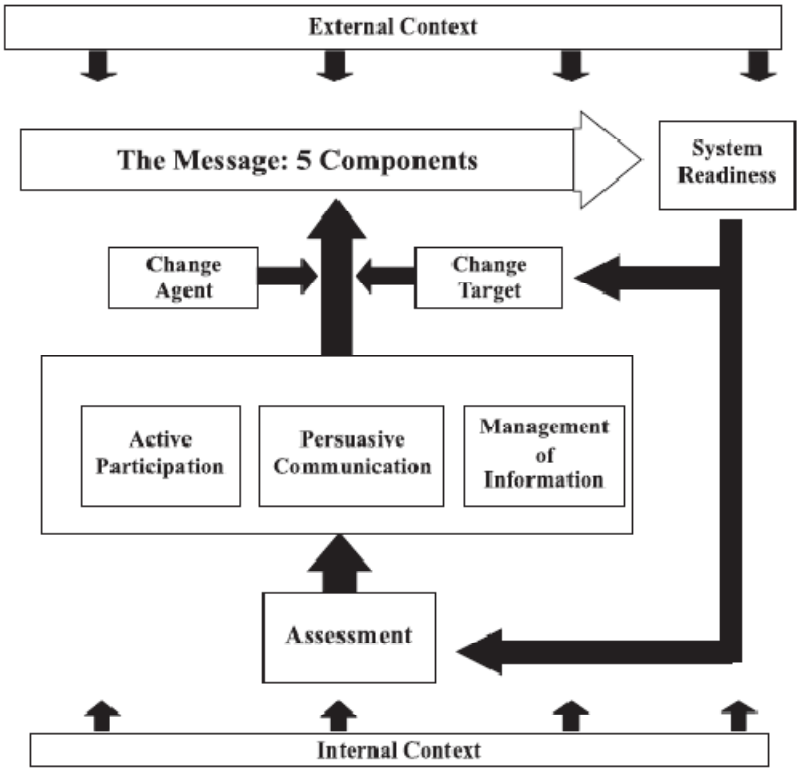

Figure 22 The change readiness model

(Armenakis and Harris, 2002, p. 171)

Small firms can support change management initiatives through a long-term perspective on recruitment and the appointment of employees, which possess self-efficacy, optimism and perceived control. Moreover, employees with higher education tend to cope better with change (Kumar and Kamalanabhan (2005). In addition change initiatives should be managed by cross-functional teams to ensure, that the efforts are congruent and supported by all departments. The teams should be empowered to do the task and they should have the right environment and resources for breeding change (Van Hoek et al., 2010; Waddel and Sohar, 1998).

The role of expertise and capabilities will be further discussed in section 2.3.4 Knowledge and learning, as it plays a crucial role in change management efforts. This has already been highlighted in the context of the change message (active participation and efficacy). Moreover, capability for change and a learning orientation needs to be established in the firm. Project managers also should take a learning approach and should adapt the project plan according to learning and findings throughout the implementation (Coget, 2010; Van Hoek et al., 2010).

In the context of a SCM change project, the access to top-level management is important, as it is likely, that they have the overview over the firm (van Hoek, 2010). It has also been found, that the control during the refreezing phase is very important in a SCM change project, in order to guarantee success of the project. In general SCM change projects seem to be less successful than change projects in other areas; therefore, they need special attention (Greer and Ford, 2009).

Project managers can use frameworks as an orientation for their change initiatives. For example, the wheel of change by Doppelt (2003) could be helpful. Doppelt suggests that all elements must be considered in the change process, but must not necessarily follow an order (Figure 23).

A framework which has been especially created for practitioners is presented by Erwin and Garman (2010), which is summarized in Figure 24. They advise paying special attention to resistance throughout the whole change process.

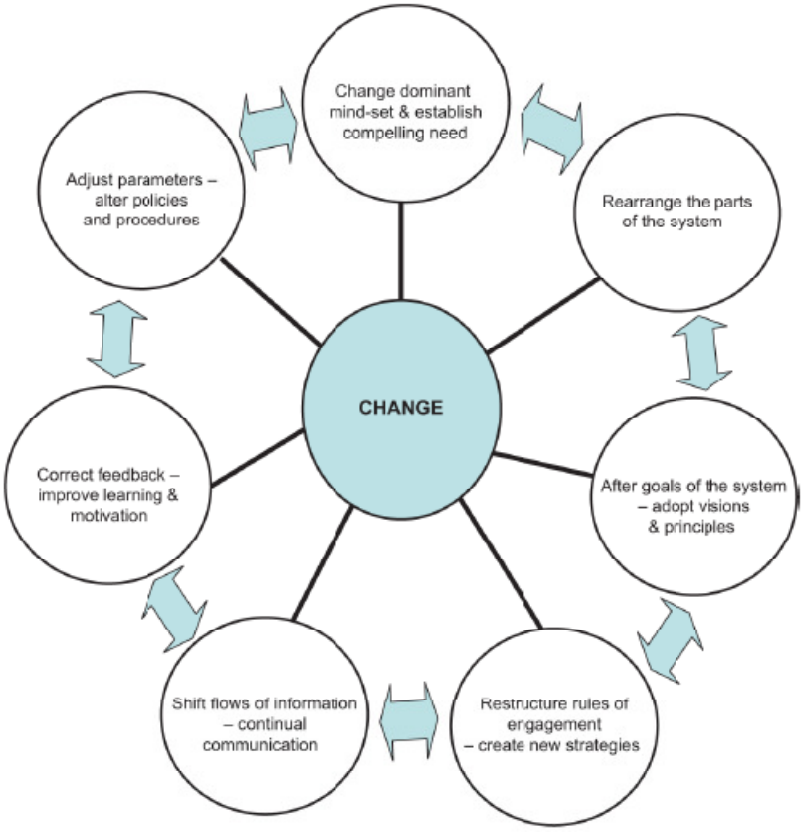

Figure 23 Doppler's wheel of change

(in Smith, 2011, p. 117)

What is resistance?	• Plan for resistance
How do personality differences influence resistance?	• Provide additional support
Openness to change	• Gain support and help
What are key concerns and response to change initiatives?	• Address individuals' concerns
Competence	• Provide support and training
What factors in the change process influence resistance?	• Communication
Understanding	• Ensure understanding of the change
Management consistency	• Examine policies and behaviors for consistency
Participation	• Encourage and allow opportunities for participation in the change process
How do management relationships and styles influence resistance?	• Develop confidence and trust
Management styles	• Emphasize more effective management styles
Employee relationships	• Develop quality manager-employee relationships

Figure 24 The change process in the light of resistance

(Erwin and Garman, 2010, p. 51)

Further success factors for change management are discussed in the literature, which will be presented now. Management should see their role more in the planning and direction of the project (Hammond et al., 2011). Moreover, time allowance for change initiatives should be very generous as change projects usually take longer than estimated (Van Hoek et al., 2010). Allcorn and Godkin (2011, p. 101) add the components of trust and respect to the definition of successful change management. 'Incorporating openness, transparency, inclusiveness, communication, reflectivity, and trust and respect into change dynamics seems to be essential. (...) A well designed approach to organizational inertia also contributes additional value added in two ways: the location of the need for change and the location and design of change will be enhanced. Change may well occur sooner and be better thought through. It is also the case that a non-defensive change process promotes the early identification of unintended consequences and problems, as well as the rapid location of solutions to them. If most employees feel included they will feel engaged and committed to making the work of creating change a success."

Smith (2011) sees an overlap between organizational change and quality. "Quality enhancement is concerned with achieving organisational fitness for purpose. A change from the status quo is assumed. Managing change is thus inherent in organisational quality enhancement – change and quality go hand-in-hand" (Smith, 2011, p. 127). Change and quality management go through similar steps, wherein they assess the gap between the current and the future desired state of an organization, prioritization of goals, agreement on solutions and learning from action. For this, tools such as benchmarking, informed decision making and process analysis can be helpful (Smith, 2011).

The following paragraphs will discuss total quality management (TQM), continuous improvement (CI), quick scan auditing methodology (QSAM) and business process reengineering (BPR) as vehicles for change. Then, two organizational process models which combine processes and quality are discussed as comprehensive frameworks to approach change in SMEs. Finally project management is introduced in order to manage change within a company in an orderly and controlled manner.

Total quality management (TQM) is a quality system, which takes a holistic approach and assumes the contribution of every function and process and ultimately every person within an organization to quality improvement (Lee and Oakes, 1996). As a result TQM should foster the coordination and management of information across all functions. Ultimately TQM aims at improving customer orientation and customers' experience

(Demirbag et al., 2006). It is proposed that TQM also heralds cultural change in a firm (Ghobadian and Gallear, 1996). SMEs benefit from TQM in the area of performance in general and efficiency, human resources and competitiveness in particular. However, the characteristics of SMEs, such as scarcity of time and knowledge can slow the introduction of TQM down (Demirbag et al., 2006; Ghobadian and Gallear, 1996).

Continuous improvement (CI) is very close to TQM and is considered an important part of TQM, as it also builds on costumer-focus, continuity, a long-term perspective, teamwork and a very close involvement of staff. It is defined as "an evolutionary incremental process which leads to a better way to compete and that adds value to existing processes and encompasses the entire workforce of the organization" (McAdam et al., 2000, p. 140). Continuous improvement in particular can benefit SMEs as it supports business innovation, since it allows employees to be creative and experiment with ideas. Ultimately companies, which introduce continuous improvement, are more agile and ready to react to change (McAdam et al., 2000).

The quick scan auditing methodology (QSAM) is a diagnostic tool to identify weaknesses in a supply chain which can be solved relatively quickly (Childerhouse and Towill, 2011). The disadvantages of QSAM are that involvement and feedback of staff are not materialized and specially trained consultants should be used to apply the method. It is proven, that medium-sized companies can improve the efficiency of their supply chain if they use QSAM combined with extensive communication to staff and feedback sessions. Therefore, QSAM can be used to motivate and expedite change (Atilgan and McCullen, 2011).

Business process re-engineering (BPR) is defined as "fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed" (Hammer and Champy, 2008, p. 35). BPR is seen as a more far-reaching, and as the definition says "radical", method than TQM and CI, as it seeks to question and re-organize established processes. The difference also becomes clear in the different steps used for BPR, which are development of a vision, review and document current processes, re-engineer the processes and implementation and measurement of the new processes. The focus is very much on processes without considering staff involvement or feedback. It is criticized for the top-down approach, but seems to be very established among IT consultants (Lee and Oakes, 1996).

The following paragraph will discuss two models for SMEs, which combine quality and processes in a quest for change.

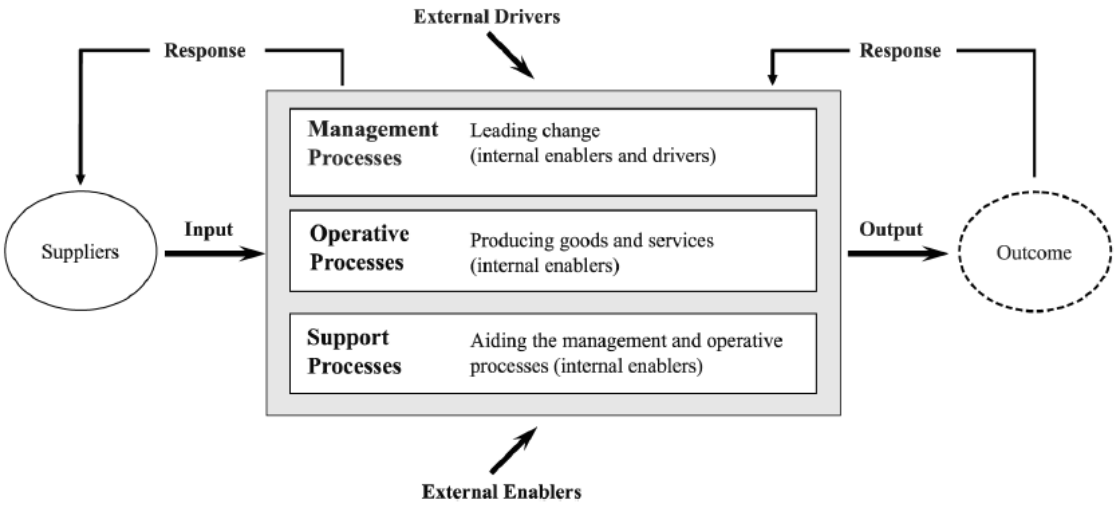

Figure 25 Organizational process model

(Isaksson and Garvare, 2003, p. 651)

The model in Figure 25 differentiates between input, drivers, enablers, output and response in a process. Input is considered to be the direct input of goods from suppliers, for example. An example for a driver is customer demand, management values or national legislation. Enablers can be the structure of an organization or its processes. The performance of the process should be measured through indicators. These enable the firm to detect changes and find the root-cause for performance deviations. It is advised that "the indicators should be relevant, understandable for the users, limited in number and adaptable to future developments. Necessary data should be readily available, of known quality, adequately documented and updated at regular intervals" (Isaksson and Garvare, 2003, p. 651). The model takes a customer perspective as suggested in TQM, as the performance of the process model should be regularly measured in the form of customers' response to the outcome.

In Figure 26 a model is presented, which embraces quality, processes, company resources, vision, culture and strategy embedded in a supply chain context with suppliers and customers. In SMEs total quality control, JIT, supplier development and relationship assessment tend to be introduced as a reaction to external changes. Lee and Oakes (1996) argue that change in SMEs is usually introduced on an operational basis, rather than from a strategic perspective. In addition, due to constraints of resources, employees and expertise, changes tend to be introduced in a step-by-step approach.

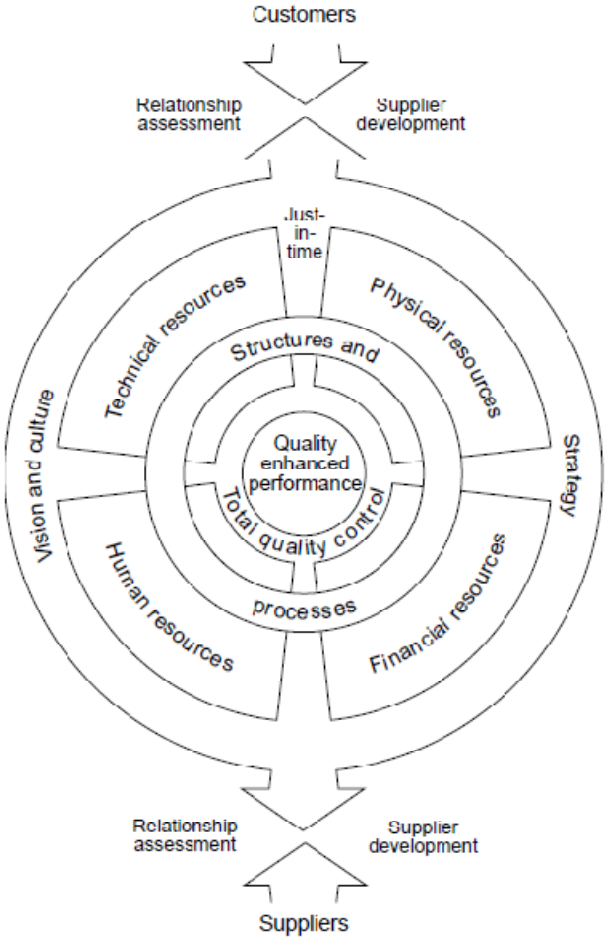

Figure 26 A model of operational changes for quality enhanced performance in smaller firms (Lee and Oakes, 1996, p. 207)

In order to gain full advantages of the introduction of change in a firm and to introduce the change as efficiently as possible, it is advised to embed the introduction in a project. Project management partly reflects requirements of quality management, as it helps to introduce change and manage uncertainty and should be done cross-functionally. Project management helps to control costs, time, quality, scope, risk and benefits of the change initiative. As a result change can be introduced as efficiently and cost-effectively as possible (TSO, 2009).

2.3.4 Knowledge and learning

In SMEs knowledge and learning seems to be either constrained or not appreciated / supported. It is reported, that small firms have problems obtaining skills (Gunasekaran and Ngai, 2003). On the one hand they do not have the time and resources to learn from experience, which fosters learning (Arend and Wiesner, 2005). Moreover, training does not appear to be valued in SMEs. Since survival of the business appears to be given highest priority in SMEs, expenses for training are given low priority, even though

performance could be improved through training (El-Namaki, 1990). Therefore, it does not surprise that knowledge and learning in the area of SCM is not advanced in SMEs at all (Thakkar et al., 2011). SMEs should even go one step further as, these days, it is increasingly important that companies add company learning to their agenda in addition to individual learning (Lee et al., 2000).

This section looks at the theory behind individual and organizational learning, how organizational learning can be facilitated and how the SCM learning need of an SME can be captured. Moreover, inter-organizational learning, especially in the light of SCM, will be discussed. Finally, this section will look at the role of external bodies in knowledge creation.

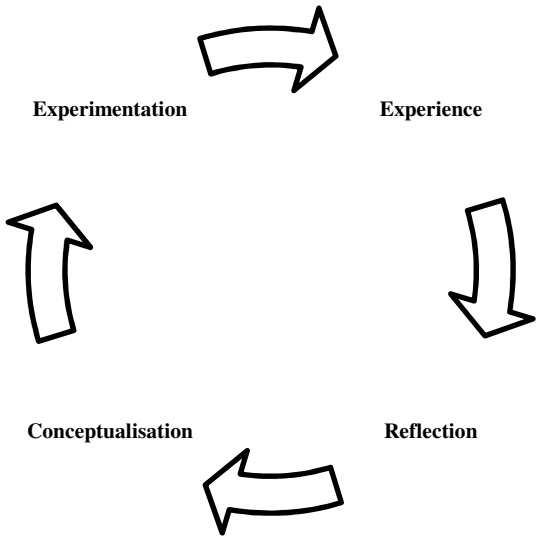

Figure 27 Kolb's learning cycle

(Kolb, 1984)

Individuals' learning process can be exemplified using Kolb's learning cycle (1984), which suggests, that people learn in several stages (Figure 27). Experience serves as a basis for observation and reflection, which are accepted and assimilated in abstract concepts which, again, serve for experimentation. The concept is iterative, which suggests that learning is an ongoing process.

Popper and Lipshitz (2000) argue that the model for individual learning can be applied to organizational learning. The difference is that reflection does take place at different systemic levels and different structures. In addition knowledge in organizations is usually made accessible for a wider audience through dissemination.

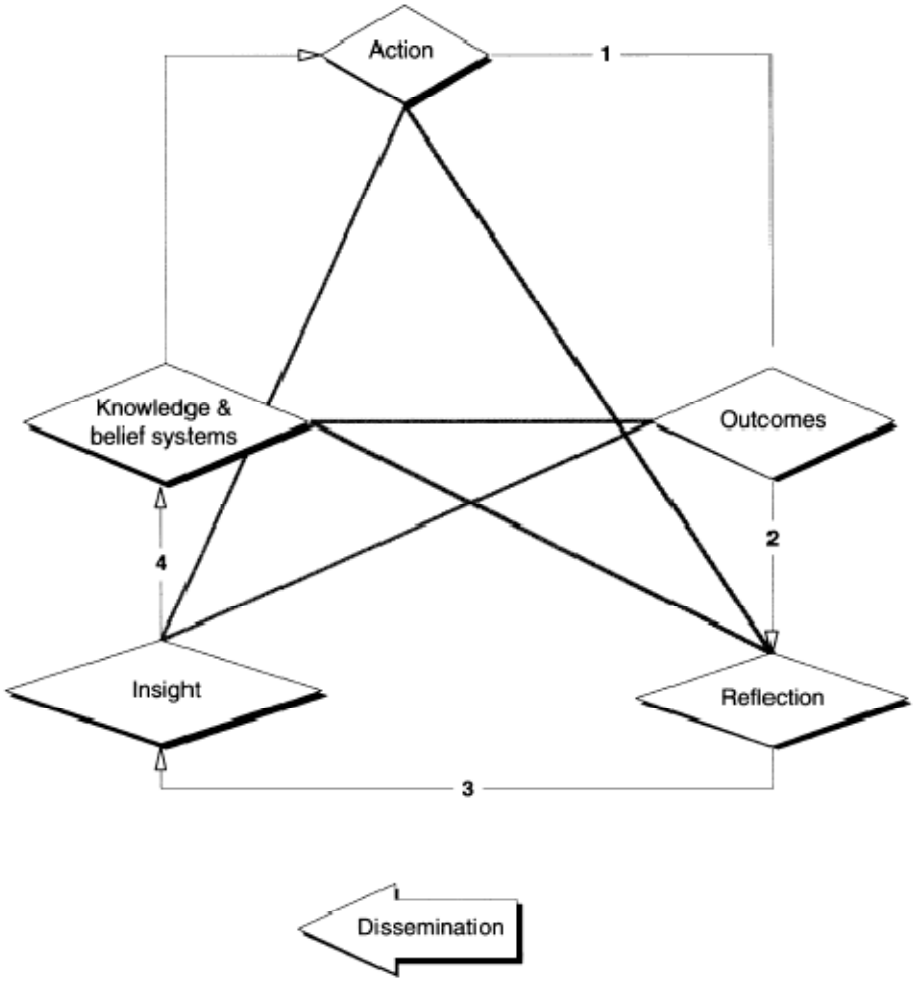

Figure 28 Organizational learning

(Popper and Lipshitz, 2000, p. 183)

The difference between organizational learning and the learning organization is seen as "the idea of a learning organisation as essentially a direction or goal, whereas organisational learning can explain and quantify the activities and events which are taking place within such organisations" (Lee et al., 2000, p. 551).

Burgoyne (1995) describes organizational learning from a different angle, taking vision, policy and operations in an organization into consideration. Here, individual action and collective action need to intertwine. At the same time collective action needs to leave room for individual learning, ideas and creativity. Policy and operations are a process of collective learning and are used to direct collective learning. Policy and ideas are areas where participation is taking place and ultimately common meanings are established.

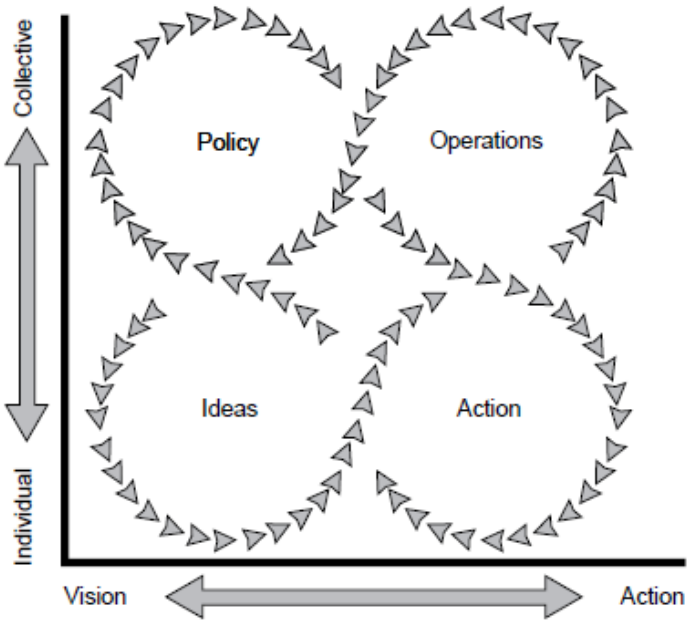

Figure 29 The learning company process

(Burgoyne, 1995, p. 68)

Organizational learning can also be facilitated through the recruitment of staff with new or different knowledge (Popper and Lipshitz, 2000). Moreover organizational learning can be differentiated between single loop and double loop learning. Single loop learning incorporates improving the current status, whereas double loop learning requires dissociation from the current status and redefinition of the problem (Bessant et al., 2003).

In general to facilitate organizational learning, in literature, two main aspects seem to be important for organizational learning: the role of leadership, also for the creation of a learning environment in an organization and the readiness to learn on a trial and error basis.

First of all, management needs to accept that adaptability to environmental uncertainty and dynamics is facilitated through learning. Learning is an important attribute to a company's survival and competitiveness. If a company becomes aware of the importance of learning and decides to pursue the creation of a learning organization, it is important, that management is committed and supportive (Popper and Lipshitz, 2000). "You can't say go do it without participating" (Popper and Lipshitz, 2000, p. 183). It is important, that managers adopt the role of facilitator and enabler within an organization in order to encourage learning (Lee et al., 2000). There are three distinctive roles management should take over, according to Lee et al. (2000). Those are designer, teacher and steward. The different roles are explained in Table 9. The steward should not only take care of the commitment to the mission, but also a shared vision for

learning should be created (Lee et al., 2000; Thakkar et al, 2011). For learning very much a democratic rather than an autocratic leadership style is important. Management should work on participative decision making through negotiation and collaboration. Problems should be solved cooperatively and employees should be allowed to challenge managements' opinions. (Thakkar et al., 2011).

Role	Role description
Designer	Creation of a purpose and core values.
Teacher	Facilitation of insight in the current status of the organization.
Steward	Monitoring of the impact of changes on the organization and creation of company-wide commitment to the learning mission.

Table 9 The role of designer, teacher and steward in a learning organization

(Lee et al., 2000, p. 553)

In addition it is the management's responsibility to create an environment which breeds learning. The basis for this is a sense of professionalism in a company. Professionalism ensures that learning in an organization is managed and continuously updated (Popper and Lipshitz, 2000). To create a learning culture in an organization, respect for others should be the norm. Also the importance of looking back at events in the organization's past and tacit knowledge should be emphasized. In terms of individuals' learning, people should be encouraged to seek originality, creativity, entrepreneurship. Employees should also be allowed to pursue their own ideas and interests with guidance from management. Organizational learning should be facilitated through the forming of groups which create organizational knowledge. This should enable employees to learn from each other. Not only should the importance of learning from others be engraved in a company's culture, but also the importance of learning from other organizations should be embedded (Lee et al., 2000; Thakkar et al, 2011).

Learning in an organization does not follow a model or pattern. Therefore, management needs to accept the trial and error nature of learning. This also implies that learning is not a guarantee for return on investment as it might not lead to meaningful results all the time. Nevertheless, error also stimulates risk seeking and an attitude towards analysis in an organization (Popper and Lipshitz, 2000). This kind of learning implies that there is a readiness to follow new paths of experimentation and innovation, which might also include unconventional ways of working (Lee et al., 2000; Thakkar et al, 2011). Especially in this context an organization needs to remember that it is important to revise experience and learn from it (Higgins, 2009).

Desouza and Awazu (2006) discovered four characteristics about SMEs in terms of learning, which can be classified into socialisation, common knowledge, knowledge

loss and exploitation of external sources. In SMEs knowledge tends not to be stored in systems or databases, but in managers' heads. Knowledge only becomes accessible, if it is passed on from management to staff and rarely is it disseminated the other way round, as staff is usually only concerned with operational issues and not with knowledge processing. It is attested, that common knowledge in SMEs is deep and broad, which helps to solve knowledge issues. Close social ties between employees in SMEs helps to avoid knowledge loss in SMEs. External knowledge is not well leveraged in SMEs from an organizational point of view. Individuals, however, use external knowledge, to expand their horizon.

It might be difficult to discover what an organization actually needs to learn. In the next paragraph two approaches are discussed, which can help to define for an organization, what knowledge needs to be obtained.

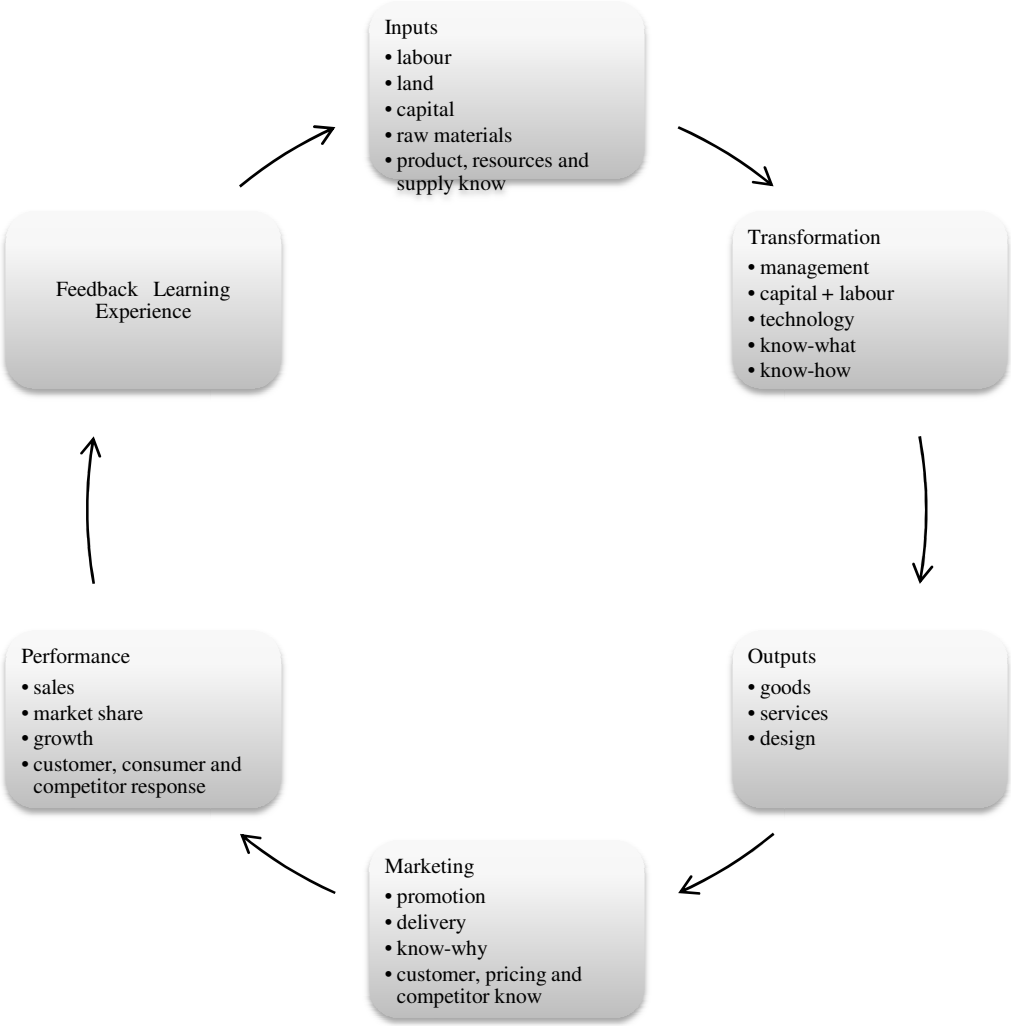

Figure 30 Value chain of knowledge needs in the small firm

(adapted from Gray, 2002, p. 63)

Gray (2002) depicts the different sorts of knowledge which SMEs typically need throughout the value chain (Figure 30). This can be knowledge about available products

or resources in order to foster inputs. In order to transform the business SMEs need to have the relevant know-how and in order to stimulate performance they need to know how to evaluate the response of competitors, consumers and customers.

Fletcher and Polychronakis (2007) offer a framework, which can help SMEs to define what kind of knowledge they need to obtain. The first step requires a review of the business in terms of strategy and vision from management, culture, operations (day-to-day business), resources, and management policies. In the second step the strategic knowledge gap is identified and how the gap can be closed should be defined. In the third step the existing knowledge in the organization is evaluated and documented, which enables management to judge which employee is suitable for which task. The procedure should be repeated regularly (Figure 31).

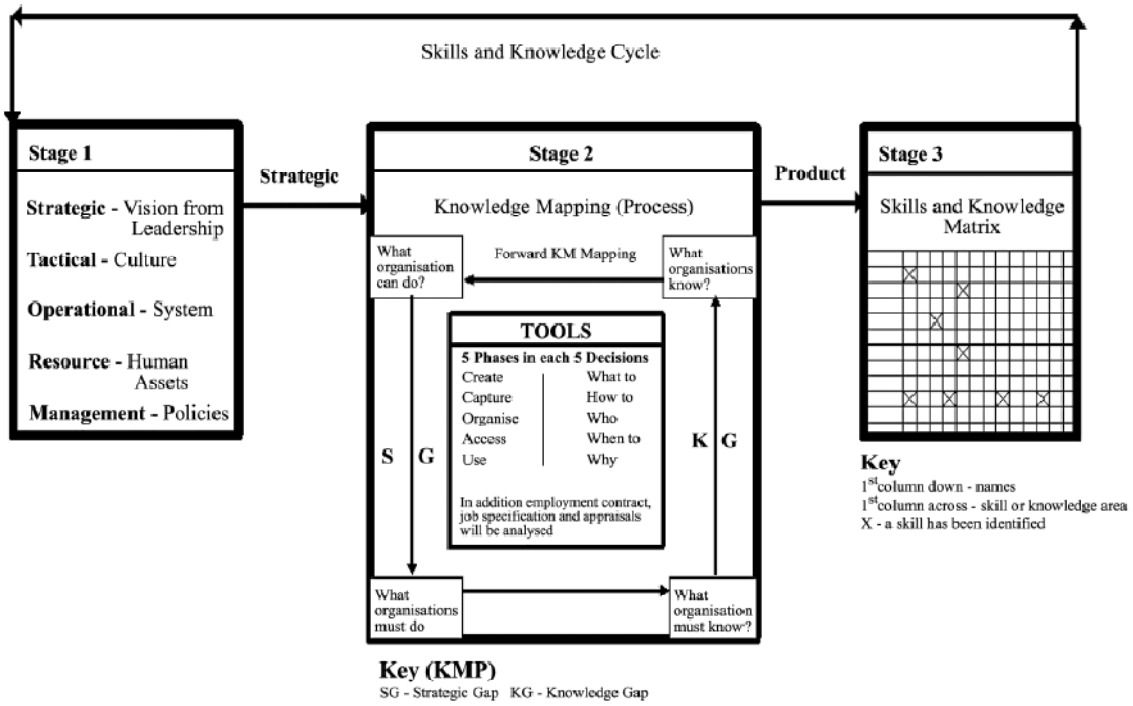

Figure 31 Skills and knowledge cycle

(Fletcher and Polychronakis, 2007, p. 197)

Another form of learning is inter-organizational learning. Repeatedly it is stated in literature that this serves the needs of SCM and integration particularly well (Higginson and Alam, 1997; Lee et al., 2000; Macpherson and Wilson, 2003; Spekman et al., 2002). It appears, that SMEs show an increased "external and supply chain orientation", which offers an alternative learning opportunity for SMEs (Macpherson and Wilson, 2003, p. 137). Moreover inter-organizational learning and learning from experience is a learning style, which is preferred by SMEs (Macpherson and Wilson, 2003). In order to persuade management of the benefits of SCM, a learning project with an external partner should be started off with education about the benefits, costs and techniques of

supply chain management. Trust and commitment are prerequisites for inter-organizational learning, so that the partners involved feel, that they can share confidential knowledge which, ultimately, will help to enhance the supply chain (Spekman et al., 2002). But it is also reported that inter-organizational learning can foster the trust required for integration in supply chains. Therefore, an iterative cycle reinforcing trust and commitment for integration projects is assumed here (Hult et al., 2003).

The advantage of inter-organizational learning for SMEs is that they can gain best practice knowledge, process and performance improvement, operational efficiency and cost reductions from it (Koh et al., 2007; Lee et al., 2000; Spekman et al., 2002). Furthermore it is essential to form, build and secure future competitiveness (Bessant et al., 2003; Hult et al., 2003).

When LEs engage with smaller firms, it is emphasized, that LEs need to take the characteristics of SMEs on board when designing a solution. Therefore, it is advised to design solutions according to the SME's characteristics, rather than imitate other existing solutions (Cagliano et al., 2001). Repeatedly it is stated that if a LE requires SCM from SMEs, the LE needs to take on a partnership approach and needs to support the SME in order to facilitate and support the project. LEs, especially, need to support SMEs in the area of learning and knowledge creation (Emiliani, 2000; Higginson and Alam, 1997; Macpherson and Wilson, 2003; Mudambi; 1996).

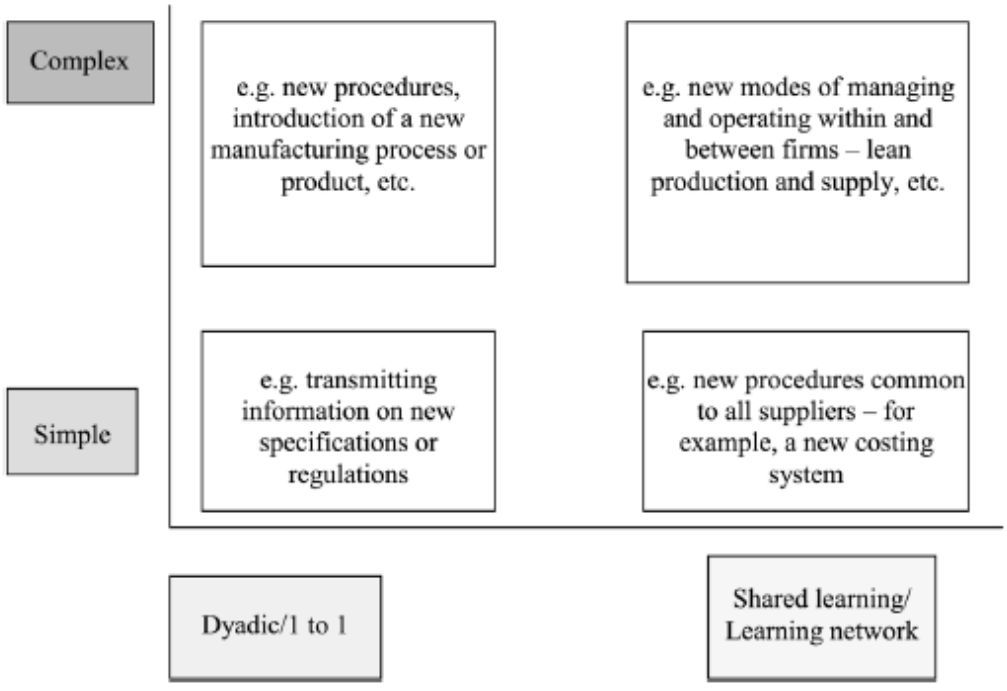

Figure 32 Different learning types and modes in supply chains

(Bessant et al., 2003, p. 171)

There are different forms of inter-organizational learning depending on whether the learning takes place in a simple or complex environment and whether only two partners or a network is involved. Depending on those prerequisites learning can vary from information sharing up to implementation of distinctive supply chain initiatives, such as lean production (Figure 32).

Action learning is named as a learning style which suits SMEs, because of its relational and conversational elements. Therefore, action learning can be a starting point for SMEs to become a learning organization. Once action learning has been embedded, this can lead to the trust, openness and flexibility which are needed for a learning environment. Ultimately, action learning also contributes to effectiveness and profitability of SMEs. (Choueke and Armstrong, 1998; Clarke et al., 2006; Powell and Houghton, 2008).

Bessant et al. (2003) give a comprehensive overview over the benefits, enablers and blocks in supply chain learning, which can help to justify and plan a supply chain learning project (Table 10).

Benefits	Enablers	Stumbling blocks
• Sales grown • On time delivery • Introduction of next day delivery • Implementation of Kanban • Stockturn increased • Scrap reduced • Set-up time reduced • Significant savings • Reduction of lead-time • Reduction of first tier suppliers • Increase of profit margins and revenue • Reduction of time-to-market • Access to better equipment and driver training • Increased productivity • Impovement of quality and delivery time • Reduction of inventory • Improved processes and reduced interface issues	• Visits to the shop floor of customers and suppliers • Joint teams of management and production staff • Extensive communication • Proximity of suppliers • Senior management commitment • External bodies, actively involved in the transmission of information • Disposition to learn • Avoiding an over-prescriptive approach • Willingness to learn from experiences • Focus on other aspects apart from price to assess suppliers and to ensure the sustainability of supply chains • Development of high quality procurement areas • Regular review of objectives and measurement systems • Practising an open-book type of relationship with the suppliers • High level of trust • Crystal clear objectives, methods of performance assessment and contracts	• Slow and inconsistent pace of change • Low levels of trust and the reluctance to become too dependent on suppliers/ customers • A lack of systematic overview to the problems of supply chain learning • Absence of a proactive culture both in relation to the broader problem of supply chain development and the more specific challenge which arise in promoting supply chain learning • Lack of right skills • Time constraint • Incompatibility between what the change agent wants to promote and the objectives of particular parts of the company • Some of the results of supply chain learning are not easy to identify and sometimes are attributed to other activities • Cultural differences between companies and within parts of the same company • Lack of processes to record the lessons obtained through SCL • Information disclosure

Table 10 Overview over benefits, enablers and stumbling blocks of supply chain learning (adapted from Bessant et al., 2003)

Repeatedly, the role of facilitating organizations such as knowledgeable third parties, knowledge partners or government bodies is discussed in knowledge creation. Independent bodies present knowledge in an unbiased manner, can provide an overview over what is feasible and can train SMEs in managerial knowledge. Such a solution can overcome the resource constraints, both in human and financial aspects and can provide awareness of the importance of training and the right skills and training for SMEs (Bayraktar, 2009; Cagliano et al., 2001; Emiliani, 2000). Networking also represents a form of learning and exchange for SMEs, which can be organized by independent bodies (Cagliano et al., 2001; Emiliani, 2000, Macpherson and Wilson, 2003).

2.3.5 Case studies

Case Study	Author(s)	Title	Initiatives and outcomes
1	Bordonaba-Juste and Canbra-Fiero, 2009, p. 393	Managing supply chain in the context of SMEs: a collaborative and customized partnership with the suppliers as the key for success	The purpose of this paper is to highlight the efforts of a Spanish SME, Bodega Pirineos, to combine technology and a customized strategy in communication management with its suppliers. The paper shows that technology is not always enough. Firms need to understand their partners and to communicate with them. Communication between a company and its suppliers is important for improving the efficiency of its supplying management. A proper management of business-to-business communication flow may guarantee the achievement of the necessary inputs and the meeting of the required standards for its products.
2	Fernandes et al., 2006, p. 623 and p. 632	Lessons from implementing the balanced scorecard in a small and medium size manufacturing organization	In this paper, a case study with a SME demonstrates how BSC (balanced scorecard) can be implemented successfully using a systematic and structured methodology. The successes described are: ability to respond rapidly, enhanced stability and operability of the company, low inventory level, lowered stock turnover, increase of speed of information flow.
3	Gunasekaran et al., 2000, p. 316	Improving operations performance in a small company: a case study	Considering the importance of SMEs, the experiences of a small company engaged in continuous improvement and a related conceptual model are discussed here to highlight how productivity can be improved with limited resources. The objective of the project was to improve productivity in two cells of the company, namely the Honda/Rover cell and the headlamp cleaning cell.
4	Muscatello et al., 2003, p. 850 and p. 868	Implementing enterprise resource planning (ERP) systems in small and midsize manufacturing firms	This research adopts a multiple case study approach to investigate the ERP implementation process in small and midsize manufacturing firms in the US. The research focuses on implementation activities that foster successful installations and are developed using information gleaned from our field studies of four projects. Success factors: effective executive management commitment, strong relationship between manufacturing strategy and successful ERP implementations, need for reengineering prior to selection of the ERP, needs assessment and project planning.
5	Riley and Brown, 2001, p. 17	Case study of the application of BPR in an SME contractor	The UK government strongly encouraged the construction industry to improve its efficiency during the 1990s. P Trant Limited, a medium-sized civil engineering contractor located in the south of England took on board this challenge and carried out a Business Process Reengineering programme. This paper describes the process modelling tools used, the reengineered processes and the efficiency gains produced. It is shown that mature medium-sized contracting companies can benefit from undertaking such a change programme and that the benefits are not restricted to large companies or groups.

6	Shokri et al., 2010, p. 639	Supplier development practice: Arising the problems of upstream delivery for a food distribution SME in the UK	The paper aims to emphasize on the impacts of the supplier development on reducing the defects in supplier quality for a food distribution small–medium sized enterprise (SME). An empirical study was conducted to measure the performance of the suppliers in three different key performance indicators of the outsourcing and supplier's performance to arise the existing problems via information exchange, data collection and data analysis. It was found that supplier development through data and information exchange and better communication by any food distribution SME raises the problems more promptly. This can dramatically change the supplier's behaviour to improve the quality of the supplier's service and products.
7	Tuusjärvi and Möller, 2009, p. 519	Multiplicity of norms in inter-company cooperation	This paper aims to examine the multiplicity of norms in inter-company cooperation in the context of an SME export group. It will show that the strategic interests of the parties call for more diversity in norms than that identified in existing studies on relational exchange. This study shows that both relational and discrete norms are necessary for cooperative groups. Furthermore, the paper argues that companies in cooperation have a shared need to retain a certain degree of independence and to develop normative expectations for autonomy while cooperating. Consequently, it suggests a new category of norms: "norms of moderated autonomy".
8	Wagner and Alderdice, 2006, p. 104	Managing the distribution channel: the case of Scot Trout and Salmon	This insight from industry aims to describe the case of Scot Trout and Salmon a company that acts as a distribution hub for a number of small and medium-sized enterprise (SME) specialist fish producers in the west of Scotland. A total of 90 per cent of Scottish companies are SMEs and with a fragile economy it is imperative that these SMEs can grow and flourish. The "load share distribution initiative" demonstrates one supply chain strategy by which this could be achieved.
9	Welker et al., 2008, p. 706	The influence of business conditions on supply chain information-sharing mechanisms: A study among supply chain links of SMEs	This paper investigates the influence of business conditions on internal and external information sharing and the role of ICT in order processing, using a multi-case study among SMEs. The study shows that simple business conditions are associated with limited information sharing and some use of standard ICT applications, in particular of ERP systems. Complex business conditions tend to be associated with greater sharing of external information while relying on traditional communication forms.
10	Williams, 2007, p. 93	A supplier development programme: the SME experience	The purpose of this paper is to identify and understand the learning opportunities that exist for smaller organisations within the context of a supplier development and business improvement environment. The research discusses the types of learning identified within two pilot activities and the benefits and issues for both the supplier and customer when undertaking development and improvement programmes. The results conclude that the collaborative nature of the supply chain environment is conducive to shared learning between the lead customer and the suppliers.

Table 11 Case studies of SCM implementation in SMEs

The ten case studies listed in Table 11 contribute to this literature research in several ways. First of all, they are a proof for SCM initiatives in SMEs. They clearly show that SCM is relevant for SMEs and that SCM is implemented in SMEs.

Second, the topics discussed in the papers do not differ from SCM topics discussed in the LE literature (section 2.1.6 Supply chain management practices and adaption in large enterprises). The list comprises topics such as logistics, supplier relationship management and supplier development, supply chain integration and information exchange and initiatives in order to improve information and material flow in the supply chain, such as balanced scorecard, operations management improvement, BPR and implementation of ERP.

Third, the cases described highlight the difference in depth of initiatives and research undertaken in small firms. The initiatives undertaken comprise very distinct projects, which focus on one particular topic in SCM. But the case studies also elaborate on less tangible and more philosophical subjects, such as incentives for information sharing and supply chain integration. The case studies show that SMEs appear to focus on one particular topic in SCM at a time, whether these are initiatives in a wider and more holistic supply chain approach cannot be judged from the evidence. It is assumed, that SCM in SMEs means the implementation of less extensive and but very distinct initiatives. This would be supported by the fact, that financial, human and knowledge resources are scarce in SMEs and cannot be stretched beyond their limits.

It appears that SCM implementation in SMEs is done in a piecemeal fashion. A strategic focus is ever more important in order to be able to see and develop coherence between the different SCM projects in SMEs and give priority to projects which will benefit the firm from a long-term perspective.

2.4 Framework for implementation and development of Supply Chain Management in SMEs

2.4.1 Supply chain management and small and medium-sized enterprises - is there a need for a new definition?

After reviewing the status of supply chain management in section 2.2 Supply chain management in small and medium-sized enterprises and comparing the case studies listed in section 2.3.5 Case studies, to section 2.1.6 Supply chain management practices and adaption in large enterprises, no major differences between SCM in SMEs and LEs can be detected. Therefore, it is claimed that the following definition of SCM is equally valid for SMEs: “All the activities involved in delivering a product from raw material through to the customer including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer and the information systems necessary to monitor all of these activities. Supply chain management coordinates and integrates all of these activities into a seamless process. It links all of the partners in the chain including departments within an organization and the external partners including suppliers, carriers, third-party companies and information systems providers” (Lummus and Vokurka, 1999, p. 17).

In recent years LEs have seen SCM as a source of competitive advantage. Some companies even see SCM as the most important source for competitive advantage. Since there are many competitors in most industries those companies succeed who can bring their products to the customers or consumers most quickly. Those who fail to orchestrate their supply chain in order to be efficient and responsive, lose sales and, consequently, revenue (Christopher, 2005). In recent years LEs have focused their organizations on SCM and implemented supply chain functions in their organization (Storey et al., 2007). Besides the traditional functions such as finance, sales and marketing, SCM emerged as a function in LEs. This development is also reflected in the fact that positions such as head of supply chain represented at board level become more and more eminent (Eyefortransport, 2011). It is understood that the financial situation of LEs allows them to implement SCM in a large-scale manner trying to achieve best practice in several areas. They can finance SCM implementation projects which last for several years. Moreover, they are less restricted when it comes to human and knowledge resources, since LEs usually attract a larger number of employees who are skilled and

benefited from higher education (Holden and Jameson, 2002). Finally, if LEs have restrictions on human or knowledge resources they can pay for workforce in the form of consultants, for example. From this perspective LEs do not face major barriers to build on SCM as a competitive advantage.

Even though the definition of SCM is equally applicable for LEs as well as SMEs, the way SMEs can gain competitive advantage from SCM differs from LEs. As stated in the previous section, implementation of SCM in SMEs needs to be far more focused and tailor-made than in LEs. Especially due to resource scarcity resulting in limited availability of human resource, knowledge, time and financial funds, SMEs need to be more selective in the SCM practices they choose to implement in order not to overstretch their resources (human and capital), but still achieve high impact. This aspect is especially important as the implementation of SCM in SMEs should be a source of competitive advantage for them. However, if the initiatives and the way of implementation are not carefully chosen and planned, SCM implementation could mean a game breaker rather than a game maker for SMEs. That means, for example, that they need to focus on one particular SCM best practice for an implementation project. As the case studies in 2.3.5 show, SMEs tend to focus on one particular initiative such as supplier collaboration, supplier development, continuous improvement, BPR, distribution or information sharing (Bordonaba-Juste and Canbra-Fiero, 2009; Gunasekaran et al., 2000; Riley and Brown, 2001; Shokri et al., 2010; Wagner and Alderdice, 2006; Welker et al., 2008; Williams, 2007). This way of SCM implementation might appear fragmental and done in a piecemeal fashion from a holistic SCM point of view. Nevertheless in the case studies the implementation of the initiatives proves to be successful and make a significant difference to the business of the SMEs. For example through data and information exchange the performance of a food distributor's supplier was improved and the failure rate was reduced significantly (Shokri et al., 2010). Also several small fish suppliers could increase their geographical reach through collaboration and as a result they improved their turnover significantly (Wagner and Alderdice, 2006). This shows that single initiatives can contribute to and sustain SMEs competitive advantage.

SMEs might not be able to implement the initiative on their own. It might be useful to bring in an external partner who could support them with the implementation (Cagliano et al., 2001, Emiliani, 2000). The external partner should be knowledgeable in the field of SCM and business management and bring in additional skills for project and change management.

Consequently there are various different aspects, which need to be considered for SCM implementation in SMEs. Those aspects probably have a different importance and significance than in LEs. The different aspects are discussed in more detail in the next section.

2.4.2 Framework

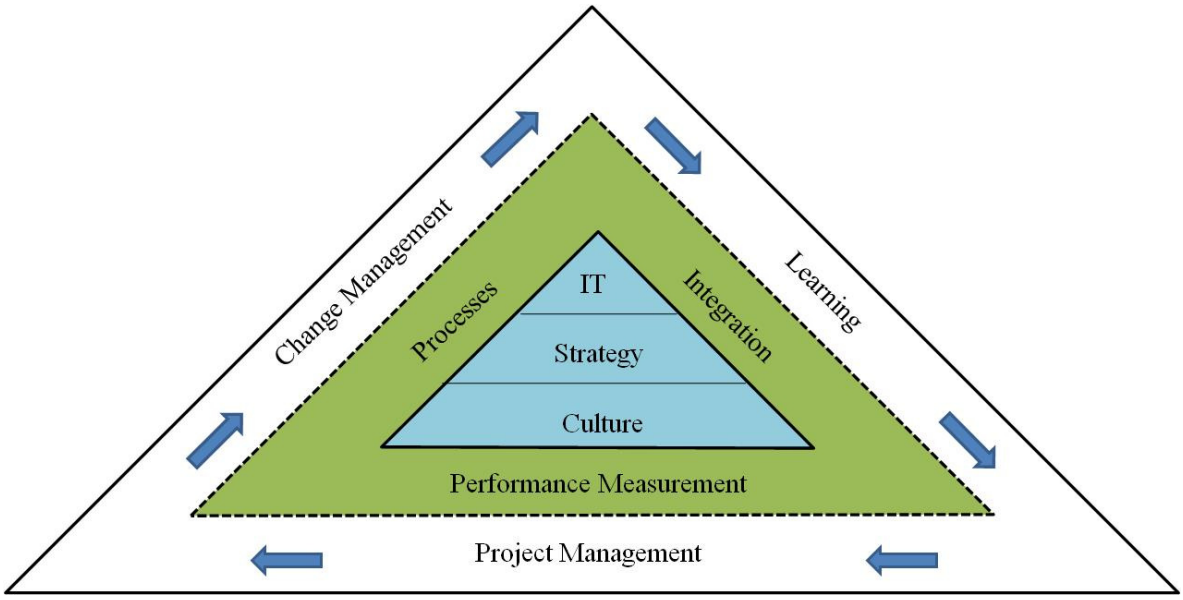

Figure 33 Framework for supply chain management implementation in SMEs

To start with and in order to develop a tailor-made solution for the needs of a SME, three aspects need to be elaborated, which are culture, strategy and IT. As discussed in section 2.2.1 General characteristics, management and operations, SMEs have attributes, such as constraint of resources, a strong and overarching position of the head and a limited availability of capabilities among managers, which results in a culture, which is most probably different to a culture in a LE. Strategy development is not distinct in SMEs and often not practiced due to lack of time or respective knowledge in strategy development. Moreover, the nature of SMEs is reactive rather than proactive, which contradicts strategic approaches. However, as fleshed out in section 2.1.4 Comparison of operations and supply chain management and the significance of supply chain strategy, strategy development is an important feature of SCM, as it guides the prioritization of initiatives for SCM. Finally, in order to be able to work on and develop SCM in a SME IT is an important factor. As discussed in section 2.2.5 Information technology, IT deployment is still in the early days in SMEs and processes are often still paper-based. Nevertheless the importance of IT for SCM must not be underestimated, as IT can provide important information about the performance of supply chains, in

particular about lead-times, stock levels and demand. Moreover, IT is important for the visibility of customers' orders as purchasing orders, which ultimately supports processes in a company. Putting IT, strategy and culture together, one also can speak of business management which, basically, is the heart of a company and supports the different functions in a firm, but also the firm as a whole.

Once those three aspects are in place a SME can start working on supply chain management. Two aspects of supply chain management have been chosen, which can impact the performance of a SME relatively easily: processes and integration. First, SCM can help to design internal and external processes more smoothly for an efficient flow of information, material and cash. Once processes are re-engineered, efficient and integrated, SMEs can also integrate with external partners in the supply chain. In order to see how well processes are working, performance management should be implemented to monitor the process performance. Also, distinct performance indicators should be chosen to see whether integration is effective and brings desirable benefits.

From the literature review it became obvious that integration for SMEs is overshadowed by an adversarial stance of LEs or a huge power imbalance between SMEs and LEs, which makes integration very difficult. It is understood, that this power imbalance is a thread to integration. However, LEs also could take a different stance, keeping for example game theory in mind, which says if both partners work together collaboratively they gain more than if they take an adversarial stance. If SMEs plan to work on and implement SCM it is advised to have a dedicated project manager, who overviews and directs the implementation in order to secure success. The time constraints existent in SMEs otherwise might cause such a project to taper off fairly soon, as nobody could take care of it. The project manager should be well aware of his or her role as a change agent, the reasons of resistance, how to overcome it and quality tools (for example TQM, CI or BPR) which can support change.

Through deployment of change management techniques such as long term planning, reflection of the company's culture in the change initiative, communication and use of cross-functional teams, the project manager can guide a major project such as SCM implementation through the phases of resistance. As discussed earlier, availability of knowledge in SMEs is an issue due to constraints of human resources. Therefore, ideally, the project manager should have SCM knowledge, which he or she can use for implementation, but also to train and teach management and staff in a SME. At the same time the project manager should also support organizational learning, so that a culture for learning is fostered and the SME as an organization learns about SCM

continuously. In addition, the project manager must be flexible enough to learn whilst implementing SCM in a company and feed the knowledge back into the project, so that the project can grow and improve on an iterative basis. Therefore, in the framework the line between the second and third layer is dotted, which should represent the permeability of knowledge and findings gained in the project management, change management and learning level to the layer of processes, integration and performance measurement. This can help to enhance and enrich the SCM initiatives on a continuous improvement basis. As mentioned earlier the SCM initiatives must be almost tailor-made for a SME as otherwise, due to time and resource constraints, there might not be a benefit for SMEs. The amount of initiatives available is enormous and the solution which suits the respective SME best should be chosen. The overview presented in Figure 19 Summary of frameworks for SCM implementation in SMEs, can be helpful and used as a guideline.

Finally, the project manager in charge should have the characteristics, which enable SCM in SMEs but also the risks associated with SMEs' characteristics for SCM, in mind, in order to reinforce the enablers for the project and try to eliminate the risks in order not to threaten the project (Table 12).

Enablers	Risks
• Regional, few suppliers and customers indicates a fairly simple supply chain • Strong in relationship building • Good communication • Room for supplier development	• Head of the SME plays a central role • Tend not to collaborate internally • Blurred departmental walls indicate a loose structure • Resource, time and finacial constraints • Limited knowledge • Powerful suppliers and customers

Table 12 Enablers and risks for SCM implementation in SMEs

(Arend and Wiesner, 2005; Brau et al., 2007; El-Namaki, 1990; Isaksson and Garvare, 2003; Malhotra and Temponi, 2010; Morrissey and Pittaway, 2004b)

The enablers and risks show two clear indications concerning SCM in SMEs. On the one hand SMEs' supply chains can be fairly simple and due to good relationship building skills and communication, integration with external partners should be fairly easy for SMEs. On the other hand flaws in structure, internal inertia and powerful customers and suppliers can endanger the endeavour to create efficient internal processes and integrate externally. This is aggravated by constraints in resource, time, finances and knowledge.

2.5 Summary

By tracing the development of SCM over the past 50 years it became obvious that SCM does not come naturally to companies, but the decision to implement SCM must be made deliberately. Companies must decide to integrate internal functions as well as external suppliers and customers in order to achieve a streamlined supply chain. Indeed, some papers claim that supply chain management is still in an infancy state in LEs. Therefore, it remains a question whether SMEs actually have a different starting position than LEs when it comes to the implementation of SCM?

SMEs have a different way of doing business than LEs and therefore foster a different culture. For example, SMEs operate regionally, produce a small number of products or services and face constraints of funds, employees and knowledge. A major difference is that the owner or managing director is the linchpin in a SME. Some of the characteristics can represent major obstacles for the implementation of SCM in a SME. Obstacles can be a lack of internal collaboration, blurred departmental walls and powerful suppliers and customers. SMEs also suffer from a constraint of resources (human and capital), which cause scarcity of time and knowledge. In the literature examples for SCM in SMEs can be found. SCM in SMEs does not appear to be very distinctive and rarely supported by strategy development and IT. In general, literature about SMEs is airy and in particular literature about implementation of SCM in SMEs is patchy and appears significantly influenced by literature about LEs. Rarely it is discussed how to facilitate the characteristics of SMEs for SCM implementation. In addition, no framework has been found which links the characteristics of SMEs with prerequisites for deploying SCM implementation as a project. As prerequisites for the implementation of SCM change and quality management and organizational knowledge creation and management have been identified.

As laid out in the aims and objectives of this thesis, a framework for the implementation of SCM in SMEs has been presented. The framework suggests that before implementing SCM in SMEs culture, strategy and IT have to be strengthened first. In terms of culture a firm must be able to understand their own culture and what constitutes it. Strategy and IT are seen as important prerequisites for SCM. Once those steps are taken, SCM can be implemented. Here, processes, integration and performance measurement are suggested as major tools. Those approaches have been suggested, as they appear to be achievable and beneficial for SMEs at the same time. Finally, it is suggested that SCM implementation should be structured through a project management approach and accompanied by change management and organizational learning. The knowledge

gained through organizational learning and change management should be fed back into the initiatives taken in processes, integration and performance management in order to be able to continuously improve them.

CHAPTER 3 METHODOLOGY

This thesis aims at achieving four objectives. The first objective aims at completing a literature review including the latest academic literature concerning SCM and the implementation of SCM in SMEs. The second objective is to develop a framework of critical aspects for implementation of supply chain management in SMEs for project managers and supply chain executives from the literature review. The third objective is to conduct a case study of a two year SCM KTP and, finally, to derive from the case study how supply chain management expertise can be developed and embedded in SMEs. This chapter will touch on the research philosophy and elaborate on the research approach which underpins this thesis. It will discuss how data has been collected and analysed in the research process. Furthermore, the development of the project will be explained briefly.

3.1 Research philosophy

The research philosophy or philosophical preference influences the researchers' perspective and the choice of research approach, design and methods as depicted in Figure 34.

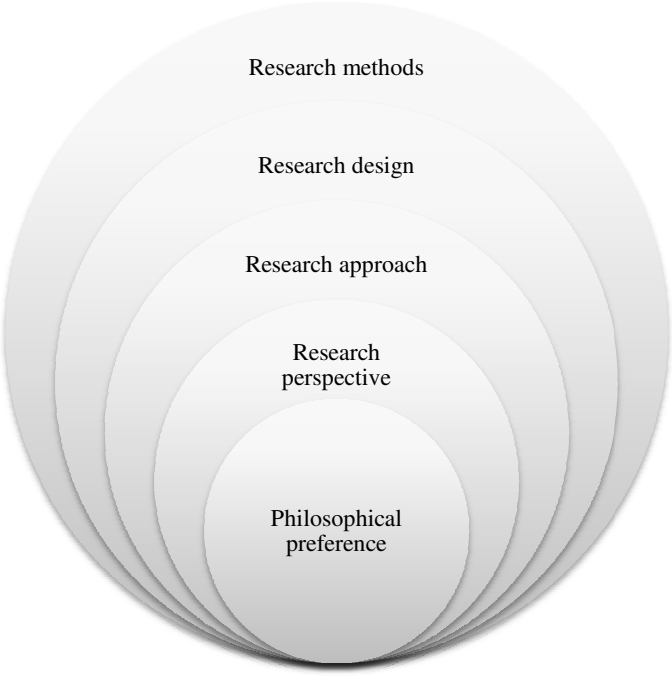

Figure 34 Research strata

(adapted from Cameron and Price, 2009, p. 58)

Philosophy debates ontology (the question of what exists) and epistemology (the question of what can be known and how it can be known). Academic research aims at adding to and developing knowledge and, therefore, the two questions above need to be

taken into consideration by the researcher. There are a number of schools of thought or research paradigms, for example positivism, idealism, interpretivism, constructionism, realism or pragmatism. They are briefly compared in Table 13.

School of thought	Description
Positivism	Testing of hypothesis developed from existing theory (deductive approach).
Idealism	The emphasis shifts from what is going on 'out there' to what is going on in the researcher's head.
Interpretivism	Looks for rules people use to make sense of social situations.
Constructionism	Interested in the way in which views of reality result from social interactions.
Realism	Takes aspects from positivist and interpretivist positions. Real structures exist independent of human consciousness, but knowledge is socially created.
Pragmatism	Emphasizes the socially constructed nature of sense and logic and the role of dialogue in reconciling different views.

Table 13 Schools of thought

(Cameron and Price, 2009, p. 56-57; Flowers, 2009, p. 3)

For this thesis a realist as well as a pragmatist position has been adopted.

Realism accepts that reality can exist without being observed scientifically and, therefore, realities can be valid without scientific proof. It agrees with positivism, that science must be based on empirical findings and must be rational and objective. However, measures are done subjectively and observations are explained through interpretation. "Knowledge is a social and historical product."(Cameron and Price, 2009, p. 57). An organizational researcher enquires "into the mechanisms and structures that underlie institutional forms and practices, how these emerge over time, how they might empower and constrain social actors, and how such forms may be critiqued and changed" (Flowers, 2009, p. 4). Pragmatism suggests that human logic depends on past actions and experiences derived from them. Consequently different participants in a research setting may have different logics and different explanations must be used to answer their questions. Here, knowledge and action are closely interlinked. For pragmatists "truth is what works: the meaning of an idea rests in its practical consequences. It is therefore, inevitably contextualised" (Cameron and Price, 2009, p. 58).

3.2 Research approach

In 1983 Daft already claimed that organizational research should be done by accepting trial and error in the research process as well as the literature review, explaining what the data means using a narrow sample but a deep approach for data analysis. Also common sense and in depth knowledge about the organization should be included.

Näslund (2002) suggests that in addition to case study research other forms of inquiry are necessary to develop logistics research further. “If we want to really develop the field then these traditional, almost positivist forms of case studies are not enough. (...) Logistics researchers have to gain extreme relevance by spending more time in organizations (...). This means that our research methods have to change as well and we have to use more ethnographic research and also perform action research.” (Näslund, 2002, p. 332).

This particular research lasted for two years and mainly took two research approaches into consideration: action (AR) and case study research.

There are several reasons why AR is suitable for the KTP project, which will be discussed in further depth in the following paragraphs.

AR appears to be especially suitable for organizational research (Näslund, 2002). It is defined as “an emergent inquiry process in which applied behavioural science knowledge is integrated with existing organizational knowledge and applied to solve real organizational problems. It is simultaneously concerned with bringing about change in organizations, in developing self-help competencies in organizational members and adding to scientific knowledge. Finally, it is an evolving process that is undertaken in a spirit of collaboration and co-inquiry” (Ahani and Pasmore, 1985, p. 439 in Coghland and Brannic, 2005, p. 3). The first part of the definition reflects the settings of the KTP. The definition also touches on one of the essential characteristic of AR, that “AR focuses on research in action, rather than research about action” (Coughlan and Coghlan, 2002, p.222). AR is about understanding action (Argyris, 1995). The research should be an interactive process between the researcher and the company. Moreover, the KTP project reflects further characteristics of AR. The KTP associate spends a considerable amount of time in the company (Näslund, 2002) as an “insider” (Cameron and Price, 2009, p. 316), as a participant rather than an observer (Riordan, 1995). The researcher is required to gain a thorough understanding of the organization (Coughlan and Coghlan, 2002) in order to solve existing organizational and managerial problems (Näslund et al., 2010). The outcome of action research should be a solution to a practical problem, which adds to scientific knowledge (Cameron and Price, 2009; Reason and Bradbury, 2011). Besides, the project should catalyse change in the organization (Näslund, 2002). A participatory setting is beneficial for change management (Waddel and Sohal, 1998). Therefore, the AR approach should benefit and foster the change process in Plastribution.

AR is an approach rather than a research strategy (Cameron and Price, 2009); therefore, different ways of data collection (qualitative and quantitative) can be used (Coughlan and Coghlan, 2002). Reason and Torbert (2001) introduce three stages depending on the depth of involvement of the researcher: first-person, second-person and third-person research. In first-person research the researcher treats the research problem as a "private" issue and does not include other people in the research. Second-person research involves at least one other person in the inquiry. Third-person research goes even further in including, for example, external stakeholders of the company in the research. Research might evolve from first-person to third-person over time. Moreover, it is important for the researcher to note that "(...) data generation comes through active involvement in the day-to-day organisational processes relating to the AR project. Not only are data generated through participation in and observation of team at work, problems being solved, decisions being made and so on, but also through the interventions which are made to advance the project. Some of these observations and interventions are made in formal settings - meetings and interviews; many are made in informal settings - over coffee, lunch and other recreational settings" (Coughlan and Coghlan, 2002, p. 231).

An important characteristic of AR is that data collection and analysis is embedded in an iterative cycle as depicted in Figure 35:

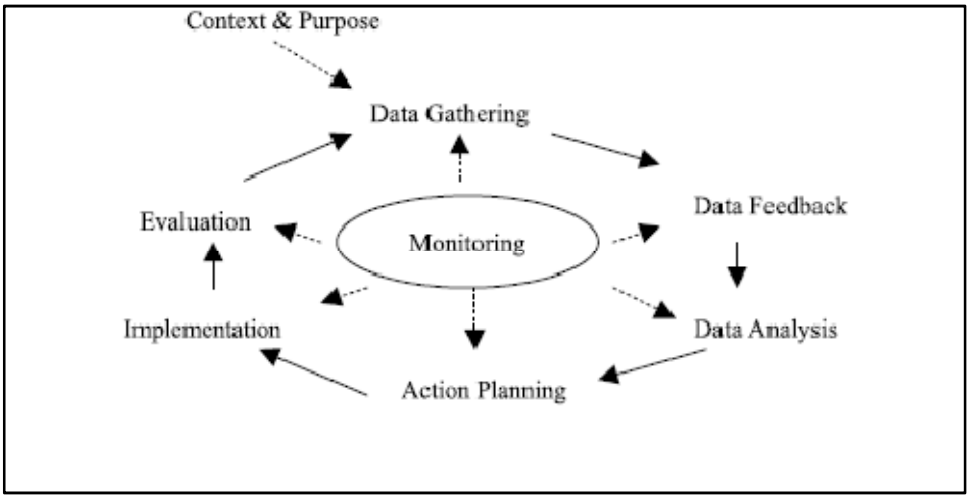

Figure 35 Action research cycle

Coughlan and Coghlan (2002, p. 230)

It is essential, that the researcher goes through the cycle several times otherwise it is not action research (Cameron and Price, 2009). The researcher is requested to collect data, obtain feedback from those involved in the research, analyse the data, plan for action, implement and evaluate the previous actions. The evaluation should lead to further data gathering and so on. By taking this approach knowledge evolves over time and

relationships with the people involved in the cycle improve. Reflection or monitoring as Coughlan and Coghlan (2002) depict it is very important throughout the whole process. “It is these different perspectives and the reflection upon them which create the conditions for increasing understanding. It is action that puts this understanding to the test. If an altered way of perceiving or thinking leads to improved action, learning has taken place which means that 'change' is likely to be sustained” (Cameron and Price, 2009, p. 322).

The researcher should not expect that every cycle evolves in the same way. One should be prepared, that processes can be uncontrollable and that the next step can only be planned when the previous step has been completed. This creates uncertainty, which the researcher must be willing to bear (Coughlan and Coghlan, 2002;Cameron and Price, 2009).

Through the AR cycle the researcher needs to build in reflexivity. “Reflexivity involves reflecting on the way in which research is carried out and understanding how the process of doing research shapes its outcomes.” (Holland 1999 in Hardy et al., 2001, p. 533). The benchmarking good practice in qualitative management research suggests three domains for reflexivity:

- Being reflexive about method
- Being reflexive about epistemology
- Being reflexive about discipline

Reflexivity about the research method involves thinking about how the research should be designed or conducted in order to obtain a convincing result. In this particular research AR has been involved, which is a reflexive approach in itself. Reflexivity about the epistemology has been discussed in Section 3.1 Research philosophy. Being reflexive about the discipline means to reflect on why this research object has been chosen. As explained earlier, the research is embedded in a KTP project with defined objectives and aims. Therefore, the research object was given.

AR has advantages and disadvantages, which will be discussed now.

The KTP should develop and embed supply chain management expertise that will both enhance the efficiency of the existing business and create an additional business opportunity. AR complements change management as it is a participative process. In change management literature it is emphasized that participation of the people involved in the change process is very important in order to gain ‘buy-in’ and reduce or eliminate resistance against change. Going through the AR research cycle and constantly monitoring and reflecting on the process with the people involved creates that

participative element in change management which can reduce resistance. As a result AR not only supports but also enhances the change management process by creating that participative element which is important to make change work. Furthermore, resistance can be used in order to reflect on the aims of change and it might be an indicator that change initiatives are not well enough thought through. (Waddel and Sohal, 1998). This is an indicator for AR, that another AR cycle is necessary.

AR research forces the researcher to reflect on the actions which have been suggested and implemented. As a result the researcher can discover what was well perceived and what could be improved. From tweaking the action either the current action or the next stage of this particular action or the project in general benefits. In the literature it is stated that continuous improvement is more beneficial for a company than one-off change. (Weick and Quinn, 1999). AR supports and enforces continuous improvement in an organization. Overall this approach also encourages the researcher to reflect, which facilitates learning and improving actions.

By continuously reflecting on the actions which have been taken and by obtaining feedback from the employees in the company, the researcher can gain further ideas and input. In traditional research exchange of ideas rarely takes place since the researcher applies theoretical and established knowledge in an organization. However, with AR the researcher is forced to communicate with the people in the company and to accept other employees' ideas. As a result the researcher is more involved in the organization and also obtains more input and ideas. In this particular case the research can be very effective as the culture in the focal company is rooted in communication and exchange of ideas.

Throughout the research weaknesses and difficulties of AR for this particular case became obvious. The associate is not an experienced researcher, especially not in organizational research. As the KTP project also demands managerial abilities the researcher is sometimes overwhelmed with new experiences, the necessity to manage the KTP project and doing AR at the same time. On the one hand AR supports learning as discussed above. On the other hand the associate feels that AR is more effective and probably also easier to conduct by experienced researchers and managers, since they can process information more easily, as they already have experience.

As discussed above the researcher is new to AR and has not worked in a management environment before. Consequently, reflection and feedback is very important to the researcher, in order to make sure not to misinterpret observations. Generally she felt that it was difficult to find a partner for reflection in the organization, as people were not

used to critical thinking. This might be because staff might fear disadvantages if they criticize processes or actions in the organization. Another reason for reluctance might be that some people do not trust the researcher and generally are not interested in the outcome of academic research.

Resistance to change and particularly resistance concerning the KTP project could paralyze it. If the researcher has no partner for reflection in the organization and if the project is blocked in the organization, the researcher cannot go through the cycles which are paramount for AR. Nevertheless, the researcher could reflect on the processes with the academic supervisor and at a later stage with the company supervisor, too.

Supply chain management is an overarching concept and, therefore, a lot of information and data in the organization can be relevant for the research. The challenge for the researcher is to filter the most relevant information for the research and pursue those ideas. From the nature of AR the researcher has to be prepared that AR is messy. That means that the development of the research cannot always be planned and influenced. This puts the researcher in an insecure situation, which has to be handled, too. (Näslund et al., 2010).

The general strengths and weaknesses of AR are summarized below.

Strengths	Weaknesses
- Research approach for tackling real-world, managerial and organizational problems - Facilitates organizational improvement programs - Research serves to connect strategy and operations - Provides different perspectives on processes - The researcher as a participant rather than an observer	- Messy and unstructured approach - Absence of a firm definition of the problem - Interaction between policy makers and scientific advisers is complex - Involvement of the researcher makes it difficult to evaluate the organization setting with a critical distance - Time-consuming - Results cannot be generalized

Table 14 Strengths and weaknesses of action research

(Coughlan and Coghlan, 2002; Näslund, 2002; Prybutok and Ramasesh, 2005: Riordan, 1995)

Another research approach used for this thesis is the case study.“A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 1998 p. 18). The case study approach has been recommended for new topic areas (Eisenhardt, 1998). For this thesis it has been decided to conduct a single case study mainly due to the set framework of the KTP. The aim of the case study was to learn about the supply chain management KTP in order to be able to derive from the case study how SCM expertise can be developed and embedded in SMEs. It was important for the researcher to gain as much insight into the company’s supply chain processes and practices as possible to be able to evaluate the situation. Therefore, a

broad research approach was appropriate. The case study approach enabled the researcher to gain a "rich understanding of the context of the research and the processes being enacted" (Saunders et al., 2009, p. 146). The case study approach especially answers 'how' and 'why' questions. It also supports the exploratory nature of this research and enables different data collection methods (triangulation) to be combined. (Saunders et al., 2009).

The findings of the case study will be written as a narrative. (Fisher, 2010). In order to structure the findings of the case study, the case analysis framework by Taylor (1997) has been used so that it can be easily followed and understood by the reader (Yin, 1981, p. 64) (Appendix 13). The researcher decided to use this particular framework as it enables the researcher to depict a thought through overview over the current status of the supply chain of a company. Other frameworks for research about supply chain management appear to be focused on SCM in LEs (for example Chen and Paulraj, 2004), which does not complement the aim of this thesis. This particular case study serves as a basis for theory generation as well as theory testing (Näslund, 2002).

There are several limitations of the case study approach. One limitation of the case study is representativeness. The findings of this case study might possibly not be true for other companies (Fisher, 2010). Furthermore, as the case study is created using contextual information the researcher might struggle to judge what information is relevant for the aspect studied. Also, the volume of information might cause confusion of what data to use for the case study. This can lead to a vast amount of information but can inflict focus. Research also can drift and result in narrow-minded theory representing only the researcher's view. Therefore, the researcher has to ensure that the findings result in sound conclusions (Cameron and Price, 2009; Eisenhardt, 1998).

Advantages of the case study approach are the likelihood of generating novel theory, testing of theory with readily measurable constructs and the development of theory which is likely to be empirically valid (Eisenhardt, 1998). Furthermore, the research interest is explored in a natural setting, several entities in an organization are explored and the focus is on present occurrences (Näslund, 2002).

In a longitudinal case study the researcher must be aware of further aspects. The researcher must be prepared that initial findings might be overwritten by later findings and endurance is needed to do longitudinal fieldwork. "Moreover, this methodology can require that the researcher spends almost as much time and effort on setting organizational expectations and on fostering and maintaining his/her relationship with the organization as on the actual data-gathering" (Leonard-Barton, 1990, p. 263).

It has been ensured that external validity, reliability and construct validity is given throughout the case study. “External validity reflects how accurately the results represent the phenomenon studied, establishing generalizability of results. (…) Reliability – addresses the repeatability of the experiment, and whether replication is possible and will achieve the same results.” (Ellram, 1996, p. 104). Construct validity is established by using several sources of evidence, describing a chain of events and asking key people involved in the case study to review it (Ellram, 1996).

The researcher built in external validity through an unbiased, thorough and objective documentation and evaluation of the information and data collected throughout the KTP.

Construct validity in this research is secured through triangulation. Triangulation is achieved through the usage of several sources of data, primary and secondary, such as papers, industry reports, technical training documents, internet information, observations, company publications, questioning and interviews. Triangulation helps to ground the theory, gives a synergistic view of evidence and fosters diverse perspectives (Eisenhardt, 1998; Näslund et al., 2010). Construct validity is also achieved through developing a clear narrative (Ellram, 1996). The case analysis framework in Appendix 13 helps to structure the case study and to include all important aspects of a supply chain case study.

Halldorsson and Aastrup (2003) suggest further quality criteria for qualitative research. They advise to consider truth-value, transferability, contextualism, trackability and explicity. Truth-value is a “matter of being aware of the nature of the phenomena in question, and then to choose the relevant criteria that fulfil the idea of a coherent research methodology” (Halldorsson and Aastrup, 2003, p. 330). Transferability and contextualism is achieved through thorough descriptions of best practices and detailed descriptions of the context, so that the reader can see the differences between the two. Trackability and explicity is achieved through documentation of processes, decisions, data sources, questions and theories from which conclusions are drawn.

Truth-value in this particular research is achieved through choosing action research, which suits SMEs particularly well (Clarke et al., 2006). Also the case study approach ensures that rich data about the research is provided.

Transferability and contextualism in this research is ensured through the thorough description of a general process model and how it has been adapted for the need of the focal company. Also best practices for SCM implementation in SMEs have been discussed in the literature review and summarized (Figure 19 Summary of frameworks

for SCM implementation in SMEs). Trackability and explicity is secured through the documentation of research results in a research diary, documentation of decisions, regular reviews of the project, thorough filing of data resources and analysis and reporting of results.

3.3 Research process

The research process comprises data collection, analysis and the time horizon and milestones of the research.

3.3.1 Data collection

Throughout the research it was ensured that the research fulfilled ethical requirements. Interviewees were not harmed and their privacy was respected. They were also informed about the nature and objectives of the research (Bryman and Bell, 2007). Since people in the company might not be familiar with academic research it is necessary to give them information about the research in order to prevent anxiety or other negative reactions to the planned inquiries (Coughlan and Coghlan, 2002).

The data collection and data analysis throughout the KTP project followed the action research cycle (Coughlan and Coghlan, 2002). The researcher started with data gathering, for example, through data analysis or through workshops. If she was not sure about certain aspects or needed further clarifications she asked for feedback. Also after workshops or training for the focal company she asked the participants to give feedback. Then she started with analysis and planning of further steps, which were usually followed by an implementation phase. The implementation for example comprised continuous improvement as the result of a capabilities workshop or process improvement efficiency (PIE) according to discussions with two departments about process efficiency. The implemented solutions were evaluated after some time and modified if necessary. The completion of one action usually led to new data gathering. The whole process was monitored by the researcher through documentation of the discussions and outcomes and regular reviews with the company and university supervisor.

It has been made sure that the criteria for theory building have been followed, which are conceptual definitions, domain limitations, relationship-building and predictions. Theory building is important because it forms a base for analysis. “In short, any definition of theory should answer common questions that researchers face. First theory

defines all variables by answering the common questions of who and what. The domain specifies the condition where the theory is expected to hold by using the common questions of when and where. The relationship-building stage specifies the reasoning by explaining how and why variables are related. And last, the predictive claims specify "Could a specific event occur?", "Should a specific event occur?", and "Would a specific event occur?" (Wacker, 1998, p. 364).

Primary Data

Primary data was collected throughout the two years of the KTP project on various occasions.

- The researcher met her company supervisor on a weekly basis. In the meetings the progress of the project, next steps, any difficulties, but also achievements were discussed.
- The researcher also reported to the managing director in monthly review meetings. In the meetings past achievements were presented and agreements for next steps were sought, where necessary.
- The progress of the project and any academic or project management related issues were discussed in internet video conferences with the academic responsible for the project at Hull University.

The information received from the meetings, as described above, mainly consisted of feedback, agreement or disagreement to suggestions and suggestions from the meeting participants. This helped the researcher to develop the project further, built management's, staff's and supervisors' ideas in and adapted the project to it.

The researcher also conducted three workshops (capabilities, benchmarking and risk) which served as a rich source of information concerning the performance and supply chain risk of the company. The workshops are described in more detail in section 4.2.2 Performance benchmark. The researcher also delivered training (project management, managing meetings and time management) which are described in section 5.2 Recommended solution and justification.

Primary data was obtained from a supplier and customer analysis, using existent data in the company. Concerning suppliers aspects such as supplier location, quantities sold, profitability of material, SRM and efficiency were analysed. Concerning customers customer location, sales areas, quantities sold, material varieties bought, profitability and customer expectations were analysed. The data was mainly retrieved from the BI tool but, partly also, from the ERP system. She also received primary data concerning

customers from customer visits and from a customer survey conducted during the KTP project. Also, information from suppliers during supplier visits was received.

Throughout the implementation phase of the initiatives as part of the KTP project she continuously sought for feedback and suggestions for improvement of the initiatives and the way of implementation.

Overall the main source of data for this research was face-to-face communication, of which the researcher made notes in a research diary. Observations made by the researcher were another source of information. Those were made in the form of body language, comments and participant observations, which were recorded regularly (Ellram, 1996).

Data collection	Timeframe
Meetings with company supervisor	Weekly (2 years)
Internet video conference with academic supervisor	Weekly (2 years)
Review meeting with managing director	Monthly (2 years)
Supplier analysis (reported in a presentation)	October – December 2011
Supplier visits	January 2011
Customer analysis (reported in a presentation)	February 2011
Customer visits	February 2011
Customer survey	March 2011
Competitor analysis (report format)	March 2011
Benchmarking workshop	April 2011
Evaluation of supplier relationship management (report format)	May 2011
Capabilities workshop	June 2011
Continuous improvement development	July 2012
Continuous improvement projects	October 2011 – August 2012
Risk workshop	September 2011
Process model development	July - November 2011
Process model implementation	December 2011 – August 2012

Table 15 Main sources for primary data collection

Secondary Data

In order to conduct the literature review secondary data was collected. The objective of the literature review was to gain thorough knowledge of the current status of SCM in SMEs in order to be able to develop a framework of critical aspects for implementation of SCM in SMEs for project managers and supply chain executives. For the literature

review mainly journals were used. In order to find these, databases such as EBSCOhost, Emerald Management Xtra, ScienceDirect but also search engines such as Google and Google Scholar were consulted. Furthermore, books, professional magazines and information from the internet completed the literature review. In order to refine the research several keywords have been chosen in conjunction with SCM and SCM related topics, for example:

SME
Small and medium enterprises
Small firm
Small companies
Small businesses

In total 159 academic papers were reviewed. Half of the papers (79 papers; 50%) covered SME specific issues in SCM. This complements the aim to conduct a literature review mainly based on literature about SMEs. Approximately one quarter of the papers (42 papers; 26%) covered topics in SCM referring to LEs. Change, resistance and learning were reviewed using 15 papers (9%) of which only very few were specifically written with SMEs in mind. The methodology is supported by 23 (14%) of the 159 academic papers.

Out of the 79 papers covering SME specific issues 31 were conceptual papers (39%), 23 papers (29%) were conducted using a case study approach and 25 papers (32%) were based on a survey approach. In this sample the majority of academic research about SMEs is represented with conceptual papers. This contradicts the petition of Näslund (2002) to follow less traditional and more action research. Overall, the case studies used were particularly helpful for this research as they show that SCM implementation has actually been completed and how it can be undertaken (Table 11 Case studies of SCM implementation in SMEs). The literature review followed the literature review process described by Saunders et al. (2007) (Figure 36).

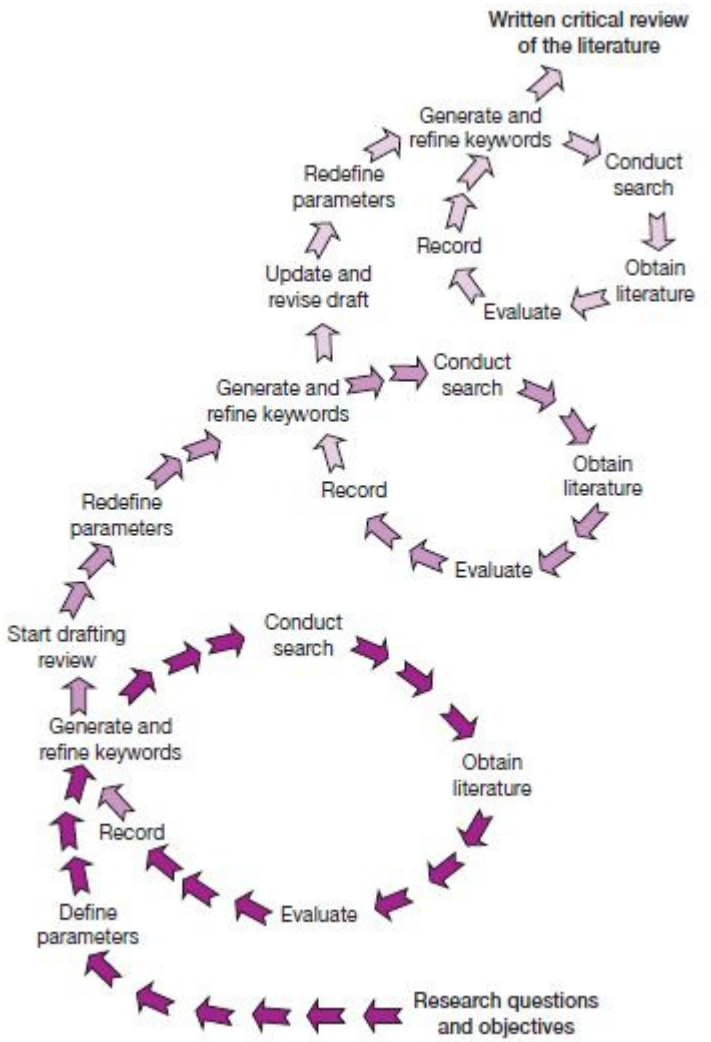

Figure 36 The literature review process

(Saunders et al., 2007, p. 56)

Further resources for secondary data included information from the company such as the business plan. Additionally, market data information from industry federations (British Plastics Federation: Polymer Distribution Sales Figures 2009; UK Market Analysis 2010) and industry consultants (Nexant: The Global Petrochemical Industry) and institutes (AMI: Polymer Distribution in Europe 2010) were used.

3.3.2 Data analysis

In order to answer research objective three and four the overall data collected during the conduction of the project is funnelled and analysed using the case analysis framework in Appendix 13 (Taylor, 1997). The case analysis framework advises looking at the supply chain structures first. This involves the material and information flow from suppliers to customers, but also organizational structures. In the next step the supply chain performance should be evaluated. Here, aspects such as the overall performance of the supply chain, customer service and cost and performance of individual logistic functions

should be considered. In a further step the business context should be depicted, which involves internal policies, corporate and marketing strategies and the external business environment. Once a bigger picture of the company situation is achieved, the main issues and problems can be identified. This serves as a basis for the generation and evaluation of alternative solutions and finally for the recommendation and justification of solutions. The framework also covers implementation of the solutions (resources, timing and monitoring). Through the usage of the framework it has been ensured, that a careful analytical procedure has been applied for the case study (Näslund et al., 2010). Also evidence for each construct has been shown and the case study tried to provide new insights (Eisenhardt, 1998). Verbal data and observations made were collected in a research diary. Similar comments or arguments were grouped in order to create a bigger picture and meaningful conclusions. Additional statements also contributed to and underpinned conclusions from other situations drawn. Conclusions also were made from the situational context, for example in meetings and conversations with staff and management. Also body language played a role for the analysis of verbal data.

Due to the analytical framework the researcher analysed the situation first and the nature of the supply chain has been depicted. “Meaningful chunks of data” have been arranged under categories. (Saunders et al., 2009, p. 492). This procedure enabled the researcher to identify patterns and relationships between data (Saunders et al., 2009). In order to complete the situational analysis the supply chain performance and business context have also been considered. The findings have been compiled in a case study. Secondly, the major problems and issues in the overall supply chain have been identified. Last CI improvement and a process model have been suggested for development and embedment of SCM in SMEs.

3.3.3 Project settings, time horizon and milestones

The project structure was given by the KTP programme. The associate (researcher) was mainly responsible for conducting and managing of the project. She was supported by the company and the academic supervisor through regular meetings and feedback rounds regarding the development of the project. In addition, regular meetings with the supervisors, a government adviser and a project chair took place. The project chair was the managing director of the focal company, who acted as a main stakeholder for the project. The government adviser’s role was to overview the progress of the project and to ensure that the grant was spent well. The meetings took place at four months intervals. At those meetings the associate reported about progress in the past, current

status of the project and next steps planned. Problems and difficulties were also discussed at the meetings.

The time horizon and milestones of the two year research are presented in Figure 37.

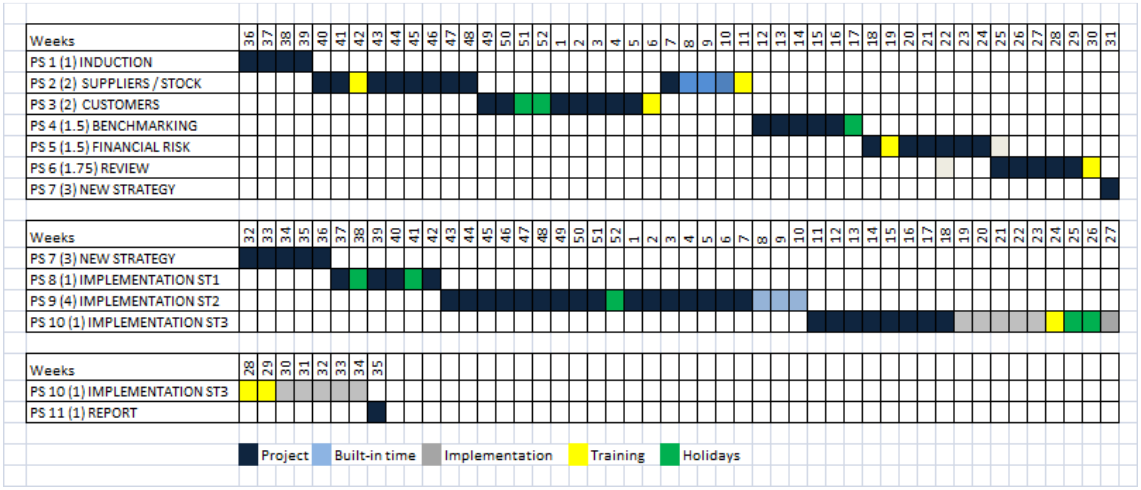

Figure 37 Time horizon and milestones

The Gantt-chart shows the 11 different project stages. It also differentiates between time used for the project, where more time was needed than specified in the project plan and when the researcher was away for training or on holidays. Project stages one to five took 11 months from September 2010 until July 2011. The stages, therein, comprised of the induction of the associate and a thorough analysis of the current situation of suppliers, customers, the relative performance, financial risk and general risk. The results were then reviewed in project stage six, which was followed by a phase where a new strategy was developed for Plastribution (project stage seven). In this stage the idea of the process model was presented and refined in cooperation with management and the management director in several sessions. The implementation of the new process model was divided into three phases. First, the process model was further refined and the prerequisites for the implementation of the process model were put in place. Then, the concept of the process model was introduced to management and the processes for the process model were reviewed and documented. Finally, the process model, process model booklet and reporting structure was launched and implemented together with management and staff in the last implementation phase. For the KTP project a final report is obligatory. Time for this report was also built into the Gantt-chart.

3.4 Summary

This chapter clarified the research philosophy, research approach and research process. The research is based on pragmatism and realism, which is reflected in the research approaches of AR and case study research. Those two approaches emphasize the

generation of knowledge from daily events derived from rich data and the involvement of the researcher.

CHAPTER 4 CASE STUDY

This chapter aims at presenting a case study about Plastribution using information and data collected during the two year KTP. By looking at the supply chain structures, supply chain performance and the business context the bigger picture concerning Plastribution's supply chain should become clear. Moreover, the case study serves as a basis for the analysis, discussion and recommendation in the following chapter, which should then enable the researcher to answer the research objective if and how SCM expertise can be developed and embedded in SMEs.

Plastribution undertook several attempts to structure and define their supply chain and supply chain activities before the start of the KTP. The results did not satisfy the managing director. This aspect and the fact that more and more of Plastribution's suppliers move their production to the Far East or Asia and therefore supply chains extend significantly were the main motivators to contact the University of Hull, Logistics Institute. It was expected that the Logistics Institute could help to develop Plastribution's supply chain knowledge.

At the beginning of the KTP, the associate experienced that staff, as well as management, were not informed concerning the aims of the KTP. Moreover, it was unclear to many employees exactly what SCM was.

This case study aims at providing a situational analysis of Plastribution's supply chain and wider aspects, such as the business context. It describes the status of the supply chain before recommendations and implementations through the KTP were made.

4.1 Supply chain structures

Plastribution started as a one-man polymer trading company in 1979. Over the years Plastribution grew and became a distributor for polymer producers and is now owned by a Japanese trading corporation. Plastribution's headquarters is located in a small market town called Ashby-de-la-Zouch in the East Midlands in the UK. A small part of the sales function and finance is based in St-Ives in Cambridgeshire, approximately two hours south-east of Ashby-de-la-Zouch. Currently Plastribution employs 42 people. Plastribution's staff is mainly recruited regionally, whereas management is recruited from all over the UK. It is reported that it is increasingly difficult to find qualified staff with a polymer background.

4.1.1 Organizational structures

The main departments in Plastribution are sales and product management.

The Sales Department consists of distribution sales and direct dales. Distribution sales mainly take care of smaller customers who buy in pallet lots which are distributed from the warehouse. Direct sales are mainly responsible for customers who buy in larger quantities which are delivered directly from manufacturers' premises. For distribution and direct sales the UK is divided into regions and one sales representative is responsible for each region. The sales representatives are supported by staff in the office in Ashby-de-la-Zouch. They are in contact with the customers on a daily basis, process orders and liaise with Plastribution's 3PL concerning transport of material to the customer.

Product management is responsible for all decisions concerning the management of stock by monitoring sales of material and placing orders with the purchasing team. Product management is divided into three profit centres according to three material varieties: commodity, engineering and styrenics. One manager oversees each of the materials with the help of one assistant.

Sales and product management are supported by purchasing and finance. Purchasing is responsible for placing orders with suppliers and overviewing and managing the transport from the supplier to the warehouse or to the customer. Purchasing and stock decisions are normally made by the product management team.

Finance mainly supports sales in credit control. Herein, finance helps to overview the invoices which are due for payment and discusses any issues concerning customers which have not paid their invoices.

In addition, a business development manager and a technical manager support sales and product management in various areas, such as the acquisition of new customers in unacquainted markets and the testing and sampling of new material.

Even though Plastribution has a clear organizational chart, some employees take over several roles, for example, quality and IT or product management and BI.

The strategic aspects of the business are regularly discussed by Plastribution's management team, which consists of eleven managers in total. The company as a whole is managed by a managing director who is also involved in aspects of sales, product management, marketing, finance, management of 3PLs and operations. Partly, he takes a consultancy role in these departments but, mostly, he is involved in decision making. He relies on face-to-face and email communication, as no reporting structure is installed. The managing director excelled in sales (with a technical education) before

being promoted as managing director. Most of the managers succeeded trough sales and have a technical background (polymer science); only few went through business education. Most of the managers approach the managing director for support in decision making.

4.1.2 Supply and demand

This section looks at the flow of material from the suppliers through Plastribution to the customers.

First, a bigger picture covering the global and European polymer market will be drawn. Afterwards supply and demand will be examined more closely.

The global and European polymer market

In order to understand the peculiarities and challenges in the polymer market, developments in the global, European and UK polymer market will be elaborated. Polymer feedstock mainly stems from derivatives of the crude oil cracking process. Due to availability and cost advantage of feedstock in the Middle East, construction of plants with very high capacities took place in recent years. A further shift of production to the Middle East and Asia is expected in the future. Conversely, production in the USA, Europe and Japan is not expected to grow and further closures of plants are likely. The top 10 players in the petrochemical industry are BASF, Dow, Sinopec, Ineos, ExxonMobil, DuPont, Formosa, Shell, Sabic and Total. They dominate the market in terms of technology development, supply and pricing (Braskem, 2011; Plotkin, 2010).

Total polymer demand in Europe amounted to 26.7 million tons in 2009. The European distribution market sized 3.1 million tons and the market value was 4,773 million Euros in 2008. The UK polymer distribution market sold 217 Kt, worth 273 million Euros sales revenue in 2009. Demand also has to be covered with imports (AMI, 2010). 8% of the processors in Europe are located in the UK. It is expected, that Polymer demand will fall from 7% in 2010 to 6% in 2015 (Reynolds, 2012).

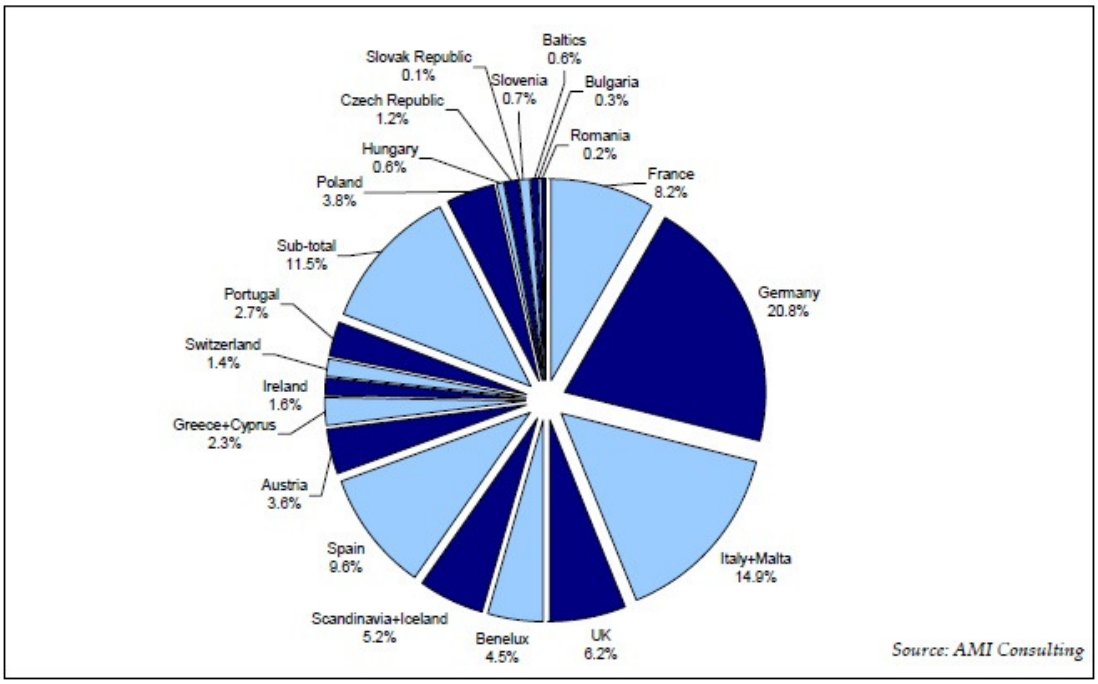

Figure 38 European distribution sales revenue 2009 by country

(AMI, 2010, p. 80)

In order to understand the position of a distributor in the marketplace it is important to point out that there is a difference between the definitions in marketing versus logistics. The marketing literature views a distributor as the link between manufacturers and their customers, whereas logistics is concerned with the activity of distribution itself. Table 16 highlights the two different definitions.

Distributor (Fill and Fill, 2005, p. 195)	**Distribution** (Chopra and Meindl., 2007, p. 75)
• "The term wholesalers embraces merchants, brokers, manufacturers representatives, agents, distributors and dealers. They are (normally) independently owned and buy products from producers and resell them to retailers, other wholesalers and end-user business customers. (…) There is a small technical difference between a wholesaler and a distributor. A wholesaler distributes products to other intermediaries but distributors sell directly to end-user customers, invariably business customers."	• "Distribution refers to the steps taken to move and store a product from the supplier stage to a customer stage in the supply chain. Distribution occurs between every pair of stages in the supply chain. Raw materials and components are moved from suppliers to manufacturers, whereas finished products are moved from the manufacturer to the end consumer."

Table 16 Differentiation between a distributor and the activity distribution

In order to put a distributor in a supply chain context it is important to understand its role in the marketing channels of a manufacturer and not to connote with the logistics definition.

Figure 39 depicts distributors as a marketing channel for manufacturers in the business to business market, next to direct selling and distribution through agents.

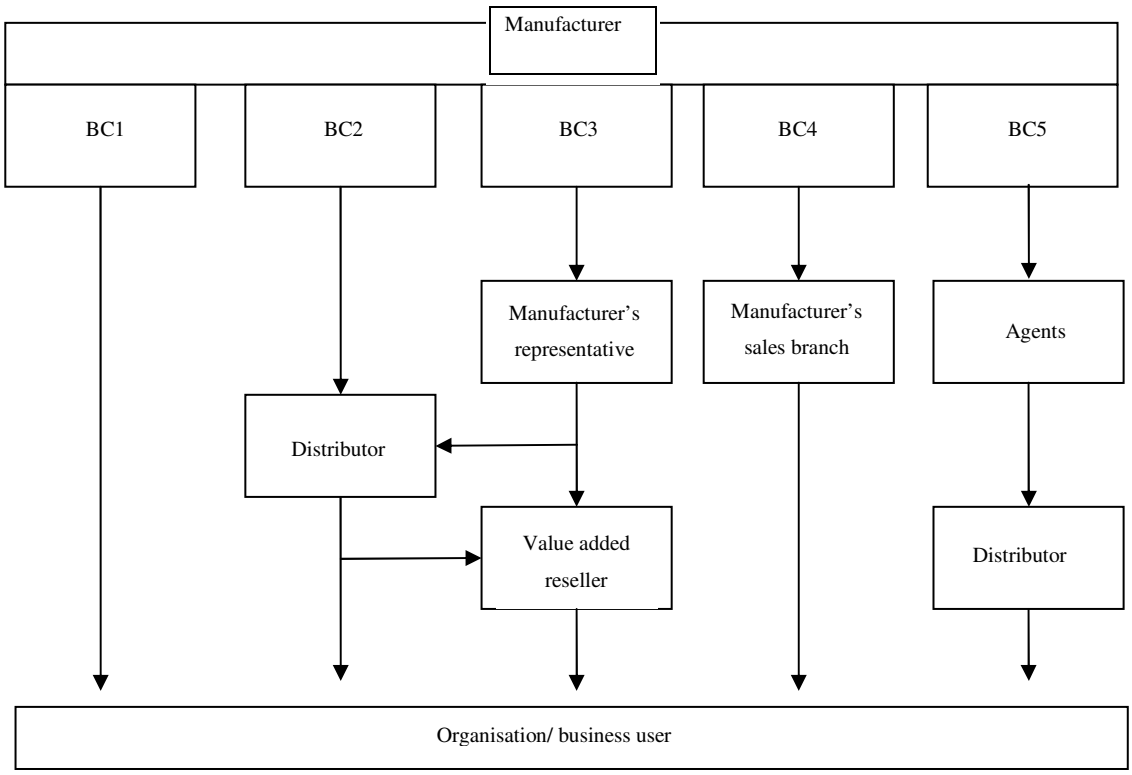

Figure 39 Levels of marketing channels for business customer markets

(Fill and Fill, 2005, p. 191)

Supply

In 2011 Plastribution obtained about 42,000 tons of material from 40 suppliers, whereas the majority of supply is obtained from four suppliers. These suppliers produce in Western Europe, the Far East and Asia. Among these four suppliers, two belong to the largest petrochemical companies in the world. The product managers buy in various quantities and achieve different profit margins. Styrenics and engineering material is purchased in lower quantities, but sold with higher profits in comparison to commodity material, which is traded in large quantities with lower profits.

The prices of polymer vary according to the developments in the oil and gas market. Therefore, especially in the last few years, the polymer market has seen fluctuations on a regular basis. Difficulties in supply vary in each profit centre. Commodity polymers are restricted and have faced constant price increases in recent years. Styrenics and engineering polymers saw relatively stable supply. Prices for these polymers are high, however only sporadic and moderate price increases are observed. Prices and availability for polymers are announced on a monthly basis. Due to the high complexity in production of polymers, suppliers experience production problems regularly. Consequently they are either not able to supply or put their customers on allocation. This inflicts insecurity for product managers as well as for customers.

SRM is not formalized in Plastribution and depends on the respective product manager in each profit centre. How closely product managers work with their supplies also depends on the proximity to the suppliers. The suppliers for commodity polymers are mainly based in Europe and have sales representatives in the UK. Therefore, the product manager for commodity polymer regularly meets the sales representatives and discusses various aspects of supply, such as expected availability for the next month, price development and availability from a long-term perspective. Also sales targets and specific customer demand are discussed in those meetings. One supplier of commodity polymers supplies from the Middle East, but sales structures are set up in the UK. As a result supply works more or less without any friction. Styrenics polymers, partly, are bought from European suppliers, but also from suppliers based in Asia. Regarding SRM the situation for the European suppliers is comparable to the situation for management of commodity polymers; meetings take place on a regular basis and current supply issues and future conditions are discussed. However, the styrenics product manager rarely meets the suppliers from Asia, as they do not have a sales representative based in the UK or in Europe. Trade shows are an opportunity to meet the Asian suppliers in Europe, but they take place on an irregular basis. Communication with the Asian suppliers mainly takes place through e-mails and is mainly focused on ordering information and less focused on discussions about future supply, relationship or price development. Engineering polymer is mainly sourced from Asia. The state of SRM here is comparable to the situation with styrenics polymer supply from Asia. SRM, also, is not distinct here and communication is limited mainly to ordering.

Plastribution does not monitor supplier performance or supplier lead-times due to constraints of the ERP system. In the ERP system no data fields for lead-time measurement exist. Lead-times from Europe are known and usually suppliers keep confirmed delivery dates. The styrenics and engineering product managers estimate the lead-times from Asia as they are not measured. As a result lead-times are anecdotal and it is up to the product manager to balance supply and demand, to have enough stock in the warehouse and not incur a stock-out.

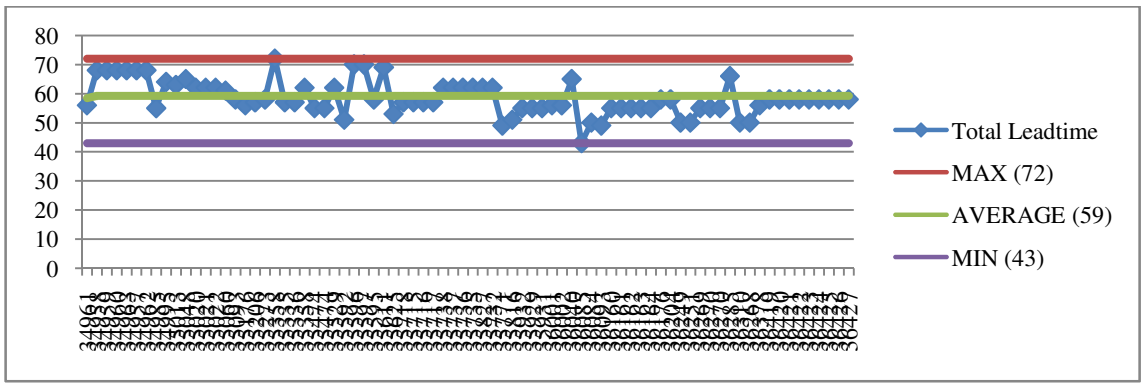

Figure 40 Lead-time deviations for supply from Asia

A manual lead-time analysis shows that lead-times from a particular Asian supplier in Taiwan (supplying styrenics and engineering material) can vary between 42 and 70 days. The average lead-time is 59 days. However in many cases lead-time seems to be longer than 59 days. Nevertheless, the lead-time can also be below 59 days. A breakdown of the lead-time also shows that the sailing time of the ships from Asia is fairly stable at 30 days. However, the time elapsing from placing an order to dispatch of the goods can vary between 15 and 42 days. The variability of lead-time is challenging for the product managers for styrenics and engineering material. They admit that they have a considerable amount of safety stock in the warehouse in order to cover the variable lead-times.

Recently, the product managers report that suppliers, more and more, request forecasting on a regular basis. Some suppliers use the information for their internal production planning; however, other suppliers base their supply allocation on the product managers' forecasting. This puts pressure on the product managers to forecast correctly.

The product managers' additional task is to consult and support sales during customer visits. All three product managers are closely associated with sales. Collaboration among product managers is limited, as the market conditions, pricing and availability issues appear to be very different. Product managers are supported by a purchasing function, which manages the purchasing orders, also, in terms of transport from the suppliers to the warehouse and customers.

Demand

Plastribution have approximately 900 customers. The majority of customers buy smaller quantities of less than 49 tons per year. On a monthly basis they serve about 280 customers in direct and distribution sales. Approximately half of the customers buy less than three different material varieties; however, there are also customers who buy up to

25 different material varieties. Most of the customers buy material from at least two of the three material varieties. From several customer visits it became obvious that customers' behaviour is very price driven. Price is the main discussion point between a sales representative and the customer. In terms of services, especially logistics services, customers do not appear to be demanding. They are content as long as the delivery arrives as ordered, that means the right item, in the right quantity, at the agreed time, with the right price and in an acceptable condition. This has been confirmed in a customer survey (see section 4.2.1 Overall performance of the supply chain and customer service). From most of the customers' points of view Plastribution is simply an intermediate point between them and the supplier. Therefore, many customers are not loyal and prefer to shop around if they can find a better offer in the market. Due to the insecurity and variability of supply customers also tend to keep their options open and usually have contact with several distributors and traders simultaneously. Single sourcing is rarely an option for Plastribution's customers.

It also needs to be emphasized that polymer is a highly technical product. There are numerous applications and processing methods. According to the different processing methods the customers' material choice can vary. Plastribution cannot stock all the different material varieties from their various suppliers. As a result, they stock the products demanded frequently. If customers demand products which are not stocked, then Plastribution struggles to import the material quickly if it is not supplied from Europe.

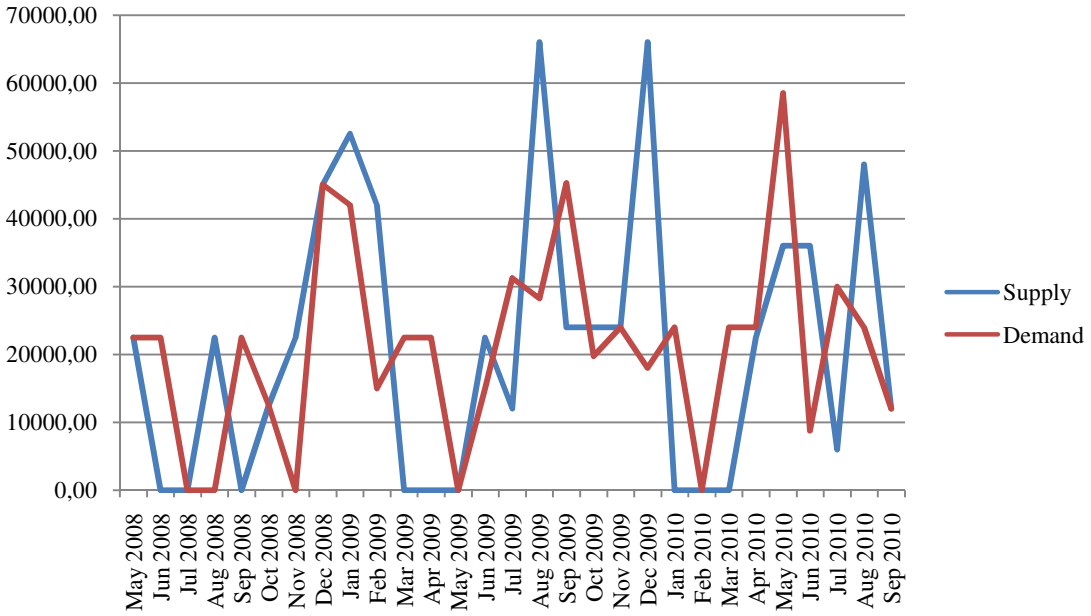

Figure 41 Comparison of supply and demand between May 2008 and September 2010

Considering supply and availability issues on the suppliers' side and irregular demand due to price, availability and loyalty issues on the customer's side, it is not surprising that monthly supply and demand in one month can vary considerably, as the example of one particular product in Figure 41 shows. At times demand and supply appear to be completely detached. This situation complicates forecasting for product managers. Due to supply issues product managers tend to hoard occasionally just in case there are availability issues in the next months. Figure 41 also depicts a rough demand pattern. In general demand is high at the beginning of the year and flattens during summer (July/August), then demand picks up again during autumn (September/October) and completely drops in November and December, as customers tend to empty their warehouses at the end of the year.

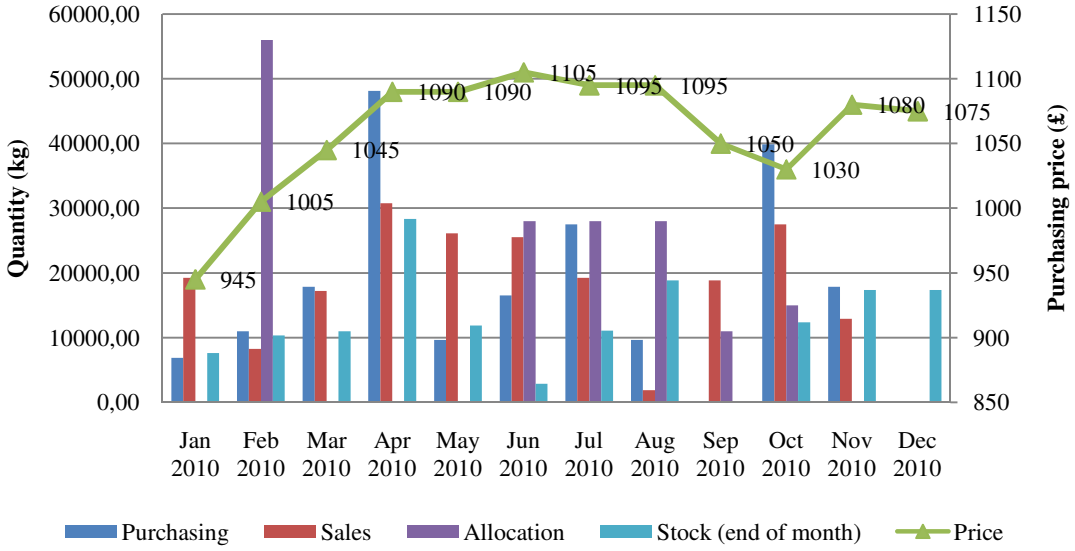

Figure 42 Comparison of purchasing, sales, allocation and stock figures with purchasing price (sourced from Europe)

Figure 42 and Figure 43 serve as an example of purchasing, sales, allocation and stock figures for two particular materials sourced from Europe and Asia. Since the data used to plot the figures is for two distinct materials it cannot be claimed that the situation is the same for other materials. The two examples serve to exemplify the challenge to calibrate supply and demand.

Figure 42 plots a similar demand pattern as Figure 41. Figure 42 compares purchasing, sales, allocation and stock (end of month) figures with the market price of a particular commodity material sourced from Europe from January 2010 to December 2010. Demand seems to be fairly stable between 15 and 30 tons, with two exceptions in February and August. The figure also gives an indication that if the price is increasing, demand tends to decrease. The purchasing decision seems to be based on sales in the

current month and the stock level at the end of the month. From Figure 42 it cannot be claimed that allocations by suppliers do influence purchasing decisions for this particular material.

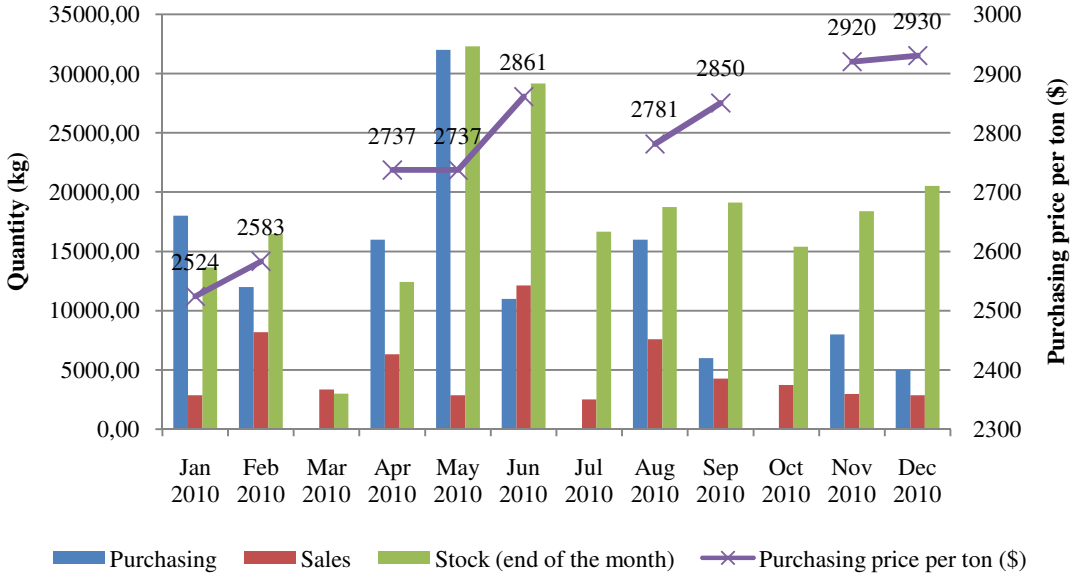

Figure 43 Comparison of purchasing, sales, allocation and stock figures with purchasing price (sourced from Asia)

Figure 43 compares purchasing, sales, allocation and stock figures with the purchasing price for one particular material sourced from Asia. Demand for the material appears to be fairly stable between 2.5 tons and 12 tons. In the majority of months demand is below five tons. Stock at the end of the months is between 12.5 and 32.5 tons most of the time and despite this the product manager still tends to order in the following month. The purchasing price seems to influence the purchasing decision slightly as the purchasing quantity has been reduced once the price has increased. This example highlights the issue that product managers do not have visibility of lead-times of material purchased from Asia, as a result they tend to order more than they actually need to cover demand.

Plastribution has outsourced their logistics functions. For warehousing, a mid-sized logistics service provider based in the East Midlands is responsible. This 3PL is also responsible for deliveries from the warehouse to the customers. Moreover, Plastribution uses three transport companies for transport of material from Europe to the UK. A freight forwarder supports Plastribution's purchasing department importing material from Asia and the Far East.

4.1.3 Information flow

This section looks at the processing and exchange of information electronically as well as face-to-face.

For the processing and exchange of information internally Plastribution uses the ERP system "Microsoft Navision", which fulfils the basic functions for customer and supplier order processing and coordination. In addition Plastribution uses the business intelligence (BI) system "Phocas", which provides ready-made templates for data analysis and allows the comparison of data within sales and purchasing to a certain extent. For data processing and analysis "Microsoft Excel" is used. IT maintenance is outsourced to an external service provider.

Departments work more or less isolated from each other and pass sales or purchasing orders on to the respective next department once their part is completed. Internal processes are mainly paper-driven. Purchasing requisitions are issued and distributed in paper format. Eventually, purchasing requisitions are put into the system and processed electronically. The processes, which are related to purchasing orders, such as booking of transport and delivery to the warehouse all are captured on paper. Sales orders are processed in the system but are then transferred to paper for checking and authorising purposes. Sales orders are transferred to a 3PL to instruct delivery via EDI.

External exchange of information with suppliers and customers is a mixture of communication via telephone, fax and email. EDI between Plastribution and their customers and suppliers does not take place.

4.2 Supply chain performance

This section will describe Plastribution's supply chain performance. In order to do so the overall performance of the supply chain and the process performance of the individual supply chain functions will be depicted. In addition, the results of three workshops (capabilities, risk and benchmarking) will be presented as a performance benchmark.

4.2.1 Overall performance of the supply chain and customer service

As described earlier, in 2011 Plastribution turned over about 42,000 tons of material, worth £ 63 million. Next day delivery is standard in the polymer industry and most of the customers expect this service and rely on it. Recently, stock-outs and related lost sales have been recorded in order to be able to judge the performance of the supply

functions. The results show that Plastribution faces less than 1% stock-outs per month. The stock turnover days are monitored closely and they are within acceptable levels taking into consideration availability issues and lead-times. As discussed in the previous section stock levels for certain products can be high at times.

A customer survey[1] conducted in March 2011 shows that customers, generally, are happy with Plastribution's services. Also, in the area of logistics and supply chain management customers rated the performance as either very satisfying or satisfying. In addition to call-off orders and consignment stock, which Plastribution already offers, customers would appreciate services such as just-in-time deliveries, repackaging of material from bags into other forms of packaging, vendor managed inventory, blending and early supplier involvement (Figure 44).

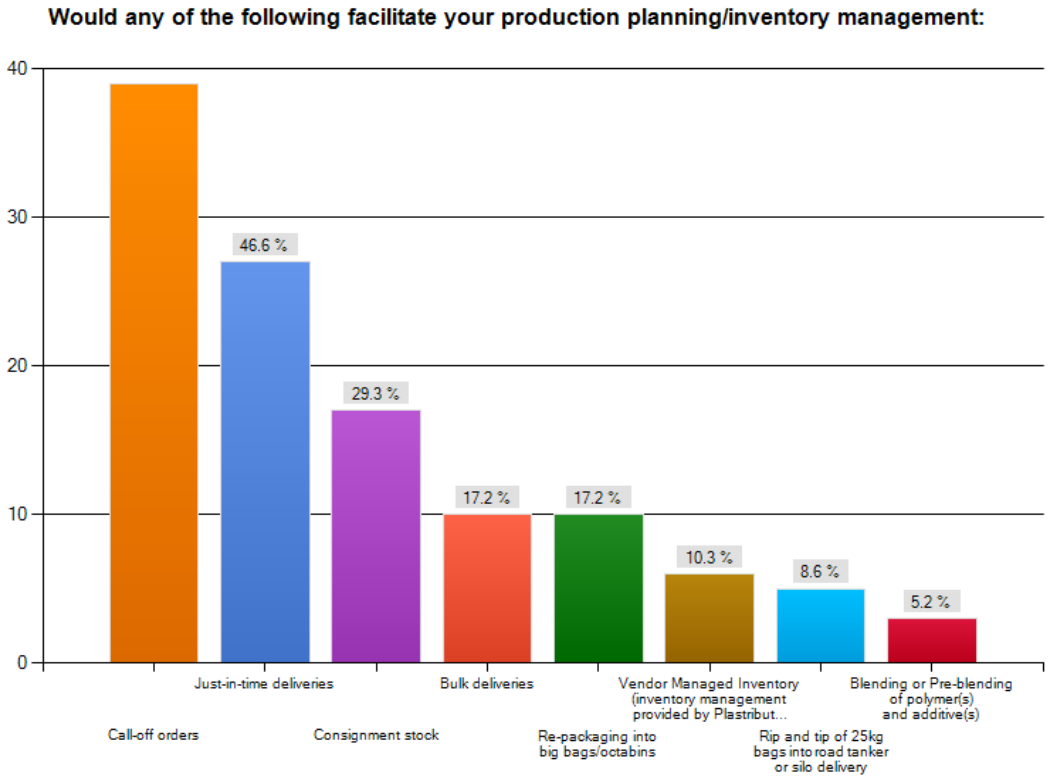

Figure 44 Additional services required by customers (from customer survey)

However, the survey also shows that customers are not aware of all the services Plastribution currently offers, as in open questions customers asked for services which already exist.

In the last five years Plastribution's performance has also been recognised by the industry with several industry awards for the best distributor of the year.

[1] sample frame: 234 questionnaires sent; sample: 82 (35%) respondents

4.2.2 Performance benchmark

Throughout the KTP three workshops were conducted, whose results will be used to benchmark Plastribution's performance. The associate prepared, conducted and evaluated a benchmarking, a capabilities and a risk workshop.

For the benchmarking workshop in April 2011 a framework by Hull University, Logistics Institute was provided. For the workshop a cross-functional group consisting of staff and management was assembled.

The following areas were covered in the supply chain benchmarking workshop:

- Supply chain integration (internal, supplier and customer integration)
- Supply chain processes (customer demand information, logistics flow management)
- Supply chain performance metrics (supply chain reliability, service quality)
- Shareholder alignment (business unit strategy reflecting shareholder objectives, supply chain strategy supporting business strategy, employees supporting shareholder objectives)

Each participant was asked to rate the performance in the different areas. The workshop identified critical areas. Ideas to alleviate critical areas were developed and prioritized in teamwork.

The results of the workshop were reviewed collaboratively and every participant made suggestions; how to improve the areas was discussed. Afterwards, the suggestions were prioritized using the matrix below.

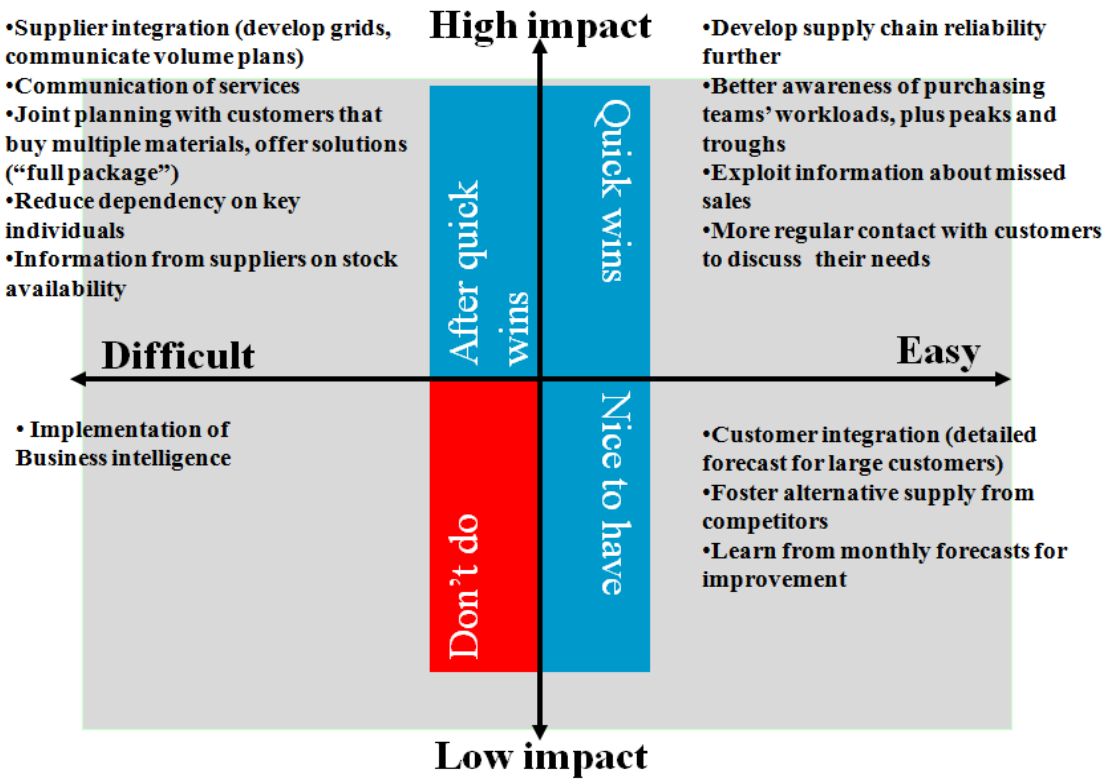

Table 17 Results from a benchmarking workshop in Plastribution

The suggestions which should be tackled first, according to the participants, were to develop supply chain reliability further, manage the workloads of the purchasing team better, make usage of information concerning missed sales, and visit customers more regularly.

Supplier integration and closer collaboration with suppliers, better communication of services to customers, close planning with customers, better distribution of workload and knowledge were rated as after quick wins, meaning that the participants thought the suggestions can be achieved fairly easily.

Customer integration, alternative supply sources from competitors and continuous improvement of forecasting was rated as nice to have, but not urgent for implementation. It also was suggested not to change the current BI tool as it appeared to the participants that this would not provide any value.

Next, a capabilities workshop held in June 2011 aimed to achieve the following:

- Defining and establishing the current core competencies
- Identifying supply chain services that would be of value in the future
- Supply chain skills, knowledge and capabilities that can generate profit from both traditional and new business opportunities

For the workshop four teams from direct sales, distribution sales, finance and product management were called. This time the teams worked together according to their departments. The reason for this team configuration was that the people working in a certain area are experts in their area and, as a result, they are familiar with the capabilities in their area the best. In order to jump-start the teams' understanding, where their work fits in the supply chain some charts with examples are prepared (Figure 45, Figure 46, Figure 47, Figure 48).

Figure 45 Involvement of Purchasing and Product Management in Plastribution's supply chain

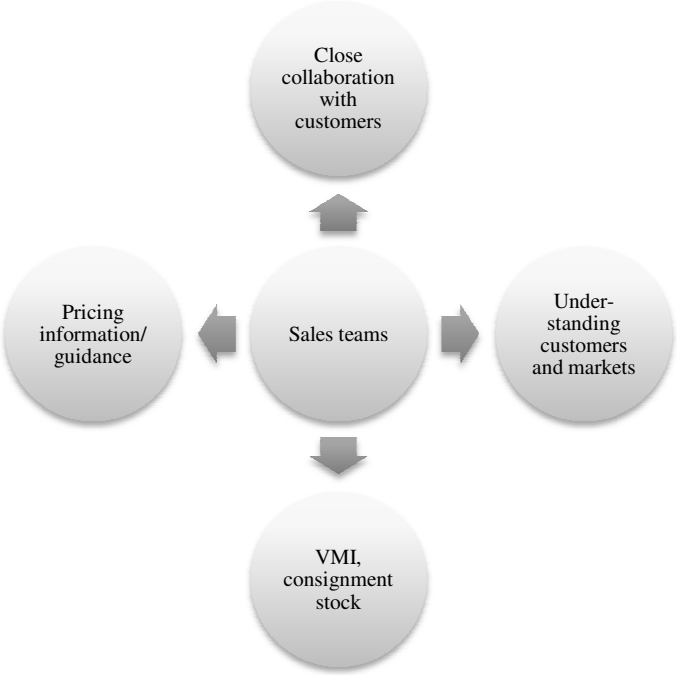

Figure 46 Involvement of Sales in Plastribution's supply chain

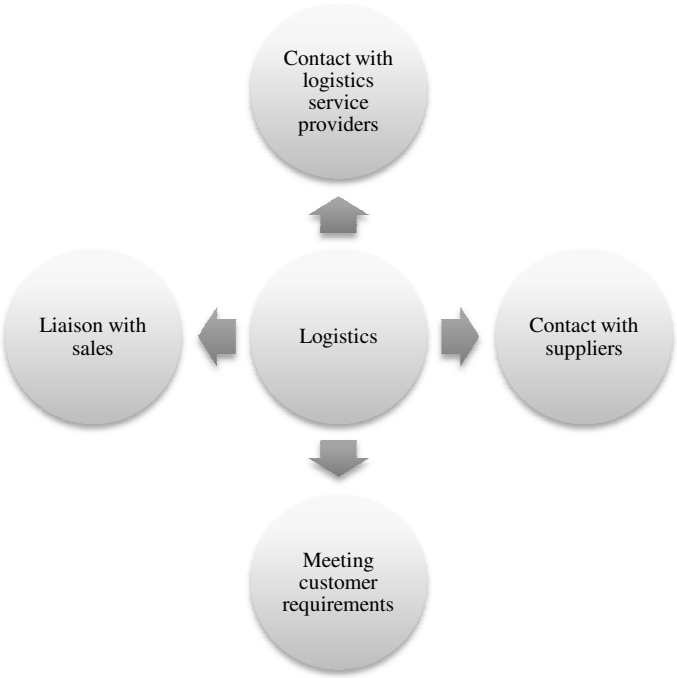

Figure 47 Involvement of Logistics in Plastribution's supply chain

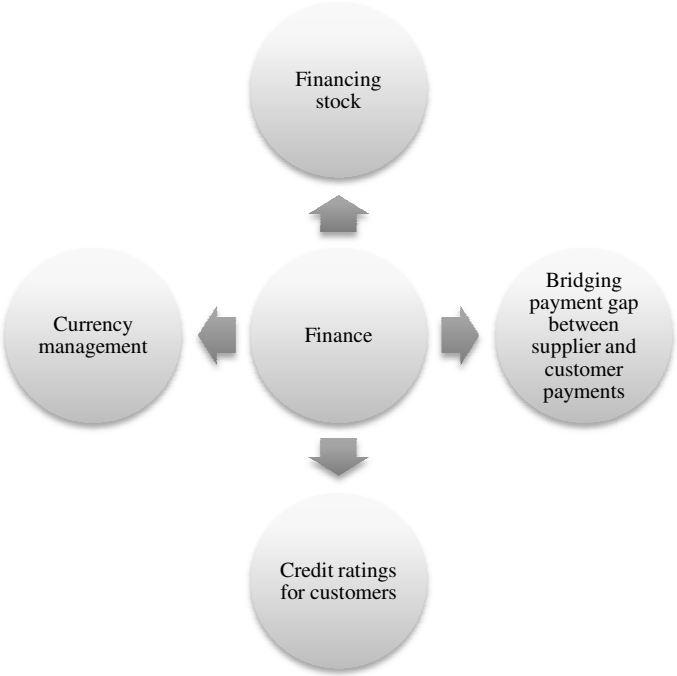

Figure 48 Involvement of Finance in Plastribution's supply chain

The teams were then asked to discuss the questions below as a team, capture ideas and results generated and then present them to the whole group.

- What are you contributing to the supply chain currently?
- What are we good at?
- How could each individual better contribute in the future?
- What could other departments contribute?
- How could we win further business?

- How could the KTP project assist you?

The results presented by the teams are summarized below (Figure 49).

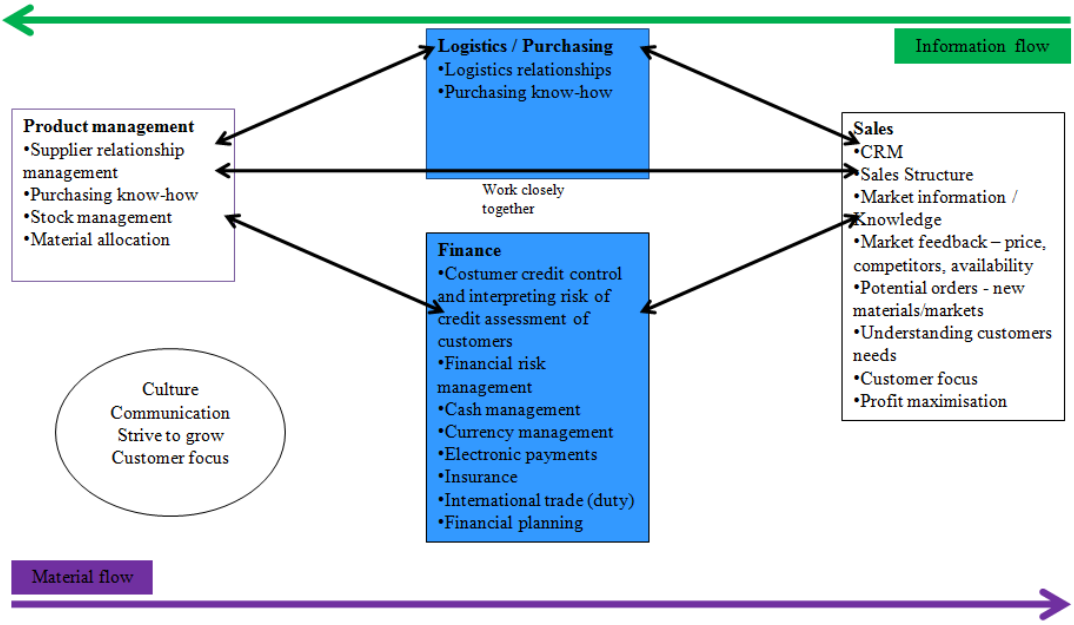

Figure 49 Results from a capabilities workshop in Plastribution

The figure summarizes the capabilities in the different departments and areas. It also shows that product management and sales drive the supply chain. Nevertheless, product management and sales are reliant on the support of logistics/purchasing and finance. Overall, all the departments work together very closely according to the teams. This complements the different departments' capabilities. Overall supply chain management in Plastribution is supported by a culture which is characterized by communication, striving to grow the company and customer focus.

The areas on which Plastribution should aim to improve, as presented by the teams, are summarized as follows:

- "We talk about things for ages, but they tend to be forgotten"
- "We have processes in the company which could do with revising"
- Time management is an issue
- People would like to learn more about what Purchasing/Logistics are doing
- Understanding how 3PLs work would enrich overall understanding of 3PLs'contribution to supply chain management

Looking back at the aims of the workshop the following two aims have not been fully achieved:

- Identifying supply chain services that would be of value in the future
- Supply chain skills, knowledge and capabilities that can generate profit from both traditional and new business opportunities

However, the workshop pointed out that Plastribution has a good basis for supply chain management which can be valuable for future business opportunities.

A further workshop in September 2011 aimed at identifying the areas of risk Plastribution is exposed to. In the workshop the areas of supply, operations, demand, competitors, environmental and financial risk were evaluated by members of the management team. This time only management was invited as the associate classified risk identification and mitigation as a management task. In order to jump-start the workshop and give the participants an idea of certain risks, examples from the news, academic literature and business literature were provided. The workshop team decided on different aspects they wanted to discuss and evaluate. Then, the aspects were assessed in terms of likelihood of an incident and weight of impact on the business.

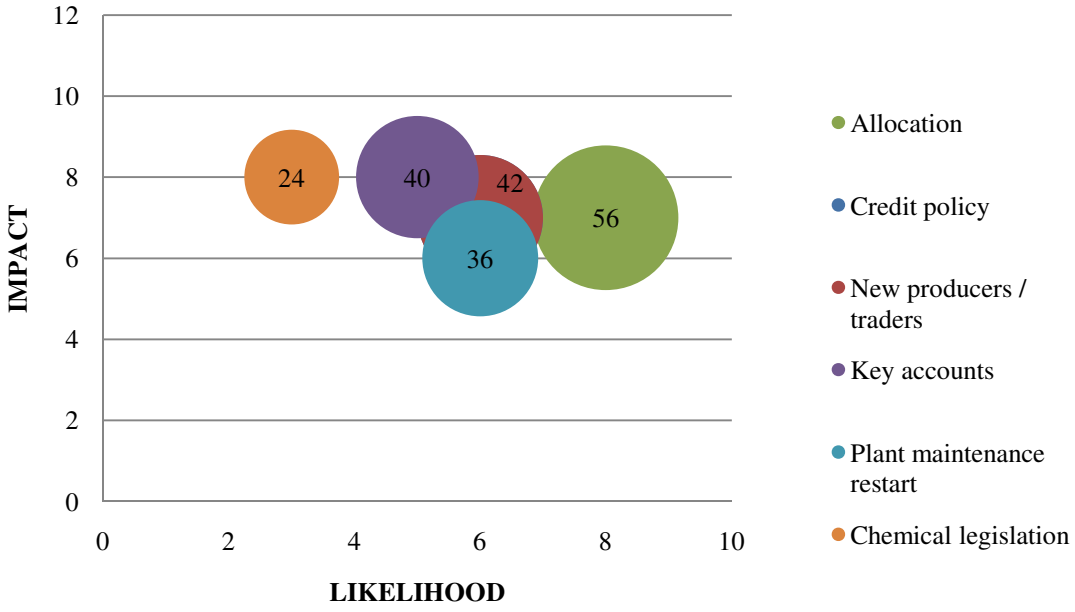

Figure 50 Results from a risk workshop in Plastribution

Figure 50 depicts that the risks concerning allocation by suppliers, Plastribution's credit policy, new traders, the loss of key accounts, plant maintenance or restart and chemical legislation are rated the highest. Herein, credit policy and new producers/traders share the same bubble as both received the overall score of 42. Finally, risk measures for areas where risk likelihood and impact are above 24 were discussed.

Allocation

It was questioned whether this risk can be influenced. At the moment, allocations by suppliers are announced completely unexpectedly. In order to overcome this it could be discussed with suppliers if schedules of maintenance could be shared with Plastribution. At the moment allocation is partly overcome by obtaining as much material as possible,

by ignoring allocations. This is sometimes achieved by “begging”. In the future strengthening of relationships with certain suppliers could be helpful to minimize the impact of allocation.

Credit policy

It was questioned whether customers are lost through the current credit policy. Some of the judgment for credit policy might be based on perception. Therefore, it might be useful to record when a customer is lost due to the current credit policy. This could be done in the credit control meetings. However, credit control is essential and currently customers might be lost since they are not desirable customers for Plastribution anyway.

New producers

The emergence of new producers in the market can be tracked through using market intelligence. Furthermore, Itochu shares information about new plant start-ups.

Key accounts

For key accounts it was stated that it is important to be close to customers continuously, through telephone calls and visits. Customers seem to be most open and honest if they can talk face to face. It was also stated that sales generally only feels partly in control since there are many other factors which affect buyers’ decisions.

Plant maintenance restart

In general it was stated that maintenance itself cannot be influenced. It is more about how the information flow and how the impact of maintenance on Plastribution are managed. One useful measure might be to log information about plant maintenance. This might help to be able to find a pattern and forecast future down times. Nevertheless plant maintenance and information flow are managed differently by each supplier. For example, it was reported that some suppliers inform Plastribution usually very early about maintenance down times. Additionally, it was reported that maintenance does not always influence supply negatively. In general it might help to know the supplier and learn from experience.

4.2.3 Process performance of individual supply chain functions

The process performance of Product Management, Purchasing, Sales and Finance will be depicted comparing the amount of purchasing orders and sales orders processed in September 2011 to the workforce available to work on the respective orders.

In September 2011, 243 purchasing orders were processed. Respectively, that means that 243 purchasing requisitions were issued by the three product managers and their assistants. The purchasing requisitions were then processed as purchasing orders by the

three members in the purchasing department (average 83 purchasing orders). The purchasing department also manages transport for the purchasing orders either to the warehouse or to the customer. On the sales side, in total, 832 sales orders were processed, of which 567 were overseen by distribution sales with 12 members and 265 were managed by direct sales with six members. On average distribution sales processed 47 and direct sales processed 44 sales orders. There is also additional workload for the purchasing team, as they also overview the direct sales deliveries (88 sales orders on average). Finance supports both sales teams in credit control with three members. As 832 sales orders equalize to the same amount of invoices this makes, on average, 277 invoices per person to monitor. A fair amount of customers pay their invoices on time and only a minority need to be managed closely. Table 18 lists the number of staff involved in supply chain activities and distribution.

Department	**No of staff**
Product Management	6
Purchasing	3
Distribution Sales	12
Direct Sales	6
Finance	4
Total	**31**

Table 18 Number of staff involved in supply chain activities and distribution

Since the main task of the product managers is to manage the stock, performance in this area will be elaborated briefly. Overall the managing director is satisfied with the stock levels and stock turnover in all three profit centres. However, there are usually some slow-movers which sit in the warehouse longer than necessary. In addition, in some cases, product managers tend to buy higher volumes as lead-times vary or the supplier is unreliable (as discussed in section 4.1.2 Supply and demand). In monthly stock reviews those stock items usually stand out. The managing director also reports that the owner of Plastribution, Itochu, has an eye on stock performance in order not to bind too much working capital.

4.3 The business context

The business context for this case study will be outlined by describing the corporate and marketing strategy in 2011, the external business environment and one particular project which involved integration and inter-organizational learning with a supplier.

4.3.1 Business and marketing plan

In September 2010 the managing director launched the so called “Dynogro” (Dynamic Organic Growth) Strategy, which is a plan to develop the business through organic growth. Herein Plastribution aims to increase the business’ turnover to £100 million by 2015. The main opportunities for growth of sales are seen with larger customers in direct sales, who buy in large quantities or full loads directly from the supplier.

Plastribution staff receives a business plan every year. In the business plan business initiatives and targets are listed. In the 2011 business plan the following areas were covered (Plastribution Business Plan Summary, 2011):

1. Develop IT Systems
2. Achieve ISO 9001/2008
3. Reduce cost base
4. Enhance logistics services and reduce costs
5. Review business procedures
6. Continually improve credit management
7. Optimize inventory
8. Develop the Films Division

In the business plan a commitment is also expressed in training (Table 19).

STATEMENT OF TRAINING AND DEVELOPMENT POLICY
Plastribution is committed to providing effective training to all members of staff. This is achieved by careful analysis of training needs and requirements of each team and the Company as a whole. The training is then matched to these needs and requirements. All training is reviewed to ensure that our training structure is continually improved. This will provide us with the following benefits. 1. Maximise the potential of our people and increase their worth to the Company. 2. Improve our collective and individual knowledge. 3. Enable our people to accept more responsibility, gain promotion and assist with their career development. 4. Ensure the future growth of our business. 5. Gain a better understanding of our Company’s aims and objectives.

Table 19 Plastribution’s statement of training and development policy

Plastribution’s marketing mainly consists of publishing technical and business articles in technical magazines and websites. Herein, opportunities for articles are identified with publishers at the beginning of the year. Then, staff who is firm in the respective areas and could provide information for an article is identified. An external public relations expert puts the information together, writes articles and liaises with publishers. Plastribution’s website presents Plastribution’s staff and management and some technical aspects.

4.3.2 External business environment

As the business environment relating to supply and demand has been described in section 4.1.2 in this section the situation with competitors will be described.

Plastribution faced considerable growth in terms of sales in the past six years and recorded a remarkable operating profit over the years. This is also reflected in the fact, that they outperformed their competitors in 2009 in terms of revenue and sales (in tons) (British Plastics Federation, 2009). In the UK market there are five major competitors who have a product offering comparable to Plastribution's product portfolio. Every month Plastribution mainly competes with them on a price basis. Regularly sales representatives report that competitors could undercut their offer to customers. For Plastribution it is especially difficult to compete with traders who do not have a product portfolio, but spot-buy almost any material which is available on the market. Often, traders sell material which is of comparable or similar quality as that of Plastribution more cheaply.

4.3.3 Integration and organizational learning

This section will report an integration project with one of Plastribution's major suppliers, which facilitated organizational learning in the form of interorganizational learning.

In January 2011 this particular supplier invited Plastribution to participate in an integration project which aimed at delivering bagged and bulk material from Saudi Arabia directly to the UK instead of transporting it to their warehouse in the Benelux area first and then redistributing it to the UK. The responsibility for the deliveries would be transferred to Plastribution as soon as the material had been loaded on board of a ship.

First of all, prerequisites from Plastribution as well as from the supplier's side had to be put in place. Plastribution had to find a partner and familiarize themselves with the requirements for container transport of loose material. The transport of polymer in containers in a so called "bag in box" solution, where polymer is filled loose in a container lined with a plastic liner, was new to Plastribution. The market for this particular form of polymer transport is comparatively small; therefore, Plastribution had not much choice regarding the partner for the container transport. Before the project could start regular meetings had to take place with the container transport provider in order to discuss the setting. Moreover, the supplier had to communicate to Plastribution

who would be their main point of contact for the deliveries from Saudi Arabia and whether their online ordering system could process those particular deliveries. For Plastribution it was particularly important to clarify the conditions for pricing with the supplier, as polymer prices change on a monthly basis. It was important to make sure that deliveries which are made at the end of the month do not face price changes even though the delivery to the UK only is made in the next month.

Cooperatively, the supplier and Plastribution had to agree the INCOTERMS[2], the compliance on European import regulations for polymer (REACH) and the most convenient port.

The supplier was prepared to share information such as recommendations for order cycles, the supplier's internal information flow and the information flow from and to the plant in Saudi Arabia, the suppliers' project plan and information about container transport and shipping in general. Furthermore, the supplier initiated several meetings and telephone conferences with Plastribution. Through the open partnership approach taken by the supplier, the exchange of information, learning and knowledge was facilitated and the project could progress quickly.

First, the project was started as a trial. After half a year the supplier wanted to continue the trial with the perspective to supply Plastribution directly from Saudi Arabia on a regular basis. Plastribution monitored the deliveries closely in terms of delivery confirmation, shipping confirmation and shipping lead-time.

Overall formalized organizational learning in the form of experience exchange or reviews plays a minor role in Plastribution. Nevertheless, some attributes of Plastribution's culture could support organizational learning in the future. First of all, there is no blame culture in Plastribution. To a certain extent trial and error is accepted in Plastribution and people who make mistakes are not punished, rather they have to take responsibility. Second, the management style in Plastribution is very much participative and, to a certain extent, democratic. Staff is listened to in most areas of decision making and their suggestions are taken into consideration if possible.

[2]* INCO –internationally recognised standard trading terms viewable on public sites like www.mwtfFiles.org.uk/incoterms/asp

4.5 Summary

This case study provides a situational analysis concerning Plastribution's business in the first 12 months of the KTP. It also clarifies Plastribution's organizational and management structure. Since Plastribution is a distributor, the organizational structure is mainly designed to foster sales. Plastribution is seen simply as a marketing channel for suppliers and a wholesaler for customers, therefore, the conditions for business can be challenging. In addition unreliable polymer supply aggravates business conditions. Analysis shows that the calibration of supply and demand is challenging for product management. Internal business processes are partly supported by IT; however orders are still partly processed in paper-format. The handling of 42,000 tons of polymer per year works smoothly in most of the cases and Plastribution is able to fulfil next day deliveries from the warehouse as a standard service. Stock-outs occur very rarely. A customer survey showed that customers are happy with Plastribution's services. A performance benchmark completed with the results of three workshops revealed that further work could be undertaken in the areas of supply chain reliability, closer collaboration with suppliers, business process re-engineering and internal integration. A further process performance analysis highlighted an imbalance of the sales and purchasing departments' workload out. In the wider business context Plastribution works with a business plan in order to pursue yearly targets. Marketing efforts are focused on publications in technical magazines. Competitors currently do not represent a threat, but make competition very challenging. Plastribution also participates in an integration project with a major supplier, which involves the transport of loose material in containers. This was a source for organizational learning and direct involvement in SCM and supply chain integration.

CHAPTER 5 ANALYSIS, RECOMMENDATION AND IMPLEMENTATION

This chapter identifies and discusses the main issues and problems within Plastribution's supply chain and recommends solutions. Moreover, it describes the implementation journey for the KTP project and concludes with a summary.

5.1 Identification, discussion and prioritization of main issues and problems

Throughout the case study some issues and problems became apparent straight away. Nevertheless, some issues and problems are more hidden and, thus, need further consideration. This section aims at identifying, discussing and prioritizing the main issues and problems in order to generate possible solutions.

From the case study the main issues and problems in the area of Plastribution's supply chain have been extracted and clustered, as in Figure 51. This section also points out opportunities within the current supply chain, where possible.

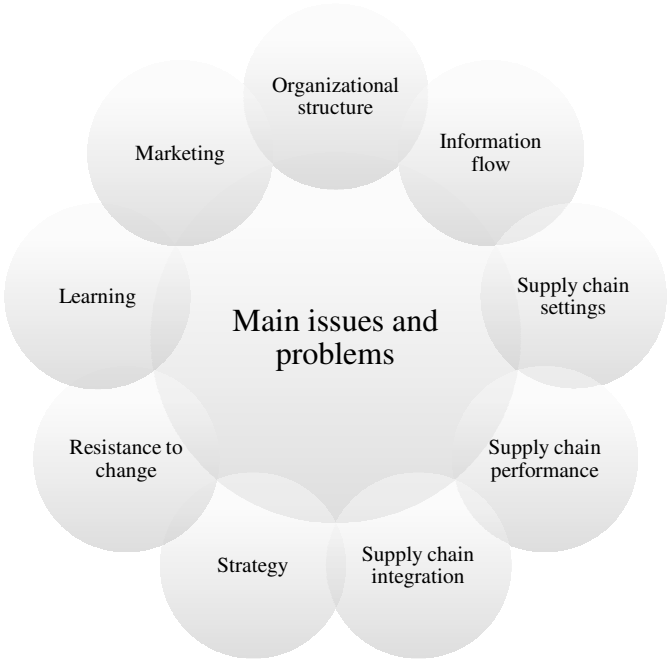

Figure 51 Main issues and problems within Plastribution's supply chain

Organizational structure

For the analysis the definition by Slack et al. (2009) is used as a basis, as discussed in section 2.1.4 Comparison of operations and supply chain management and the significance of supply chain strategy.

The managing director holds a very overarching position within the company. Firstly, he is involved in the operational business of almost all departments, except purchasing. On the one hand his experience and technical knowledge can help the respective departments to develop the business. On the other hand, without a reporting structure the management's sense for ownership of their department might be lost through the strong presence of the managing director. This is evident in the fact that some managers regularly consult him and ask for support in decision making. This way of decision making can paralyse the business, for instance, whenever the managing director is not available or on business travels. Due to the knowledge derived from the literature review the position of the managing director in Plastribution is not a surprise. In literature it is repeatedly understood that the managing director or head of a SME has a very far reaching role within a SME (El-Namaki, 1990; Morrissey and Pittaway, 2004a; Thakkar et al., 2008a).

Moreover Plastribution has grown quickly over the past few years. However, job roles have not been reviewed in the past. This becomes apparent through the fact that some people take over dual job roles, e. g. IT and quality. It is understood that Plastribution is a small company and it might not be economic or affordable to have one employee for each specific job role. Another reason might be that the managing director has not seen the need for hierarchical structures. Overall the impression is that departmental walls are blurred as some people take over several roles. This aspect reconfirms findings in the literature that SMEs' structures are less distinguished (Huin et al., 2002). This also demands employees to act neutrally, as some departmental goals contradict each other. Neutrality is difficult to achieve at times, especially in a hectic operational environment. As an example, serving the product managers who almost act in favour of sales; the role of the product managers should be to keep a balanced stock level. However, since the product managers also are involved in sales their main objective seems to be to prevent stock-outs and, therefore, in some cases stock levels are higher than necessary. Additionally, due to imprecise departmental roles managers might become overburdened by the workload, since the area of their tasks is expandable at any time.(El-Namaki, 1990; Huin et al., 2002; Pressey et al., 2009).

Despite these disadvantages, blurred departmental walls are an opportunity for good communication and collaboration as employees are used to thinking outside the box.

Overall there is no supply chain function or overarching function, which coordinates the flow of information and material within Plastribution. It is questionable whether a distinct role is economic for a SME. Nonetheless, a governance function which could overview and consolidate the most important SCM areas, such as purchasing, product management, stock management, demand management, 3PLs and sales would be helpful to foster and support SCM in Plastribution.

Information flow

This section will look at the information flow through the company's ERP system "Microsoft Navision", the BI tool "Phocas", face-to-face communication and the distribution of information within the company.

"Microsoft Navision" seems to fulfil the basic requirements for the processing of purchasing and sales orders and the support of finance. However, it does not represent all processes in these areas. For example, the process of authorizing sales orders is completed on paper. Furthermore, only fragments of the direct sales process are captured in the system; the main aspects of the process are paper-driven.

Additionally, "Microsoft Navision" impedes internal integration of processes within Plastribution as it does not replicate all processes and also looks at processes in an isolated way. For example, it is not possible to interlink a purchasing order with a sales order in the system.

Overall, it is cumbersome to obtain data for analysis and reporting from "Microsoft Navision". Partly, data cannot be extracted from Navision at all and, partly, only fragmented or isolated data is obtainable. This makes the comparison of data either impossible or data has to be amended for analysis and comparison, which can be very time-consuming. The result is that staff work their way around "Microsoft Navision" by creating their own spreadsheets or "systems" in order to obtain the data they need for routine tasks or reporting. Furthermore, the amount of reports is kept to a minimum as creation of reports is lengthy and tedious. As a result many discussions and decision-making often seem to be based on perception. The associate observed that there is a certain amount of frustration caused by the system; moreover it became obvious that some people do not trust the data obtained from "Microsoft Navision", as so much tweaking and re-arranging of data is necessary, so that the results appear manipulated and unreliable.

The partial processing of sales and purchasing orders on paper also restricts visibility and the tracking of the status of orders. Due to limitations of "Microsoft Navision" lead-times cannot be calculated and, therefore, are not visible within Plastribution. Product managers work with assumptions when they calculate the amount of safety stock to cover the lead-time. They admit that they order more stock to make sure that they do not run out. Accordingly, stock levels for material sourced from Asia tend to be higher. In the literature it is argued that increased visibility can reduce the building up of buffer stock (Christopher and Lee, 2004).

The implication for SCM is that it is difficult to obtain data concerning the performance of the overall supply chain. This is partly because the information is not captured in "Microsoft Navision" (for example, lead-times) and partly it is difficult to extract and analyse the data as described above. Overall, cross-functional data analysis appears to be an almost impossible endeavour.

The state of IT in Plastribution resembles the findings in the literature, that IT is not used to its full extend or does not fulfil the requirements for SCM in SMEs (De Haan et al., 2007; Adewole, 2005).

Reporting obtained from the BI tool is only partly useful as the BI tool provides rigid templates for certain reports. However, if data must be compared, again, tweaking of the data is necessary.

Face-to-face communication within Plastribution seems to be facilitated by Plastribution's open plant office. As pointed out in the capabilities workshop communication is part of Plastribution's culture (see section 4.2.2 Performance benchmark). In the capabilities workshop it also was stated, that through frequent and open communication they try to overcome the flaws of "Microsoft Navision".

However, it appears to the associate that at times staff has to seek for or request information actively from management or colleagues, otherwise they might miss important information, for example concerning the development of the company or future plans for their department. On the one hand, networking works in favour of a company as staff is well connected. Nevertheless, if the effort for networking uses up too much working time, then there could be a detrimental effect.

Supply chain settings

As described in section 4.1.2 polymer suppliers are very powerful and dominate the market in terms of pricing and availability. Plastribution only obtains information about pricing and availability on a monthly basis. On top of that availability issues occur on a

regular basis and allocations are common practice. Moreover, distribution is only one marketing channel among other sales options for polymer suppliers. Overall, Plastribution is in a weak supply position. Additionally, they source the majority of their supply from four suppliers, out of which two belong to the most powerful and influential polymer suppliers in the world. This situation increases dependency on suppliers and supply risk. In general, SMEs' suppliers or customers can be more powerful then SMEs, however, in the case of Plastribution this seems to be particularly aggravated since they have to deal with the most powerful petrochemical companies in the world.

Customers are generally happy with Plastribution's services but they buy based on price. Plastribution is simply seen as an intermediate point and customer loyalty appears to be low. Therefore, Plastribution can miss out on sales if the competition in the market is high and competitors undersell Plastribution. Forecasting of customer demand is difficult, as demand is irregular and very price driven. In some cases customers are not aware of all the services Plastribution offers. The question remains whether those customers would buy more regularly if they were aware of the services and the benefits to them. Overall, the situation with suppliers and customers explains why Plastribution's operations appear to be reactive rather than proactive. Plastribution have to adapt to the market conditions in order to keep their suppliers as well as customers happy.

In terms of logistics and supply chain management customers appear to be content but would require a few more services, which currently are not offered by Plastribution. Furthermore, it is questionable if the already comparatively small market for polymer distribution in the UK has much room to grow. In the future Plastribution needs to be prepared for the shift of supply and production from Europe to the Far East and Asia. One major supplier, currently, is building a plant in Asia and supply will start from there in 2015. Plastribution needs to be prepared that lead-times will be much longer from there.

Plastribution has a long-standing relationship with its warehouse and transport provider. In the past years Plastribution did not manage the relationship actively. The services they receive are good; however, the question remains of whether the provider has become too complacent over the years. Another issue is that Plastribution's account is reasonably sized with around 42,000 tons of material; however, this figure is split between deep sea and European supply and this reduces attractiveness for 3PLs. Therefore, Plastribution's purchasing power concerning 3PL's services is reduced.

Nevertheless, 3PLs could be asked to extend their services to aspects such as online tracking and tracing of deliveries, warehouse management data and alignment of processes between Plastribution and the 3PL. Plastribution transfer the purchasing and sales orders via EDI to the 3PL which eases doing business with them. The same situation is applicable to the remaining transport providers Plastribution are using for transport of material from Europe to the UK.

Supply chain performance

Thanks to the three benchmarking workshops the associate conducted, this section is not based on the associate's data analysis, perception and observation, but reflects the expertise, observation and opinion of Plastribution staff and management.

First, the outcomes of the benchmarking workshop will be discussed. The suggestions for performance improvement relating to SCM made in the workshop are listed below:

- Develop supply chain reliability further
- Supplier integration (develop evaluation forms, communicate volume plans, get availability information)
- Customer integration (joint planning with customers)
- Amend responsibilities for the purchasing team
- Continuous improvement of forecasting

The suggestions touch on all areas of Plastribution's supply chain (overall performance, internal performance, supplier and customer integration) and show, that there is room for further development and improvement. Nevertheless the performance deficiencies do not appear severe or detrimental to the business. Except for customer integration, the suggestions made can be implemented fairly easily. Customer integration appears difficult to tackle as customers, generally, are not open towards Plastribution and want to keep their options open in terms of where they source their material.

The capabilities workshop gave a clear picture of the capabilities existent in Plastribution. It also served as a reassurance for Plastribution staff, that they already are involved in SCM. Moreover, it refreshed the definition of SCM in people's minds. To the associate, the workshop proved that the basic prerequisites for SCM are in place. In addition, it was the participant's suggestion to foster closer collaboration in the company and revise certain processes. One disappointment of the workshop was that two of the aims initially set could not be achieved.

- Identifying supply chain services that would be of value in the future

- Supply chain skills, knowledge and capabilities that can generate profit from both traditional and new business opportunities

The question remains, whether it was too ambitious to give those tasks to workshop teams. Probably the task also could not be solved, because the understanding of SCM was not yet embedded thoroughly enough in Plastribution at that time.

The risk workshop shows that there are some risks, but Plastribution is aware of the risks. Since Plastribution operate in such a volatile business environment, there is the impression, that they never become complacent concerning risk. The main risks are seen in the area of supply and demand. The awareness of risks and the ability to tackle them also became obvious in the various risk mitigation strategies the management team came up with.

Overall, the results of the workshops help to form the recommendations as discussed in the next section, 5.2 Recommended solution and justification.

When looking at individual functions within Plastribution and their contribution to the supply chain, it has already been discussed that product management and sales drive the supply chain in Plastribution.

Product management has to deal and cope with a very complex supply situation. Until the start of the KTP little emphasis was given to SRM. Nevertheless the performance of product management appears to be successful in terms of stock management as very few stock-outs occur each month. Collaboration among the product managers could be improved, as they share suppliers and the expertise in terms of supply in general and polymer in particular seems to be similar. Overall, the associate has the impression that product management is very close to sales. On the one hand this may be caused by the fact that all product managers are former sales people. On the other hand product managers seem to be involved in customer liaison and support of several accounts. In this case the departmental responsibilities seem to be particularly indistinct. The question remains whether considering the complex supply market, more of the product manager's attention would be needed to focus on the management of supply and SRM. Since the majority of staff in Plastribution works in sales it should be considered to distribute the workload among sales and, therefore, less involvement of the product managers would be needed.

Purchasing clearly suffers from the imbalance of staff numbers and they openly communicated this in the capabilities and benchmarking workshop. As shown in section 4.2.3 Process performance of individual supply chain functions, purchasing oversees manages twice as many purchasing and sales orders as the respective sales functions.

The work required may vary and it is understood, that liaising with customers on the phone and via e-mail is time consuming. However, the volume of purchasing orders and sales orders managed by purchasing appears to be high. Despite the obvious overburden, Purchasing was the department where resistance to change was experienced to be the highest. When additional staff was offered to the department, it was denied that it was needed. Only over time Purchasing softened their position and agreed to the recruitment of further staff. It is assumed, that fear of job loss mainly stimulated resistance. However, Purchasing was the department where people assumed that it could be affected by the KTP the most. Since information concerning the overall aims and outcomes of the KTP was not that well communicated initially, this could have fostered resistance as well.

Supply chain integration

Supply chain integration in terms of internal, supplier and customer integration will be discussed briefly in this section.

The state of internal integration is judged differently by the associate than by Plastribution staff in the benchmarking workshop. The associate has the impression that the departments work in comparative isolation from each other. Conversely, internal integration was judged to be in a good state in the benchmarking workshop. However, in the capabilities workshop it was stated by staff that closer collaboration within Plastribution would be beneficial, in order to understand what particular departments do on a day-to-day basis. Closer collaboration would also help to understand what is involved in dealing with 3PLs. Integration with Plastribution's finance department could be partly impeded by the distance. Nevertheless communication is fostered through regular credit control meetings.

Looking back at the literature review it is not surprising that departments within Plastribution do not work collaboratively. Indeed, it was only through SCM that integration of departments was fostered (Ballou, 2007). As discussed, integration and cross-functional collaboration is one of the prerequisites for SCM (Christopher, 2005; Richey et al., 2009). It is reported that LEs struggle with integration (Storey et al., 2006), so why should it be different for SMEs? However, small companies have the advantage that they have shorter ways of communication and less staff and departments; therefore, integration can be achieved more easily.

As mentioned earlier there are almost no integration efforts between Plastribution and suppliers and customers in the area of EDI. With some customers closer planning is

practiced and as described in section 4.3.3 Integration and organizational learning, Plastribution participated in an integration project with a supplier.

Strategy

Plastribution has an objective in the form of the so called "Dynogro strategy" but not an action plan of how to achieve it. The Dynogro strategy, as described in section 4.3.1 Business and marketing plan, is to grow organically. However, according to Plastribution staff no clear action plan has been communicated on how to achieve the vision. Some staff even reported a feeling of pressure and demoralization because they do not know how to achieve the target of £100 million turnover by 2015.

Plastribution does not have a company strategy. By not having a strategy in place Plastribution misses opportunities for business growth as discussed in section 2.2 Strategy. This reconfirms the findings in the literature review, that strategy development is not common in SMEs (Ahrend and Wiesner, 2005; El-Namaki, 1990; Gunasekaran and Ngai, 2003; Isaksson and Garvare, 2003; Oakes and Lee, 1999; Quayle, 2003; Stonehouse and Pemberton, 2002).

Future planning in SMEs is often captured in a business plan (Stonehouse and Pemberton; 2002). Also Plastribution issues a business plan which states the aims and goals for the next year. More useful would be clear strategy development, which could be helpful to bundle and focus the efforts for business growth. A clear strategy could also have helped the KTP to design the project in order to complement Plastribution's strategy. Nevertheless, the business plan helps the KTP to orientate, since there is an overlap between the aim of the KTP project and the aims stated in the business plan, in terms of IT, review of business procedures, enhancement of logistics services and costs and inventory optimization. Moreover, the business plan emphasizes the importance of training for Plastribution.

Resistance to change

As described earlier, the aims and objectives of the KTP project were not clear for management and staff as communication appeared not to be sufficient prior to the start of the KTP. Also SCM appeared to be a rather complex concept to some management and staff and, therefore, understanding of the KTP project was initially impeded by this knowledge gap. This situation created an air of indifference towards the project. In the literature there are numerous reasons for resistance to change, also the lack of

information and understanding can be found in the list (O'Connor, 1993; Self, 2007; Weiss, 2003).

Once the associate started, she tried to improve the flaws of communication; however, scepticism remained for several months. The associate also had the impression that due to time constraints some managers were happy not to participate in the project as they thought SCM does not affect their department and, therefore, they do not need to participate. Often, there was a notation that SCM has something to do with trucks, warehousing and shipping, but not with sales or purchasing. It was only when the associate together with management and staff established in the capabilities workshop that every department is involved in SCM, since every department manages the flow of information or material in some way, people slowly became more open and collaborative concerning the project.

Interorganizational and organizational learning

At first sight the opportunity for closer collaboration with a supplier appeared to be fortunate. However, after a review it became obvious, that the issues and challenges overweighed the benefits.

Firstly, pricing issues could not be solved by the supplier for several months. Therefore, several times Plastribution ordered in one month, but had to pay next month's price as the goods did not arrive until then. As the price increased, this was a clear disadvantage for Plastribution. Moreover, Plastribution faced additional costs as some of the materials had to be unloaded and reloaded at the warehouse, before being transported to customers. Furthermore, it was difficult for Plastribution to make the supplier understand that customers buy in a very price-driven way and that sales volumes can fluctuate considerably. The supplier looked at average monthly sales volumes and, therefore, assumed that deliveries from Saudi Arabia would make no great difference to the deliveries from the Benelux. Here, Plastribution had to prove that sales volumes vary so considerably that, in some months, delivery from Saudi Arabia would not be feasible, as volumes would be too low.

Overall forecasting and planning appeared to be complicated for Plastribution as lead-times varied between 30 and 160 days and, simultaneously, prices for material were volatile. As a result Plastribution had difficulties forecasting demand and estimating when to place orders ideally in order to achieve a good price.

The respective product manager felt that the complexity involved clearly offset the advantage of having a streamlined supply chain. In addition motivation to pursue the

project was not very high as no cost savings could be achieved and Plastribution could not see any clear advantage for them.

Furthermore, the supplier did not give as much price compensation as needed to offset the costs incurred and make the project more attractive.

This example clearly shows that a clash of commercial goals between a supplier and a SME can make collaboration an impossible endeavour. Probably, financial support would have been beneficial in this case in order to make the integration project workable and sustainable for both parties (Bordonaba-Juste and Cambra-Fierro, 2009; Larson et al., 2005). The supplier could also have supported Plastribution in terms of forecasting by providing training or sharing more information (Wagner and Alderdice, 2006). The power imbalance as discussed in the literature seems to be detrimental to integration in this case (Arend and Wiesner, 2005; Higginson and Alam, 1997; Larson et al., 2005; Morrissey and Pittaway, 2004b).

Benefits were mainly perceived in the area of learning. Plastribution appreciated that they were exposed to SCM and deep-sea shipping and could learn a lot in the area of relationship building and service agreements with 3PLs. This learning supported the KTP project and contributed further to the understanding of what SCM is and what is involved in SCM. They also used this opportunity to further deepen the relationship with the supplier ("to receive brownie points from the supplier"). Overall, it was appreciated, that the supplier took a partnership approach and tried to support Plastribution as much as possible with information and managerial support.

Overall, learning in the form of individual personal development and training is clearly valued in Plastribution's business plan. This forms a good overall basis for organizational learning in Plastribution. Training opportunities are regularly advertised and also discussed as part of yearly staff appraisals.

Marketing

Plastribution grew from a very small trader to a distributor employing 42 people. When the KTP started it appeared that Plastribution was not used to "thinking big", even though they received external recognition in the form of industry awards. Also, industry figures clearly showed that Plastribution overtook a leading position in the distributor market in the past few years. Marketing in Plastribution did not keep up with this development and the marketing efforts undertaken appear not to be sufficient anymore. This also becomes obvious in the results of the customer survey, which shows that customers are not aware of all the services Plastribution offers. It is not surprising that

Plastribution does not invest in marketing, which is an area where expenditure cannot directly be linked to benefits.

For this thesis the issues and problems as discussed in the above paragraphs are prioritized. For the prioritization the scope and the aims of the KTP project are considered. Overall, for Plastribution, it would be beneficial to tackle all issues and problems, but the KTP project is constrained by the remaining time and not all issues fall within the scope of the project or simply cannot be tackled by the project manager.
According to the aim of the KTP project it would enhance Plastribution's efficiency to work on the aspects listed below as those areas can be influenced within the settings of the KTP.

- Organizational structure
- Information flow
- Supply chain settings
- Supply chain performance
- Supply chain integration
- Resistance to change
- Learning

How the KTP project addressed those aspects in particular will be discussed in the next section (section 5.2 Recommended solution and justification).
). Further work on marketing and strategy was ruled out for two reasons. First, the KTP is a SCM project, where marketing does not play a major role. Second, strategy as discussed in section 2.2 Strategy, should be developed and implemented from the top (ideally by the managing director). Despite the ruling out of those two aspects for the further development of the project, the associate gave recommendations to Plastribution on how to pursue those two aspects further. In the area of marketing articles and case studies about the KTP project were offered. For strategy a presentation about strategy and strategy development for the management team was offered, in order to create awareness of and buy in for strategy development within Plastribution.
The main issues and problems in Plastribution's supply chain are summarized in Figure 52.

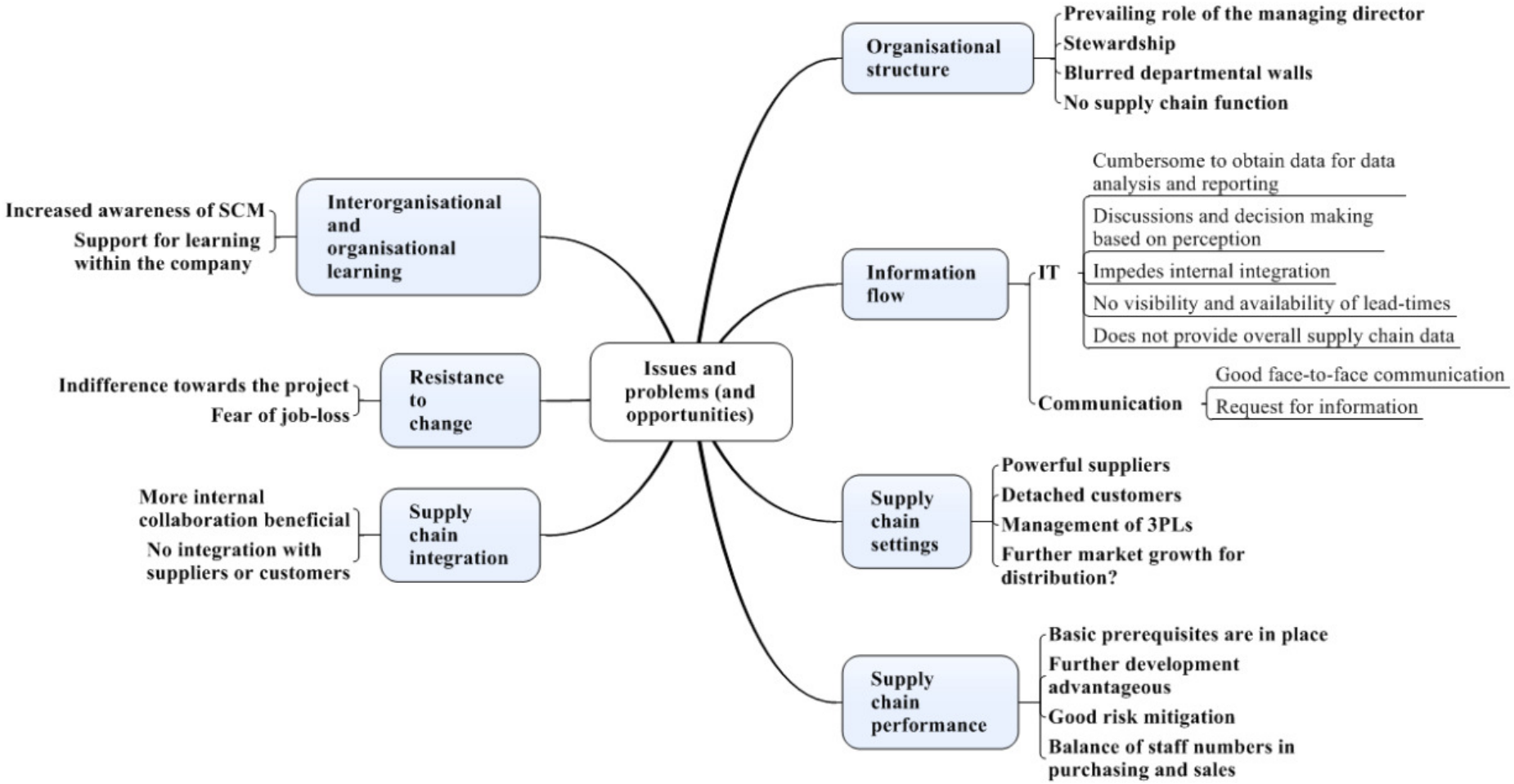

Figure 52 Summary of the issues, problems and opportunities within Plastribution's supply chain

5.2 Recommended solution and justification

The recommendations made are twofold and will be discussed separately. Firstly, a recommendation for a continuous improvement programme will be introduced. Second, a process model will be visualized as a recommendation to tackle the above issues and problems. The recommendations take into consideration that the issues and problems concerning IT in terms of information flow cannot be amended within the reach of the KTP (Figure 52). IT implementation is a very lengthy and costly process, which was not included in the aim of the KTP. Furthermore, the supply chain settings in the areas of supply and customers appear to be set for Plastribution (Figure 52). The suppliers use their power to influence the market and customers prefer to "shop around". It is estimated that improvements in those areas need to be approached with a long term perspective in the area of SRM and CRM. Since the KTP project is only a two year project it has been decided to focus on the aspects which can be influenced in the remaining time of the KTP.

Continuous improvement programme

The idea for a continuous improvement programme was an outcome of the capabilities workshop. As stated earlier participants of the workshop had the impression that Plastribution as a company tries to tackle issues and problems, but there is no agenda to pursue the issues and problems and then they tend to slow down and be swept away by other issues and problems. Furthermore, it was mentioned that some processes could be improved in order to be more efficient and clearly stand out as a capability. In addition participants suggested that it would be beneficial to work more closely with the purchasing department and also to understand better what 3PLs are doing.

Continuous improvement was recommended to address the above because of its beneficial attributes. The closeness of CI to TQM ensures the involvement of every member in the company. The focus on customers, teamwork and innovation should be of high value to Plastribution. CI is considered an important part of TQM, as it is also built on continuity, a long-term perspective and a very close involvement of staff. CI also fosters agility and readiness for change within Plastribution (see section 2.3.3 Change management and quality).

In the workshop participants made suggestions of areas which could be enhanced:

- The development of a central costumer database

- The development of tailored services and marketing of those to customers
- Revising of the induction process
- Enhancing of the information retrieval from Microsoft Navision
- How finance and SCM could collaborate more closely
- Strategy development

However, people also expressed the fear that tackling those issues could add further work to their already high workload.

According to the information and insights gained from the workshop the associate developed the idea of a continuous improvement programme. Several benefits occurred to the associate which could be gained through CI. First, if the above suggestions were tackled in teams over a certain period of time with a weekly or monthly time allowance, then this could be done in addition to the day-to-day workload without overburdening management and staff. Second, CI could help to reduce resistance to the KTP project, as participants would have the feeling that they are involved and listened to in the process of problem solving. They could also come up with solutions which suit them in their daily work environment. Third, CI also contributes to organizational learning in Plastribution, as the CI teams have to increase their expertise on a certain topic before they can actually tackle the respective project. Furthermore, the projects should be reviewed and it should be ensured that learning from experience is fostered. Fourth, CI should ideally be tackled by cross-functional teams which, on the one hand would fulfil the workshop's participants wish to collaborate more within Plastribution whilst also fostering collaboration in general. Collaboration also serves as a basis for the introduction and implementation of SCM. Fifth, depending on the individual project briefing and aim CI can help to tackle further issues as discussed in the previous section (see Figure 52), especially in the area of supply chain performance. Finally, CI contributes to the enhancement of the overall efficiency within Plastribution. Figure 53 summarizes the benefits of CI to Plastribution.

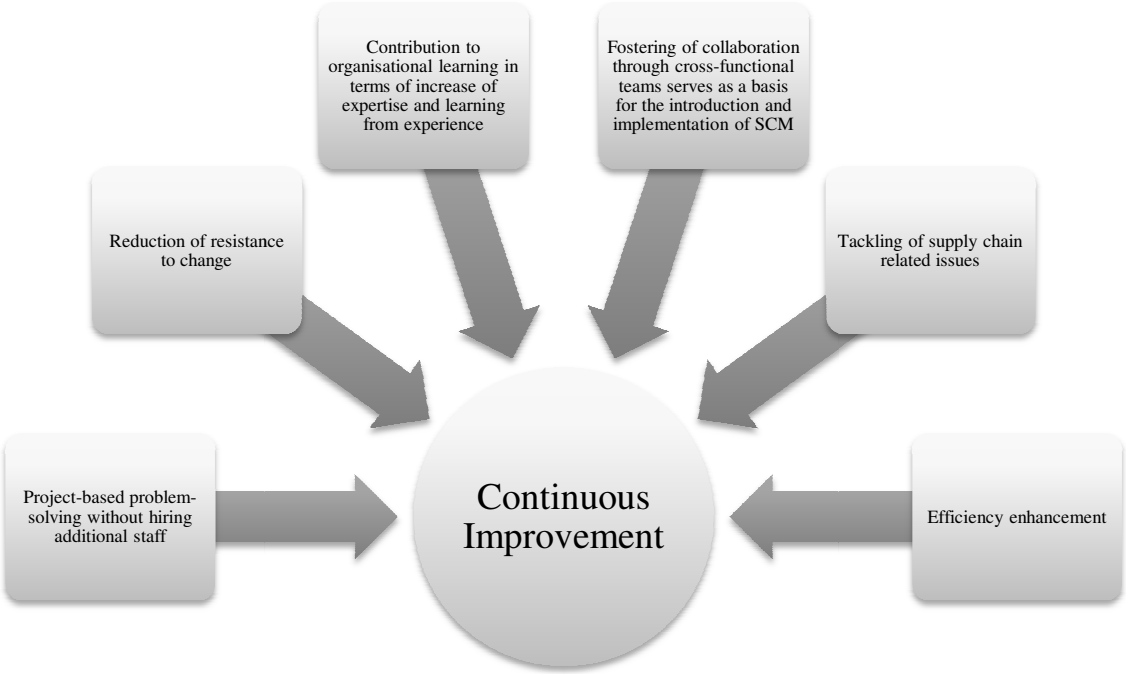

Figure 53 Benefits of continuous improvement to Plastribution

Since participants of the capabilities workshop expressed the fear of being overloaded through tackling further work in addition to their existing workload the associate suggested offering training to CI project teams. Three areas for training were highlighted: project management, managing meetings and time management. Project management training should enable the project teams to tackle their project more efficiently and not to waste time and effort. Managing meetings should support the team meetings and teach the basic structures of meetings, such as creation of a meeting agenda, minutes and noting of action points. Time management training should help people not to feel overwhelmed with additional tasks and to structure their workload as efficiently as possible. Later presentation-skills-training was added as project participants gave the feedback that this would be helpful for the result presentations (see also section 5.3 Implementation of recommended solutions).

Process Model

Initially, the KTP project plan aimed for the creation of a new business opportunity in the form of a new business model. The project manager questioned this aim in two ways. First of all the customer survey showed that customers are happy with the services currently provided. In the absence of real customer demand it is arguable if new services or offerings could be created, which would activate demand. In order to

introduce a new business model extensive marketing, also, would be necessary and it is questionable whether this would really benefit Plastribution and whether the expenses for such a campaign would pay off. Second the capabilities, risk and benchmarking workshop showed that processes within Plastribution would benefit from revising and further internal integration. This would also benefit integration with external partners, as it is proven in academic literature, that internal integration should be established first, before external integration could be tackled later (Childerhouse et al., 2011; Kotzab et al., 2011). Once this is done the established internal processes and capabilities can serve as a basis for and as a new business model in itself (for example if purchasing processes are stable, further established and mastered, then VMI could be offered to customers. Another example is management of purchasing orders. If lead-times of purchasing orders are available and measureable then a professional purchasing service could be offered to customers.)

Furthermore, the case study shows that Plastribution is in a weak position between suppliers and customers. Therefore, it is in dispute whether they actually have enough power to be able to influence and shape the market. Consideration should be given to invest more resource in internal efficiency to enable agility and efficiency as a company in order to be able to navigate and survive in such challenging, fast-moving and volatile markets whilst simultaneously managing the supply chain.

The following framework for a process model has been proposed. Processes in the areas of sourcing and purchasing, internal planning, inventory management and order fulfilment should be reviewed and documented. In a second step meaningful KPIs should be attached to each of the processes. The KPIs should deliver performance indicators which really contribute to the efficiency of Plastribution. In addition the KPIs should make sure that the processes perform within certain performance thresholds and contribute to the overall concept of the perfect order for the customer. The concept of the perfect order means that every delivery should be made under the following premises:

- Right item
- Right quantity
- Right time
- Right price
- Right condition

It is important that the process model is customer centred and always keeps the customer as a target for any initiative in mind (Figure 54).

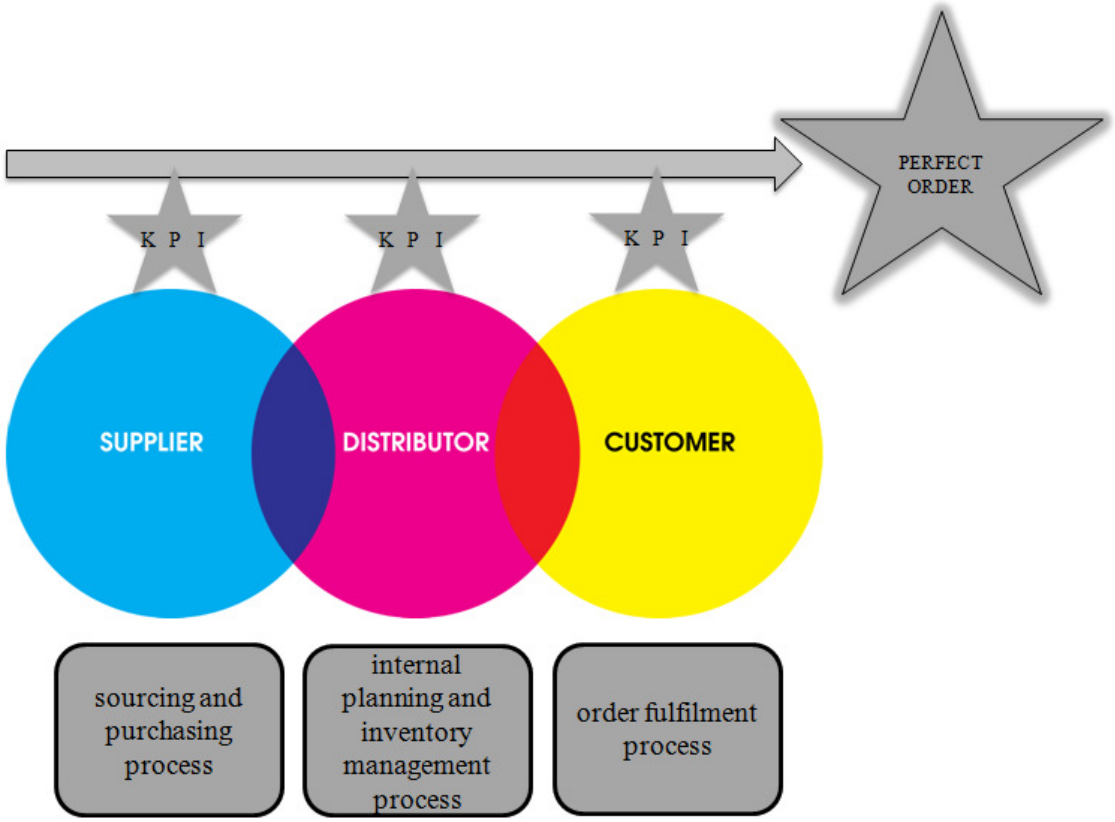

Figure 54 Suggestion for a process model for Plastribution

The process model corresponds to the issues and problems as identified in the previous section (section 5.1 Identification, discussion and prioritization of main issues and problems). It develops an organizational structure which emphasizes the most important supply chain structures; at the same time it creates a better awareness of the supply chain structures within Plastribution. In addition the new process model creates a governing function which overviews and controls the processes, which ensures the perfect order for the customer. Simultaneously, the process model links the different supply chain functions from purchasing, stock management, sales, transport and invoicing in order to target the overall aim, the perfect order for the customer. The new process model also visualizes, that SCM is the responsibility of several different areas within Plastribution and that it is not the responsibility of a single person or area.

Moreover, the process model emphasizes the importance of measuring KPIs for management instead of management by perception. At the same time the new process model steers away from the managing director's daily influence on every single function in Plastribution. Instead it creates a reporting structure in the form of KPIs, which can be checked by the managing director on a regular basis. This reporting structure also contributes to the information flow, as it ensures the information is distributed and easily accessible for the people involved. This should help to strengthen

a sense of ownership for the process model by the people involved. The KPIs can also be used for discussion with suppliers and 3PLs.

The process model also helps to establish the most important processes which contribute to the perfect order for the customer and ultimately to customer satisfaction. Therefore, despite challenging market conditions with powerful suppliers and detached customers, it helps to standardize customer service and keep the customer happy at all times.

Furthermore, the process model also enhances internal processes as it aims at reviewing and improving those. This also contributes to the improvement of internal integration and, therefore, to the efficiency of internal processes.

Regular reviews of the KPIs should assist learning based on experience. By reviewing the KPIs regularly, it should become clear what actions influence KPIs positively. Finally, the process model should also support Plastribution's Dynogro vision, as robust and efficient processes should contribute to the growth of the company.

Overall involvement of as many people as possible should help to strengthen the sense for SCM and reduce resistance to change within Plastribution.

Furthermore, Plastribution benefits from the process model as follows. The process KPIs in the process model serve as additional KPIs to the KPI "volume" which currently dominates Plastribution's operations. Among other issues volume of sales is dependent on market conditions, which cannot be influenced by Plastribution. The performance KPIs, however, can be influenced by Plastribution. And by working on them the utmost can be ensured in order to keep the customers happy. So, even if sales volumes are low, the performance KPIs should be encouraging as they help to retain customer satisfaction in every possible way. As a result, customers who are happy usually come back and this creates further sales.

The process model documentation can also be used for system development, as it depicts the most important processes within Plastribution. The documentation can then be handed to the respective IT provider, which should accelerate and sustain understanding of Plastribution's system. The benefits of the process model for Plastribution are summarized in Figure 55.

Figure 55 Benefits of the process model to Plastribution

5.3 Implementation of recommended solutions

This section will describe the implementation of the continuous improvement programme and the new process model.

Continuous improvement

By the end of the KTP in August 2012 six projects have been finished and two further projects were nearly completed. The topics for the projects were partly based on the outcomes of the capabilities project and partly further suggestions were made by management and staff. Table 20 lists the projects which have been undertaken.

Project	Start date	Finish date	Number of team members
Induction process	05/10/2011	15/11/2011	4
Purchasing requisitions	01/11/2011	16/12/2011	5
Tailored customer services	09/01/2011	30/03/2012	4
Project based sales	09/01/2011	30/03/2012	5
Stock management	28/11/2011	29/02/2012	6
Wellbeing of staff	01/05/2012	27/07/2012	5
Plastribution strategy	01/06/2012	31/08/2012	4
Plastribution values	01/06/2012	31/08/2012	3

Table 20 Overview over continuous improvement projects in Plastribution

The continuous improvement process usually starts with a project idea, which is then transferred into a briefing by the associate and the company supervisor. Before the project officially starts at a kick-off meeting, approval by the managing director is secured. Before the official start of the project a mentor is chosen for the project and the mentor is briefed concerning the content and objectives of the project.

It is routine that project teams receive a project briefing two weeks before the actual start of the project. The briefing consists of a general briefing which sets the conditions for the organization of the team, time management, the team mentor and the awards which can be achieved at the end of the year. Each team-member is allowed to use up to four hours of their monthly working hours for the projects. The project teams are free to meet when and where it suits them best as a project team as long as the meetings do not affect their regular work. Each team is allocated a mentor who supports the team if they face any difficulties. The associate also provided a guideline for the mentors in case they were not sure what their role involves. The mentors act mainly as support in the background and only engage if the project loses track. At the end of the year the management team recognizes the best projects, therefore, a description of the award procedures is included in the general briefing. Recognition is based on comprehensiveness of the project, delivery of the project on time and the overall project deliverables. Additionally, the teams receive a briefing specific to their project, which lists the members of the project team, the definition of the project, the timeframe, questions to help jumpstart the project, the ideal outcome and tools (such as internet and books) the teams might consider to use. On the start date of every project a kick-off meeting is scheduled in order to make the project teams aware of and mark the official starting date. The project meeting is usually chaired by the associate, but also members of the management team, the mentor and the managing director are present in order to

emphasize the support of the projects at the management level. Most of the teams finished within the timeframe suggested in the briefing. If the teams could not achieve the timeframe suggested, they filed a request to extend the project along with the reasons for extension with the associate.

Once the projects were completed they were presented to the management team by the project team. In this meeting steps for implementation and further sources needed for implementation were agreed. The remaining staff was informed of the outcomes of the projects in Plastribution's business update presentations given by the managing director. On the one hand this served as a source of information for staff; on the other hand this also motivated the teams who were to undertake a project in the future. After completion of the project the teams were to give feedback to the associate, in order to capture the outcomes of the projects but also to obtain any suggestions for improvement for future projects.

Table 21 presents feedback concerning some of the projects undertaken in Plastribution.

Induction process	"We worked really well as a team, and enjoyed working through the process and putting good ideas forward. We all feel very proud that we did manage to present the project well within the ***three week time frame*** and was delighted that the managing director approved the implementation without any changes."
Purchasing requisitions	"We found that the scope of this project grew exponentially the further we looked at the issues around purchase requisitions, hence why it took more time than expected to bring the project to its conclusion."
Tailored services	"We all very much enjoyed our project it was nice to be involved and make suggestions in the future of Plastribution. The project was very fitting to our roles and we felt being at the front line with customers we had a good understanding of what could be offered."
Project based sales	"The group worked well together given what turned out to be a very complex project. The grid system produced is in line with the measuring system applied to general sales accounts and therefore offers continuity in measurement. The management team now need to review the grids regarding particular projects and assign scores to them."

Table 21 Feedback concerning continuous improvement in Plastribution

As described the projects were supported by training sessions (project management, meeting management and time management), which were widely accepted by management and staff and most staff found the training helpful. The training was designed in a twofold manner. First, general knowledge and concepts were taught. In the second part participants were encouraged to use the knowledge in small projects or tasks to increase the learning taken out of the training. Since staff and management are busy and most probably will not have much time to review the training slides it needed to be ensured that the most was done in order to make people memorize a minimum of input from the trainings.

Overall the CI programme and projects were acknowledged, accepted and implemented within Plastribution quickly. People enjoyed being part of the programme and being able to contribute to the business apart from their daily routine.

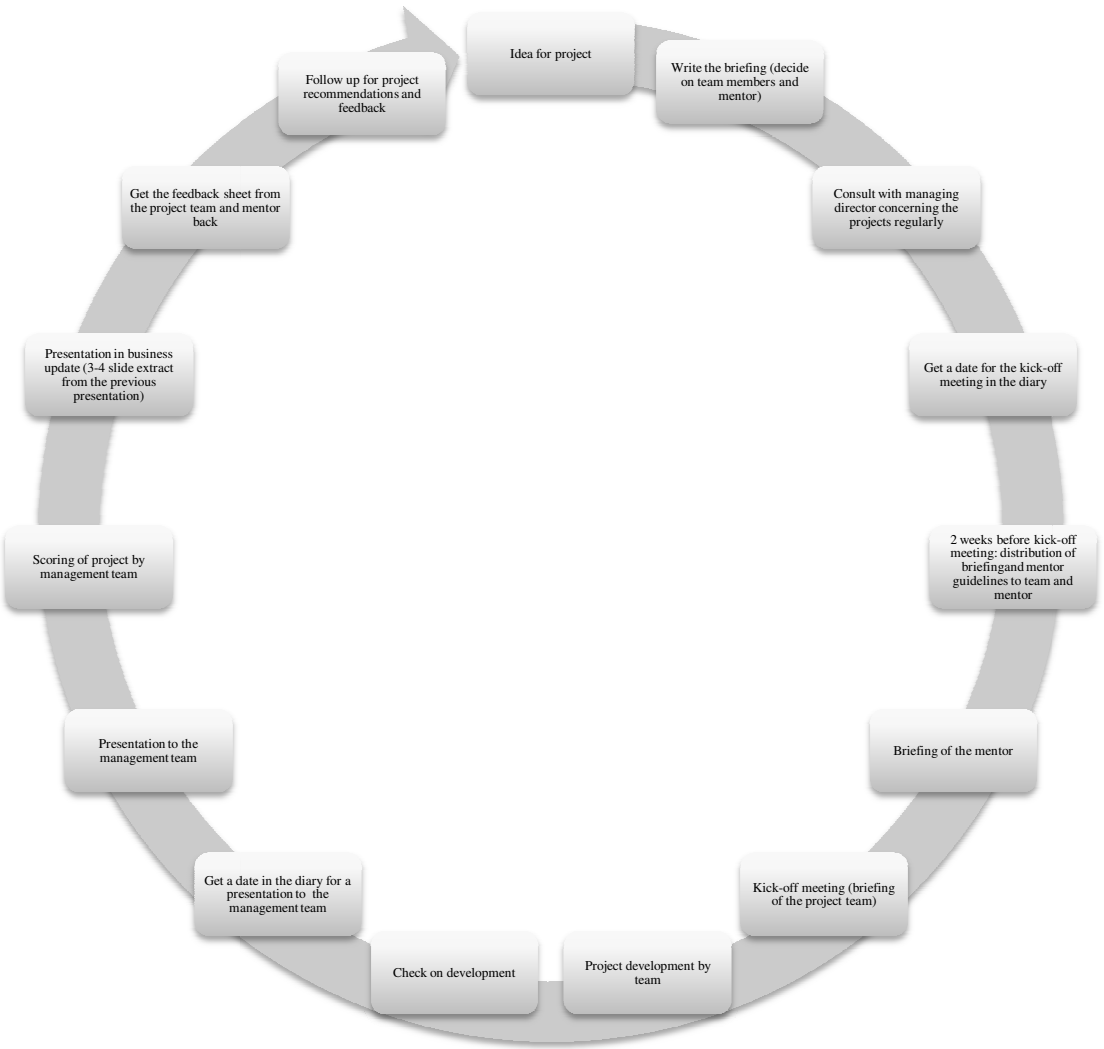

Figure 56 Continuous improvement cycle in Plastribution

Process model

The suggestion for a new process model was made by the academic supervisor at the University of Hull in July 2011. The idea of the process model was further developed in cooperation with the managing director and the company supervisor in several meetings from July 2011 to September 2011.

In October 2011 the process model was presented to the management team in order to introduce the concept of a process model, how it works and the benefits for Plastribution. Then, time was given to the management team to "digest" the idea of the new process model and buy into it before, in a workshop, they were asked to choose the processes which are most relevant to customers. The reason why the management team chose the processes for the model was to give them a say in, but also responsibility for, the process model from the beginning of the development. In a next step the processes were allocated to the areas of sourcing and purchasing, internal planning, inventory management and order fulfilment (Figure 57).

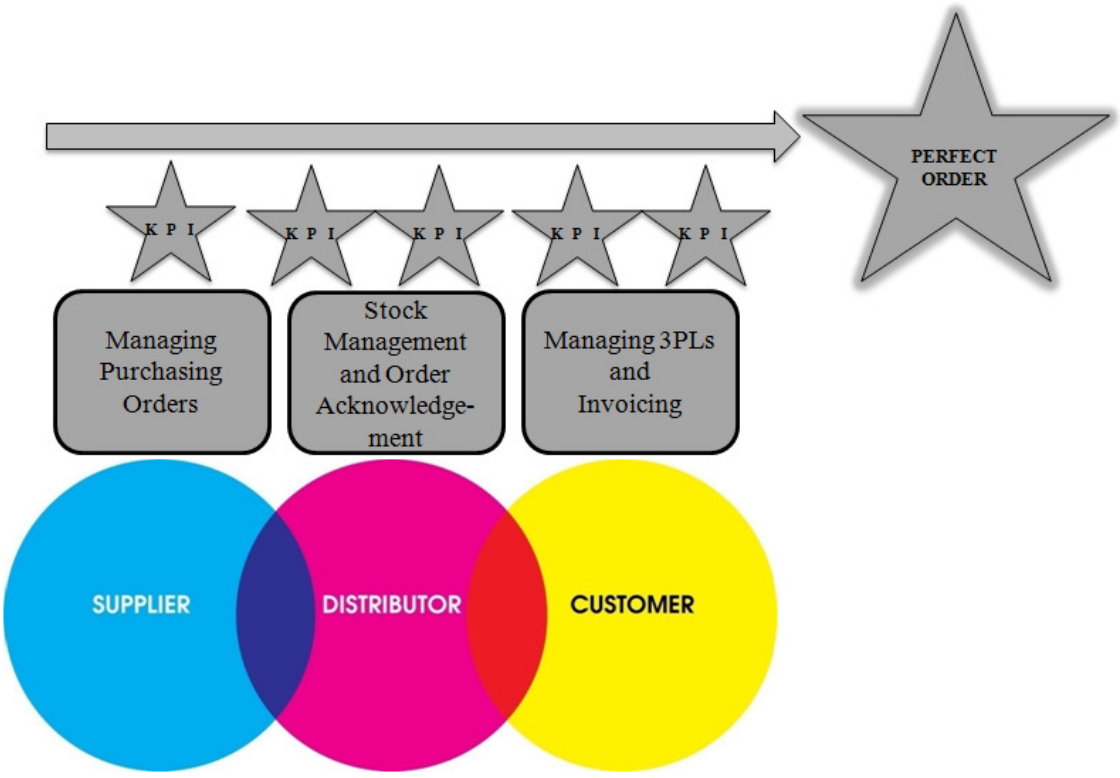

Figure 57 Five processes of the process model

The processes the management team chose are:

- Managing purchasing orders
- Stock management
- Order acknowledgement
- Managing 3PLs
- Invoicing

In the following months the associate reviewed the above processes together with the people involved in the processes and made suggestions for KPIs. Then the associate developed a process model booklet, which contains detailed information about the processes. The process model booklet consists of a general introduction to the process model, an overview of the KPIs allocated to the processes, process maps of the respective processes and more detailed descriptions of the processes. The descriptions of the processes contain the aspects as below.

- Process trigger
- Process objective
- Key process outputs
- Process description
- Key performance indicators
- Process context
- Process communicators
- What else could be done to achieve the perfect order

The above aspects will be discussed in more detail now. The process trigger captures the initiator of a process. It was also important to capture the objective and outcomes of the process, in order to focus the process. The process description serves as a complement for the process maps so that users of the process booklet have a more detailed description in addition to the process maps if needed. Even though the key performance indicators are listed in the beginning of the process booklet, it is important to capture them in the context of the process descriptions once again. The process context creates a bigger picture for the processes. The process communicators are the key people involved in the processes. Finally, the process description also gives suggestions for what else could be done to achieve the perfect order. The associate noted those aspects throughout the course of capturing the processes. Those, partly, are suggestions made by the associate but also suggestions and inputs obtained from the people who were involved in the capturing of the processes.

Finally, the process model was called a new process model, as it should not make the impression that Plastribution has not had processes in place before.

The associate suggested dividing the responsibility for the five processes between five so called “process champions” assisted by five respective reporting owners. The process champions were chosen among members of the management team. The reporting owners were chosen among staff. The reporting structure was set up as follows. The process champions are responsible for overviewing the processes and making

suggestions for improvement when needed. The reporting owners are responsible for creating the KPIs. The process champions and reporting owners meet on a monthly basis to discuss the KPIs and decide on improvements where needed.

In May 2012 the new process model booklet and the reporting structure were introduced to the management team. In a second step the new process model was introduced to the reporting owners. Afterwards the new process model was introduced company wide. The launch of the new process model was supported by a presentation about SCM, in order to recall the context of the new process model in the light of SCM and the KTP.

In June 2012 the reporting owners measured the KPIs for the first time. The associate consulted the reporting owners several times throughout the month in order to offer support where needed.

In July 2012 the first meeting of the reporting owners and process champions took place. A meeting format was used to ensure that the process champions and reporting owners focus their discussion on the KPIs. Some KPIs needed further development until they could be presented. Nevertheless, in that meeting the first KPIs were presented and the benefits for Plastribution were already apparent. In the meeting some KPIs were subject to good discussions and the participants felt that it was worthwhile to discuss the KPIs as a team.

The new process model benefits Plastribution in the respective areas (managing purchasing orders, stock management, order acknowledgement, managing 3PLs and invoicing) as follows.

Before the introduction of the new process model, it was not possible to overview or manage purchasing orders in the system. Purchasing orders were paper driven and the information relating to a specific order was captured by writing on the paperwork. As a prerequisite for the new process model the data fields in “Microsoft Navision” were extended. Those data fields can capture timeframes regarding purchasing orders, such as confirmation date of the order, date of shipping, date of planned arrival in the port, requested delivery date to the customer. From the information in the data fields a report can be created which serves several purposes. First, the report can be used to overview and manage all purchasing orders. Second it gives more visibility of purchasing orders and it enables Plastribution to access and share information about purchasing orders centrally. Finally the report should be used to generate KPIs for the new process model, but also further KPIs can be generated, which might be helpful for SRM.

Stock management was an area which was not managed formally before the KTP started. The main aspect of stock management was to monitor stock turnover days for

the respective profit centres. The product managers had their own ways of managing stock, which worked for them most of the time. Nevertheless according to the difficulties in obtaining data from the system, stock management, partly, was hindered. Also stock management did not use lead-times for their calculations, as they were not available. The lead-times can now be calculated by the above described report for managing purchasing orders. In training provided from the University of Hull and in a continuous improvement project further calculations for stock management were agreed among the three profit centres and a template for the calculations was set up in Excel. The problems with data retrieval from the system remain, but product managers hope they can be solved through a new BI tool, which facilitates data retrieval and which should be implemented by September 2012.

Order acknowledgement is an important area for Plastribution as a sales company. For order acknowledgement it is not currently possible to obtain any direct performance information from "Microsoft Navision" and Plastribution does not work with a customer relationship management system, which could probably provide performance related data. Nevertheless, it was agreed to manually monitor the time elapsing from the moment an order is received in the inbox or a phone call is received by a customer, until an order acknowledgement is sent to the respective customer. This should be completed twice a year. In addition, a new improvement tool for processes should be introduced, called process improvement efficiency (PIE). PIE aims at recording any breaking point in the order acknowledgement process in order to be able to come up with alternative solutions and prevent the system from breaking. PIE should give a sense of responsibility for processes to all staff. Furthermore, staff working on the processes on a daily basis should be the most experienced advisers for process efficiency which supports PIE.

Managing 3PLs is an area which has not been tackled before. As mentioned earlier Plastribution has long-standing relationships with its 3PLs, but they have not been managed regularly in terms of, for example, yearly price or service reviews, KPI reviews or service level agreements. The new process model gives suggestions for areas which could be managed more closely. In addition, it gives more responsibility to the 3PLs in terms of managing Plastribution's orders. Since managing 3PLs is part of the new process model it implies, that if 3PLs work well then they contribute to Plastribution's performance.

Finally, invoicing has been chosen by the management team to be a part of the new process model. Invoicing is probably a service aspect customers do not really care

about. However, Plastribution is legally obliged to invoice at the latest ten days after delivery. Furthermore, one very important part of Plastribution's business is credit control. Since Plastribution has many SMEs as their customers and it is known (see section 2.2.1 General characteristics, management and operations) that SMEs tend to struggle with cash flow, credit control is very important. SCM is also concerned with cash flow. In many definitions SCM not only consists of the management of the flow of material and information, but also of the management of cash flow. The process model suggests measurement of how many invoices are sent later than ten days and then find the root-cause for those invoices being sent later than the legal timeframe.

Overall, the new process model represents all areas within Plastribution's supply chain, which are important for the achievement of the perfect order for the customer. In addition, it links processes and shows that collaboration is necessary to achieve the perfect order. It also supports internal integration. Furthermore, it defines clear responsibility for the process champions and reporting owners. In addition it acts as an overarching supply chain function or committee within Plastribution. Table 22 summarizes the benefits of the new process model for Plastribution.

New process model module	**Benefit**
Managing purchasing orders	Visibility of purchasing orders; measurement of lead-times
Stock management	Formalized and system-based stock management
Order acknowledgement	Overall performance measurement for the process order acknowledgement; introduction of the PIE programme
Managing 3PLs	Relationship building with and management of 3PLs
Invoicing	Overall performance measurement for the process invoicing

Table 22 Summary of the benefits of the new process model for Plastribution

Table 23 summarizes the timeframes for the new process model.

Time frame	Action
July 2011 – September 2011	Development of the idea for a process model
October 2011	Presentation of the process model to the management team
October 2011 – April 2012	Process documentation; development of the process model booklet, presentations and reporting structure
May 2012	Presentation of the new process model booklet and reporting structure to the management team
May 2012	Presentation of the new process model booklet and reporting structure to staff
June 2012	Training for the new process model and KPI generation for key staff
June 2012	Measurement of KPIs for the new process model
July 2012	First meeting of new process model champions and reporting owners to discuss KPIs
August 2012	Further development of KPIs and second meeting of new process model champions and reporting owners

Table 23 Timeframes for the new process model

In a final presentation the associate summarized the main aspects of the new process model and CI in order to embed the main ideas behind the model. It was emphasized that processes need to be depicted, re-engineered and measured through KPIs. Also, it was stated once more, that SCM relies on collaboration within Plastribution but also with suppliers and customers (see Appendix 14). The associate tried to create a form of legacy for the process model in the future and wanted to encourage Plastribution to continue with the process model once the KTP project was completed.

A few members of management and staff expressed their apprehension concerning the new process model, which will be discussed below.

Members of sales feared that through the new process model Plastribution's flexibility might be lost, as the model provides rigid processes, which have to be followed. The module managing purchasing orders aiming at an economic stock level appeared to be a particular thorn in sales' eyes. They feared that stock levels might be too low and their sales might be impeded. Sales also questioned SRM. They argued that SRM does not help in a situation where suppliers are far more powerful than distributors. Plastribution rather should focus their energies on sales.

The associate showed understanding for the fears, but tried to make a point for the new process model as well. Concerning process rigidity it was argued that the processes are defined for the new process model to serve as a basis for KPI measurement. However,

this does not mean that every step has to be followed as depicted in the booklet. The associate understands that there always will be a conflict between product management and sales. She tried to make sales understand that stock has to be managed in an economic way as keeping stock ties up working capital, which cannot then be used for other purposes. The interests in a company have to be balanced and stock management is equally important as sales, as too high costs for stock keeping can eat up profits. It also was explained that SRM is a long-term investment which probably does not produce results in the short term. Nevertheless, she gave an example of one of Plastribution's suppliers where close collaboration and communication has increased trust and the material supplied increased significantly over the past years.

Application of the proposed framework during the implementation

The implementation phase was supported by the framework which was proposed in Figure 33 as discussed in the following paragraphs.

Firstly, during a lengthy analysis phase which resulted in an as-is analysis of the situation of Plastribution as described in Chapter Four the associate gained a clear picture of the IT, strategy and culture of the focal company. These three aspects build the core of the framework and are a prerequisite for SCM implementation in SMEs. The issues concerning IT could not be considered for the KTP project as it was not part of the scope and also time constraints did not allow the KTP project to look at this issue further. Nevertheless, strategy was part of the KTP project. Initially, suggestions on the development of a strategy for Plastribution were made in workshops by the academic supervisor and the associate. Those suggestions were taken up by the management team and pursued further in two continuous improvement projects. During the projects the teams received further supervision by the academic supervisor and associate. In addition, the associate gained a good understanding of Plastribution's culture as she was placed within the company for two years and was involved in the business and communicating with management and staff on a daily basis.

In addition to the understanding of the core of the business the associate brought in knowledge in the field of SCM, also she was supported by the academic supervisor. Based on the understanding of the business and the expertise in the field of SCM, three major areas of best practice were highlighted for the implementation of SCM in Plastribution: processes, performance measurement and integration. Those areas were further refined and tailored to Plastribution's needs. It was suggested to implement continuous improvement as a measure to work on minor issues and support the idea of

internal integration further. In addition, a process model should help to review current key processes and improve those where needed in order to improve efficiency and ultimately contribute to the perfect order for the customer.

The implementation was supported by the fact that the associate could pursue and coordinate the project on a daily basis. Plastribution would not have had the time and resources to implement the project without a dedicated source. It is also questioned if Plastribution would have been willing and able to invest in such a project without the KTP grant.

In addition, the associate used change management techniques which were mainly based on efficient communication and participation in order to implement the project successfully. Moreover, a learning approach supported the implementation. On the one hand the associate reflected on the development of the project and tried to enhance and adapt the project and change management approach where needed. On the other hand the implementation of the project was supported by organizational learning in the form of training and participation in the project.

5.4 Summary

Chapter 5 identified, discussed and prioritized the main issues and problems within the focal company. Issues such as information flow, supply chain settings, supply chain performance and integration, strategy, resistance to change and learning were exemplified and discussed. Based on the discussion solutions were presented and justified.

The recommendation for solution is twofold. It is suggested to implement a continuous improvement programme to enhance certain issues in a formalized and coordinated way.

In addition the implementation of a process model is recommended. The process model should support the development of internal efficiency to enable agility and efficiency as a company in order to be able to navigate and survive in such challenging, fast-moving and volatile markets whilst managing the supply chain simultaneously.

Finally, the implementation process is depicted over a two year period. The implementation of the continuous improvement programme and the process model is particularly highlighted.

Since the KTP was successfully completed the associate is able to look back at the implementation phase in the next chapter. Herewith, the associate reflects on the project

and fulfils one important step of learning. This also reflects the framework in Figure 33 which emphasizes the importance of learning during SCM implementation in SMEs, but also permeability of knowledge between the technical aspects of a project (for example processes and performance management) and the formal aspect of a project (for example project and change management) must be given.

CHAPTER 6 DISCUSSION

In the following chapter further aspects such as the project development, the implementation phase, supporting aspects and the knowledge transfer will be enlightened and discussed in further depth in order to support and further extend the knowledge gained in chapter five.

In the Introduction the research aim and objectives have been set.

The research aim was stated as follows:

- To establish how supply chain management expertise can be developed and embedded in a SME that will both enhance the efficiency of the existing business and create an additional business opportunity

The research objectives were

1. Review the latest academic literature concerning supply chain management and implementation of supply chain management in SMEs
2. Develop a framework of critical aspects for implementation of supply chain management in SMEs for project managers/supply chain executives
3. Conduct a case study of a two year supply chain management KTP project
4. Derive from the case study how supply chain management expertise can be developed and embedded in SMEs

The first research objective has been achieved in the literature review (Chapter Two). The literature review concluded with the presentation of a framework for the implementation of SCM in SMEs, which fulfils research objective two. The framework recommends having the basics for SCM in the form of IT, strategy and understanding of the culture in place before SCM implementation can be started. An understanding of the culture is important as SMEs are different from LEs and, therefore, their characteristics can differ significantly from LEs' characteristics. For project managers, who did not work with SMEs before, this aspect is particularly important. The understanding of the SME's culture enables project managers to develop a solution which is tailored for the SME. As SMEs lack resources to develop SCM it is important to tailor solutions for them so that they can work on the most prevailing issues. This ensures that they are not overburdened with the additional task of SCM. Company strategy is an important source of information in order to understand the company's plans for the future. Strategy also helps to tailor the supply chain solution for a SME. IT is the heart of SCM and is an important prerequisite for the implementation of SCM in SMEs. Once the basics are in place initiatives such as performance measurement, integration and

processes can be implemented fairly easily. This should be supported by change and project management. Continuous learning ensures progress and needs to be fed back into the project and SCM development continuously.

In Chapter Four a case study regarding the KTP project was presented, from which recommendations were derived in Chapter Five. This corresponds to research objective three.

The aim of this chapter is to extract from the case study in Chapter Four, and the analysis, recommendation and implementation in Chapter Five the key aspects, which facilitate the implementation of SCM, in order to establish how supply chain management expertise can be developed and embedded in SMEs which is the fourth research objective of this thesis.

6.1 Project development

When the associate joined the company it appeared that little previous communication about the KTP project took place before its commencement. Staff and management were not aware of the aims of the project. In addition, SCM was a concept people had not encountered and they found it difficult to grasp. It is assumed that those two aspects led to indifference and resistance among staff and management. People with a heavy workload tried to avoid the project in order not to neglect their area. Additionally, they could not or did not want to make the connection between their function and SCM. Resistance might have been caused by lack of information about the project and a lack of knowledge about SCM.

In addition, in the beginning, the project did not have a champion who clearly supported the project in Plastribution. Since the associate was new in the company she did not have the relationships and standing to establish and drive the project from the beginning. The managing director who initiated the project did not drive and market it at the beginning of the project. The company supervisor, who wanted to drive the project, did not have sufficient time for the project initially. This aspect changed once the outcome of the project was more visible and tangible and, consequently, the company supervisor, as well as the managing director, valued it more.

The situation also changed when the associate had more regular contact with management and staff through the workshops, training for the CI programme and the CI projects. The associate obtained feedback that people enjoyed the workshops, training and the projects. The workshops encouraged staff to be involved and signalled that their

expertise and opinion was valued. This seemed to create trust and acceptance for the associate as well as for the project.

Before the workshops the associate mainly analysed data and presented the results. The change from a consultative to a more participatory approach appears to be one of the reasons why management and staff attributed more meaning and attention to the KTP project. Clearly they preferred to be directly involved in the project and be able to form the project, rather than just read reports and listen to presentations about the project.

In order to increase the understanding of SCM, the KTP associate reduced SCM definition to a single statement (Bagchi et al., 2000): SCM in Plastribution is the management of material and information from the supplier through Plastribution to the customer. Furthermore, she exemplified it with an example taken from Plastribution's supply chain, rather than an example taken from a SCM book. The associate used the same definition and example of Plastribution's supply chain whenever it was needed. The associate feels that through repeating the message continuously, the concept was slowly understood and knowledge retained. This also reflects individual learning, where it is best to repeat new contents as often as possible in order to establish them and be able to repeat them.

The CI programme provided an important basis for the new process model in several areas. First the idea of cross-functional collaboration was established through CI. The cross-functional approach was an important basis for the new process model and embedded the idea of SCM internally further. The CI programme also proved to management and staff that SCM is achievable and does not require too much time or resource. Second, people became used to taking further responsibility in addition to their daily workload. People also accepted that project based working in Plastribution actually works. The projects which were already completed also showed that in a project setting pending issues can be tackled and valuable and entrepreneurial solutions can be found. Through the CI programme they also learned that their input and opinions are valued. Overall the associate experienced a great preparedness and willingness to contribute to and work on the new process model together with the associate. Moreover throughout the process of documenting the processes the associate obtained substantial input and ideas from all staff and management involved. In the end the process champions and reporting owners were happy to take over responsibility for their areas and they took their tasks seriously. This became obvious in the first meeting of the champions and reporting owners, where all participants were well prepared and contributed to all areas of the new process model actively (Figure 58).

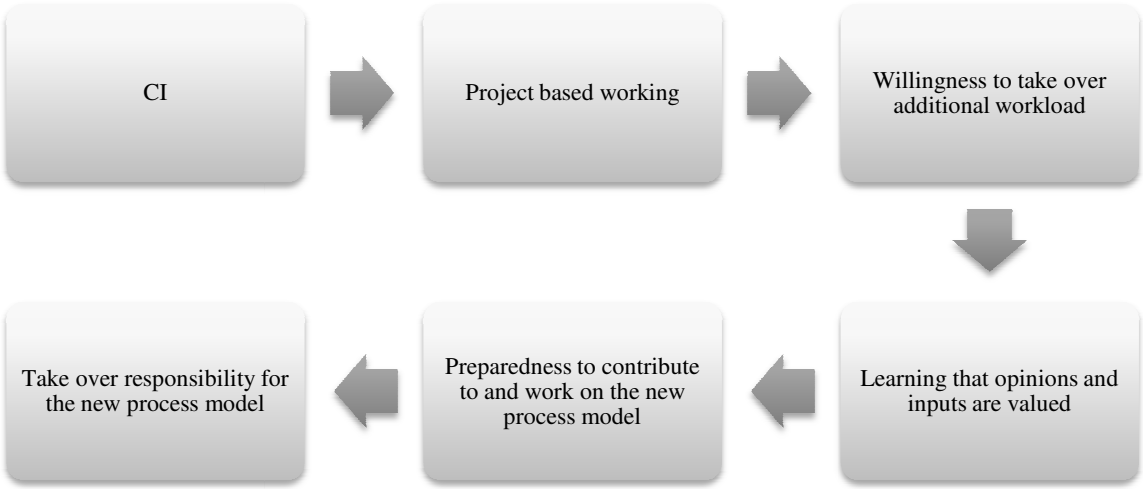

Figure 58 Continuous improvement as a basis for the new process model

The managing director stated as an achievement of the KTP, that cross company collaboration resulting in opportunities for increased efficiencies, better use of the ERP system and savings on increased overhead was achieved. Ultimately he attested a change in company culture from top down management to one of close collaboration and participation across departments. He called the new process model a 'game changer' for Plastribution's goal to grow the business in the next few years. Ultimately, he confirmed Plastribution's new self-image. "We progressed from a sales-focused company to a supply chain management company. In the past we saw our strengths in sales, but now we realize that we actually do supply chain management and that it contributes to our business in many ways."

In retrospect it would have been beneficial to the project if more emphasis had been given to knowledge transfer in the first few months of the KTP. Early understanding of SCM and what is involved in it could have reduced resistance to the project (see also section 6.4 Knowledge transfer). Another aspect which could have helped to manage resistance in the early stages of the project better is the incorporation of change management in the project plan. This could have been done either through training for the KTP associate or through the incorporation of specific change management tools in the project plan, such as TQM, CI or BPR. Training for the associate could have helped the associate to understand reasons for resistance and how to embrace and reduce resistance in order to be an effective change agent from the beginning of the project. It is understood that through the prescription of change management tools the experimental character of the project would have been affected, however, it could have given the associate a direction how to handle resistance and manage change. Moreover, since the participatory character of CI worked so well, the project could have made use

of this aspect much earlier. In general change management should have been incorporated in the project plan, because resistance is very likely in any change situation and, therefore, it is deceptive to assume that it will not occur. Resistance, rather, should be embraced and managed from the beginning. With the right feedback structures in place it can be used as a valuable source of information and input from management and staff; and, therefore, it can help to develop a project.

6.2 Implementation

For the project implementation it was helpful to take an action research and action learning approach, which is also recommended in papers (Choueke and Armstrong, 1998; Clarke et al., 2006; Powell and Houghton, 2008). Action research and learning is characterized by regular feedback, involvement of the participants and constant monitoring and evaluation. This ensured that the associate did not simply pursue the ideas she thought might advance the project, but she actively sought feedback which ensured that the solution suited Plastribution as a company. Furthermore, the suggestions were thought through and the action research cycle ensured that the path for implementation was relatively slow, since the associate had to reflect and evaluate every step taken before taking the next step for the project. This was an advantage as it gave staff and management the time to digest change suggestions before they were actually implemented. This also prevented people from feeling overwhelmed by the pace of change.

For the development and implementation of SCM implementation in Plastribution the KTP setting in itself was helpful. Firstly, the aim of KTPs is to transfer knowledge from the universities to companies. Since SCM was slightly alien to Plastribution the transfer of knowledge was an important aspect of the project as it secured buy-in and understanding of the project. The academic supervisor was understood as a trusted source of knowledge. Also, it was accepted that the University of Hull is a centre of excellence for SCM and management emphasized the value of this source. The knowledge transfer ensured that staff and management could contribute to the project in the later stages. Second, it was helpful to have an extra resource in the person of the KTP associate. Since workload is high and human resources are scarce in Plastribution, it was important to have a project manager who could pursue the project on a daily basis. However, it is questionable whether Plastribution would have employed a SCM project manager if they were not involved in the KTP and the KTP was not sponsored by a grant. The role of the associate as a project manager is seen as crucial for the

advancement of the project. The associate pursued the project on a regular basis and ensured continuity. Therefore, drive, motivation and momentum were not lost. This secured the evolving character of the project, but also made sure that the project was completed.

6.3 Supporting aspects

Throughout the duration of the two year KTP several changes were made in Plastribution. The changes were partly initiated by the KTP associate and partly they were part of Plastribution's business plan. Either way, they contributed to or supported the project.

Within the first six months

Firstly, an integration project was initiated by a supplier as described in section 4.3.3 Integration and organizational learning. This project helped to visualize SCM and what is involved in SCM for Plastribution. Although Plastribution mainly judged the project negatively and the disadvantages of interorganizational learning mentioned in the literature were confirmed, the project showed in real-time what SCM actually means and involves. This understanding supported the introduction of the new process model.

The KTP associate also pointed out the importance of supply for Plastribution. The associate introduced the idea of SRM to management. As a result Plastribution made use of their expertise in customer development and used a grid, which was originally used for customers to evaluate their suppliers. As a result, they started to see the relationships with their suppliers from a more strategic point of view. It was also emphasized that relationships with strategic suppliers needed more strengthening through regular visits, information exchange and alignment of goals. It highlighted that, especially, strategic suppliers from Asia should be targeted, as SRM was not yet practiced with them. Overall it was realized that SRM is important for securing supply. Moreover, this also assisted to balance initiatives within Plastribution between supply and sales.

After 6 months

In September 2011 Plastribution reinvented itself completely in terms of marketing. Plastribution's brand image was overhauled and redefined.

Figure 59 Plastribution's old and new brand image

The new brand visualizes with the three colourful circles Plastribution's role as an intermediate between suppliers and customers. The new brand clearly supports the supply chain thought. According to the new brand all marketing material was rebranded. In addition, a new website was developed. The website emphasizes Plastribution's closeness to customers and introduces the sales teams to the customers in detail. Furthermore, the website is a source of information for customers concerning Plastribution's product and service portfolio. Along with the new brand Plastribution's image was sharpened more distinctively which worked in favour of the KTP project as some of the aims of the project could be aligned to the new brand image.

The KTP project aligned the new process model to the three areas developed in the new brand image (see also Figure 57 Five processes of the process model).

The rebranding was helpful for the KTP project as it restates Plastribution's role in the supply chain and cements the company's importance in the supply chain. As part of the new marketing material the KTP associate had the chance to promote the project in the quarterly company magazine "Know How" in three articles. In a brand movie Plastribution also promotes their expertise in SCM.[3]

After 18 months

The KTP project finally achieved high recognition among management, which was reinforced through the business plan for 2012 (Plastribution, 2012). The business plan stated "To complete the KTP and embed the learning into the organisation, including the use of Continuous Improvement Projects." The mention in the business plan promoted support and focus for the KTP project further, which was very helpful for the development of the new process model and its implementation.

In the last six months of the project product management and purchasing was further developed and promoted in two ways. First, after a refurbishment of the office the product managers and purchasing were located closely together so that, now, information exchange and collaboration easily take place. Second the purchasing team was extended. An operations manager was appointed who also takes care of the purchasing department. Additionally, an apprentice was recruited to support the team

[3] Please refer to http://www.youtube.com/watch?v=p6gitagQJnk

with their daily workload. This works towards a more balanced number of staff in purchasing and sales and also ensures the development of purchasing capabilities in the future.

Furthermore, two CI projects tackled by members of the management team aimed at developing a strategy and defining Plastribution's values. This should be very helpful for Plastribution's future development as it gives a framework for all initiatives in Plastribution. Initiatives can be aligned to the strategy and, therefore, they can complement the strategy. Since the company grew significantly over the last two years (seven additional employees were recruited) it is a worthwhile exercise to review Plastribution's values to observe where the company stands and whether the existing values support the strategy and future plans.

In the last six months of the KTP project a BI tool was also introduced, which should help to extract data from "Microsoft Navision" more easily for analysis. This, however, does not extinguish the flaws of "Microsoft Navision" in terms of internal integration and total process coverage. IT is an essential prerequisite for SCM as highlighted several times throughout this thesis. In order to support SCM and develop it further, IT is necessary and it is doubted that "Microsoft Navision" can perform adequately.

6.4 Knowledge transfer

In this section the aspects which supported the knowledge transfer in particular will be discussed.

First of all, enjoyment of the training, CI projects and involvement in the new process model promoted the knowledge transfer. People liked being involved and recommended the training and participation in CI to colleagues.

Another important aspect was to reduce the abstractness of the training and presentation material to a minimum and use less technical but more day-to-day language (Bagchi et al., 2000). The associate used the same definition of SCM in every presentation and training she gave. On the one hand this helped not to confuse people with too many different definitions; on the other hand this helped to embed the definition. Supply chain management, in many ways, is applying common sense and that is the gist which needs to be taught to non-supply chain staff, in order to help them understand the basic supply chain concept.

Furthermore, the training and presentation slides need to be designed so that the knowledge is processed and memorized during the presentation. People are generally busy doing their jobs and rarely have time to review presentation slides. Therefore, the

key message needs to be clear and easily memorised. As a result staff understand the concept of SCM and can apply it to their operational tasks or CI projects if needed.

Trainings and presentations should be interesting and designed as a dialogue rather than a monologue. By asking questions and asking for feedback or personal experiences people stay focused. The trainings and presentations also were tailored to Plastribution's business and contained many examples taken from day-to-day business.

In retrospect, it would have been beneficial to the project if more emphasis have been given to knowledge transfer in the first few months of the KTP. This could have given the project a boost and ultimately could have affected effectiveness. Effectiveness of the project was not very high during the analysis phase, as the associate mainly worked on her own and was rarely involved with management and staff. Knowledge transfer mainly could have comprised aspects concerning SCM in order to create better understanding of the concept (Brau et al., 2007; Soinio et al., 2012; Quayle, 2003; Thakkar et al., 2008a). The training sessions could have been tailored to the different departments in order to clarify their involvement in the supply chain. Furthermore, visits to the warehouse and 3PLs could have helped to make SCM as a concept more tangible for management and staff. Involvement of the whole company from the beginning would have been very helpful for the project development, as SCM is sustained through collaboration among departments. The associate who had recently graduated with a Masters in SCM was not experienced enough at that time to design or provide training on SCM. The University could have given insights here as the Hull University Business School offers executive training and should be familiar with the requirements of staff and management concerning SCM. It is believed that better understanding of SCM could have softened resistance to the project earlier and staff and management could also have contributed to the project from the beginning. It is assumed, that the early involvement of management and staff could have led to earlier results in the project and, therefore, the final project result could have been even more sophisticated than the current results achieved.

Knowledge transfer was also supported through double loop learning. Double loop learning requires dissociation from the current status and redefinition of the problem (Bessant et al., 2003). Plastribution achieved this in two ways. On the one hand CI supported double loop learning. Here, issues which were discussed in Plastribution in the past were taken and redefined in the CI project briefs. Also it was ensured that the CI teams had the freedom to develop new ideas and be creative. Therefore, they could

evaluate the issues from a different angle. As a result new ideas and solutions were created for long discussed issues.

Also, the new process model was supported by double loop learning. Through the recruitment of the associate new ideas concerning SCM were brought into Plastribution. The associate helped to redirect the more traditional and transport focused view of SCM towards a more holistic view of SCM. This helped Plastribution to dissociate from their current issues in SCM and see them in a wider context. With the new process model a solution was created which covers the whole supply chain and not only supports sourcing from suppliers from the Far East and Asia (the initial objective of the introduction of SCM in Plastribution), but provides a comprehensive model, which covers the whole supply chain from suppliers to customers and helps to increase efficiency at the same time.

6.5 Implications for embedding supply chain expertise in SMEs

This section aims at answering research objective four and tries to answer the question of how SCM expertise can be developed and embedded in SMEs. Furthermore, it discusses how this thesis contributes to the existing body of literature.

As discussed in section 2.4.2 Framework, and in other parts of this thesis the development of supply chain management definitely profits from an additional source in the form of a project manager. The development is facilitated by knowledge transfer, embedment and reflection on knowledge and through change management in various forms. The framework suggests that performance measurement, the focus on processes and integration (internal and external), can be achieved fairly easily by SMEs.

With the new process model a solution for SCM has been found which reflects the three aspects of performance measurement, process focus and integration. The basis for the new process model is processes, whose performances are measured through KPIs. Through the new process model internal collaboration, and as a result internal integration, is promoted. The new process model also attributes the importance of suppliers and customers to Plastribution which is reflected in three processes in the model. Ultimately, these processes can also contribute to closer collaboration with suppliers, but also with customers. The new process model has been tailored to Plastribution's needs, by choosing the processes which are most relevant to Plastribution's customers and affect the supply chain at the same time.

The process model can give SMEs an advantage in terms of SCM compared to LEs, as some of the LEs continue to struggle to implement SCM or a SCM function

(Childerhouse et al. 2011; Storey et al., 2006). The process model represents the overarching concept of SCM and governs the supply chain at the same time. It gives managers a dual role as manager of their department and representative of the process model. As a result it ensures that the supply chain thought is implemented in a company. This kind of model might work better for SMEs than LEs as they have an advantage compared to LEs in terms of communication. In SMEs communication channels are short and often face-to-face, overall communication is quicker.

Comparing Plastribution's sales turnover, profit before tax and number of employees of 2009 with the figures achieved in 2011 (15 months financial year due to change of end of the financial year from December to March) it is apparent, that Plastribution grew significantly. After calculating the 12-month average for 2011 it becomes apparent that Plastribution managed to increase their sales turnover by 35%. Moreover, profit before tax was more than doubled within two years. In addition, the number of employees increased from 39 to 46. How much of the growth can be attributed to the KTP cannot be confirmed. Nevertheless, the researcher is confident that, partly, the success of the company has been supported by the KTP and the change initiatives taken.

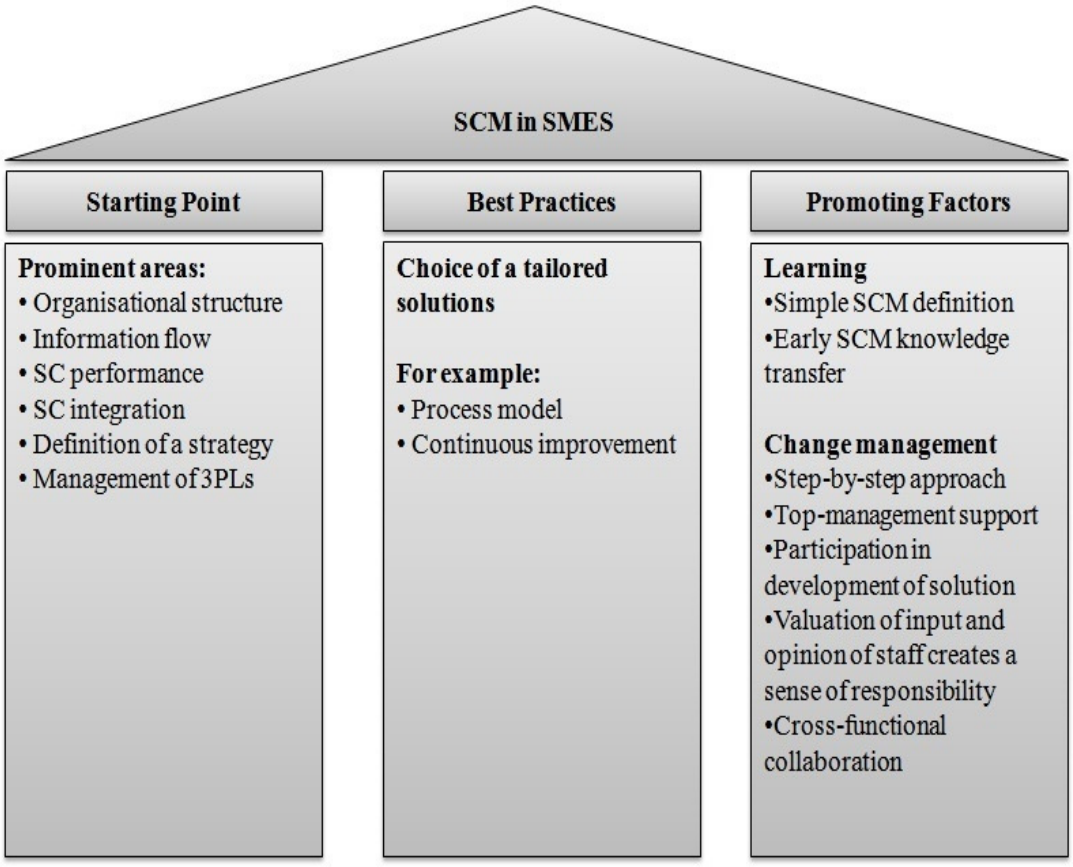

Figure 60 Important prerequisites and factors for implementation of SCM in SMEs

Certainly CI improvement and the process model have contributed to Plastribution's efficiency and effectiveness and, ultimately, to growth. Moreover, it is assumed that the

change undertaken motivated management and staff to go beyond their personal boundaries. Figure 60 summarizes the most important aspects derived from this research concerning implementation of SCM in SMEs. From the case study it can be derived that improvement areas which can be tackled through SCM in SMEs are the following: organizational structure, information flow, SC performance, SC integration, definition of a strategy and management of 3PLs (as discussed in section 5.1 Identification, discussion and prioritisation of main issues and problems). Furthermore, from the case study it became apparent, that best practices which have been implemented in LEs can also be helpful to SMEs. Nevertheless, they need to be tailored and not too many initiatives should be run concurrently. In order to create an early comprehension of SCM a simple definition of SCM and early knowledge transfer concerning the most important aspects of SCM is important. Participants in this particular research preferred a participatory style for the development of the solution for the company. Herewith, enjoyment seemed to be an important factor. Throughout the project, management and staff learned that their opinion and input was valued and this created a sense of responsibility. This responsibility contributed, later, to the fact that the SCM solution implemented was easily accepted by management and staff. Finally, cross-functional collaboration embedded in an SME helps to implement and sustain integration and serves as a basis for SCM implementation. In order to foster cross-functional collaboration in this particular research CI was chosen, which worked well and contributed to efficiency improvement. Throughout the implementation a step-by-step approach ensured a moderate speed of implementation, which helped management and staff to become used to the SCM solution. The implementation was eventually facilitated by top-management support.

The application of the framework as proposed in Figure 33 during the implementation phase could result in business competitiveness on a long term perspective. In this particular project the focal company benefited from the framework as it ensured a formalised approach to the analysis of the current state of the business by pointing out core areas of the business such as strategy, IT and culture. The development of the solution for the SME was focused on key areas for improvement which are processes, performance measurement and integration. Furthermore, the implementation was supported by change and project management and a learning approach.

It is estimated that the focal company can gain business competitiveness from this approach as it is assumed that few SMEs, so far, have reviewed their processes with a perspective on SCM. In addition, it is assumed that CI is not that common in SMEs due

to the lack of knowledge on how to implement CI. Once the benefits of the process reviews are further embedded through the continuous review in the monthly meetings of the process champions and process owners this should be a powerful tool for the company for governing their supply chain. It is also assumed that through a learning approach and the participation of a large number of management and staff during the development of the process model the embedment is fast tracked as people already know the concept and also have a sense of ownership for the model. Overall, this contributes to business competitiveness in regard to other competitors but should also increase the recognition of the focal company among suppliers and customers.

6.6 Summary

This chapter emphasized once more the importance of understanding and involvement of staff for the development and embedment of SCM in SMEs. It also pointed out, that a step-by-step approach might be slow, but helpful for implementation, as it reduces resistance. Knowledge transfer should be tailored to the needs of staff who do not have a supply chain background. Furthermore, knowledge transfer needs to make a strong impact in the classroom. A process model is a good measure to implement SCM in SMEs as it represents the supply chain thought (back-to-back supply chain from suppliers all the way through to customers) and controls supply chain processes through KPIs. With distinct reporting and a steering committee in place SCM in SMEs can be achieved fairly easily and with little expenditure of time.

Overall, Chapter Six reflects on and summarizes the aspects for SCM implementation in SMEs with a main focus on how supply chain management expertise can be developed and embedded in SMEs. This leads to the conclusion of this thesis in the next chapter.

CHAPTER 7 CONCLUSION

This chapter will conclude this thesis. It will also elaborate on aspects such as new knowledge generated in this thesis, contribution to the existing body of knowledge, generalisability, limitations of the thesis and further research which could be done.

Although, from an academic point of view, SCM developed in an evolutionary way over the past 50 years, the implementation of SCM has to be decided and implemented deliberately in a company. SCM is fostered through the collaboration of departments within an organization, but also through the integration with external partners in the supply chain. Furthermore, it is argued that SCM, mainly, has been facilitated through IT. For the integration of IT often the reengineering of processes in a company is necessary. In the literature it is assumed that SCM, now, is well established in LEs. However, there are papers, which question this and find supply chain integration, particularly, in a poor state.

The literature agrees that SCM is not yet established in SMEs. SMEs rarely deploy strategy in general or for SCM. Integration with customers and suppliers is neglected and often SMEs find themselves in a power imbalance with larger customers or suppliers. IT, a prerequisite for SCM, is very basic or does not support SCM. The main reasons for not implementing SCM appear to be resource constraints in the form of human resources and funds. The lack of human resources increases workload for SME staff and management but also inflicts a shortage of knowledge and expertise in the area of SCM. Moreover, in many ways SMEs appear to be different than LEs. SMEs have their own peculiarities and ways of working which forms a particular culture in SMEs.

In the literature there are some case studies which report about SCM implementation in SMEs. After reviewing the status of SCM in SMEs and comparing the case studies to SCM practices in LEs no major differences between SCM in SMEs and LEs can be detected. Therefore, it is claimed that there is no major difference between SCM in LEs and SCM in SMEs. Nevertheless, especially due to resource scarcity of human resource, knowledge, time and financial funds, SMEs need to be more selective regarding the SCM practices they choose to implement in order not to overstretch the resources, but still achieve high impact.

There are several enablers in SMEs which support SCM implementation. SMEs operate regionally and generally have a low number of suppliers and customers. This indicates a fairly simple supply chain setting. Generally SMEs appear to be strong in relationship building due to a strong position of the head of a SME, but also due to the preference of

face-to-face and personal communication. SMEs tend to have good relationships with their customers. Due to their good relationship building attributes there is still room for supplier development. Overall the enablers signal a strong basis for SME integration with external partners.

Managers implementing SCM in SMEs also need to take the risks associated with SMEs into consideration. Since the head of a SME is the focal point in a company and involved in decision making in almost any department and area of the business, structures tend to be less formalized, which leads to blurred departmental walls and less distinct structures. Moreover, internal collaboration is weak. SCM solutions need to be balanced with the resource, time, financial and knowledge constraints in SMEs. Overall, integration with external partners might be endangered by larger customers or suppliers, which take advantage of a smaller company's weak position.

New knowledge presented in this thesis

The framework presented recommends having the basics for SCM in the form of IT, strategy and understanding of the culture of the SME in place, before SCM implementation can be undertaken. An understanding of the culture is important as SMEs are different from LEs and, therefore, their characteristics can differ significantly from LEs' characteristics. This aspect is especially important for project managers who have not worked with SMEs before. The understanding of the SME's culture enables project managers to develop a solution which is tailored to the SME. As SMEs lack resources to develop SCM it also is important to tailor solutions for them so that they can work on the most prevailing issues. This ensures that they are not overburdened with the additional task of SCM. Company strategy is an important source of information in order to understand what the company's plans are for the future. Strategy also helps to tailor the supply chain solution for a SME. IT is the heart of SCM and is an important prerequisite for the implementation of SCM. Once the basics are in place initiatives such as performance measurement, integration and processes have been identified for integration in SMEs. This should be supported by change and project management. Continuous learning ensures progress and needs to be fed back into the project and the SCM implementation project continuously.

The case study shows that the focal company did not foster the development of SCM evolution and departments worked independently from each other before the start of the project. Moreover, there was a notion that SCM has something to do with trucks and

warehousing. The concept of integration and collaboration was not known. The absence of distinct structures made the implementation of SCM difficult in the beginning.

From this case study further aspects which are important for SCM implementation in SMEs have been derived. In order to create an early understanding of SCM among management and staff, a simple definition of SCM and early knowledge transfer concerning the most important aspects of SCM is important. Participants in this particular research preferred a participatory style for the development of the solution for the company. Reports and a consultative style were not accepted. Herewith, enjoyment seemed to be an important factor. Throughout the project management and staff learned that their opinion and input was valued and this created a sense of responsibility. This responsibility later contributed to the fact that the SCM solution implemented was easily accepted by management and staff. They also took responsibility for implementation. Finally, cross-functional collaboration embedded in an SME helps to implement and sustain integration and serves as a basis for SCM implementation. In order to foster cross-functional collaboration in this particular research CI was chosen. Throughout the implementation a step-by-step approach ensured a moderate speed of implementation, which helped management and staff become used to the SCM solution. The implementation was also facilitated by gradually increasing top-management support.

In this particular research the SCM solution is a process model, which represents all important functions within the company, but also links the company with suppliers, customers and 3PLs. Performance measurement is given through KPIs for every function. Overall, the process model aims at achieving the perfect order for the customer. The process model helps the focal company to focus their SCM efforts and work on and develop the process definition in order to ensure service quality and customer satisfaction. A reporting structure, which ensures that the KPIs are measured and discussed regularly, supports the process model significantly. Responsibility for the KPIs is given to five different departments within the SME and they are discussed in a steering committee on a regular basis. The steering committee is a crucial factor for SCM, as the SME discusses supply chain related topics on a regular basis. It, therefore, ensures internal collaboration and supports the development of external integration with customers, suppliers and 3PLs.

Contribution to the existing body of knowledge

This thesis contributes to the existing body of literature in several ways. First of all, the case study confirms several aspects concerning SMEs as described in the literature

review (section 2.2 Supply chain management in small and medium-sized enterprises), for example, scarcity of time and resources, limited collaboration among departments, a linchpin role of the managing director and weak position among customers and suppliers. However this thesis builds on the enabling factors for supply chain management in SMEs (for example good at relationship building and good communication) and balances them with the risks for supply chain management in SMEs (for example blurred departmental walls, resource constraints and limited knowledge).

This thesis also contributes to existing knowledge through the sheer length of the study. The study is stretched over two years, which enabled it to capture a bigger picture concerning supply chain management implementation in SMEs. Furthermore, the development of the project could be studied. Accordingly, it reconfirms that an action learning approach suits SMEs. Moreover, it also shows that involvement in the development of the solution as well as the implementation is crucial for the success of the project. Herewith action research also plays a very important role for the researcher.

This thesis contributes to the existing literature as it provides a holistic framework for the implementation of SCM in SMEs. Previous frameworks mainly focus on best practices and what can be done or has been done in SMEs. They neglect aspects such as change and project management for the implementation of SCM in SMEs. The framework presented combines three aspects of SCM implementation as well as project development. It highlights that the prerequisites, the solution, as well as the implementation of a SCM project need to be balanced from the beginning of the project. If those three aspects are balanced then they contribute significantly to the success of the project. This thesis emphasises and shows that the solution should be tailor made for the needs of the business. This ensures acceptance as well as usability of the solution in the future. It also shows that a project should not stop once the solution has been created. From this study it becomes obvious that implementation is equally important as solution generation. Assistance with implementation is especially important for SMEs as they do not have the time and resource for implementation.

In general, this thesis highlights that change management is equally as important as other aspects of project development and implementation. The human factor should not be neglected. On the contrary, if it is neglected this can put the whole project in danger. This thesis shows that CI can be an efficient change management tool and it shows how successful CI implementation in SMEs can be done. CI was also an important tool to change the culture of the focal company from top down to a more collaborative

approach. This was an important prerequisite for the implementation of SCM in the company.

This thesis reconfirms that internal integration is a basis for external integration. Internal integration needs to be firm before external integration and collaboration with external partners can be efficient. This thesis contributes to the literature as it claims that in order to change a company from a functional to a cross-functional and collaborative way of working a cultural change needs to take place. This can also contribute to the literature for LEs as, here, the understanding is that integration and collaboration is something that can be delegated and almost forced on departments. Nevertheless, this study shows that the change from a functional approach to collaboration can be lengthy and a change of culture is necessary.

This thesis further contributes to the existing SME literature. The case study is a good example of how SCM implementation in a SME can be undertaken through an external body. In the literature it is recommended for SMEs to obtain the help of external bodies for the implementation of innovation or new ideas. Nevertheless, few examples are presented so far in literature. This study identifies that the role of the project manager is important for knowledge transfer, project management and change management. If possible the project manager should be an additional source for the SME, but independent from the SME, as this secures a thorough project development and implementation. An independent project manager is also able to question and challenge existing structures and ideas in a SME.

Generalisability

It is argued, that a similar model could be applied to other SMEs. One needs to make sure, that the model reflects the business environment, industry and culture of the particular company. Not too many processes should be chosen in order to keep the model simple and not to overburden management and staff with too many additional tasks. Furthermore, the KPIs need to be meaningful to the business and easily measurable otherwise the process model could fail as management might drop the KPI measurement as they do not have the time to do it. This also points at the importance of IT for the creation of KPIs and the process model. Efficient IT can definitely support a process model. If processes can be measured easily then their management becomes easier. Ideally processes, which appear to be inefficient, should be redesigned as part of the process model. As a result of the process model, SMEs overview their most important supply chain functions and pursue efficiency simultaneously.

Through the process model SCM can be embedded in SMEs. SMEs might lack the funds or might not see the necessity for a dedicated supply chain manager. However, with the process model they have a steering body in place, which can replace a supply chain manager. It is a prerequisite that they attach a reporting system to the process model, which is similar to the reporting system implemented in the focal company. This particular reporting system ensures that the KPIs are overviewed by management who are close to the processes on a regular basis and gives the responsibility for the monthly KPI creation to staff. Nevertheless, staff and management should be equally represented in the committee, where the KPIs and issues related to the KPIs should be discussed. If necessary actions should also be agreed in this committee. This ensures that responsibility for the overall supply chain is distributed among management. The committee approach also reflects the participatory element, which helps to reduce resistance to change and increases the degree of involvement of every department in SCM. The model also reflects the thought of SCM as the management of the flow of information and material through a company and beyond its boundaries. It might suit SMEs particularly well as their supply chains often imply a lower number of suppliers and customers. Therefore, they do not need a dedicated supply chain function necessarily. At the same time once the model is implemented it should not take up too much time of the management, which is a scarcity in SMEs.

The role of a project manager is seen as crucial for the advancement of the project. The project manager can pursue the project on a regular basis and ensure continuity. This particularly benefits SMEs as time is scarce and management usually has to pursue several issues concurrently. Through a dedicated project manager drive, motivation and momentum are not lost. This facilitates the evolving character of the project, but also ensures that a solution is found and implemented. Ideally the project manager should be knowledgeable in SCM and be able to transfer basic knowledge and understanding to management and staff within the SME. The project manager should also reflect on the development of the project and the knowledge and insights gained and feed this back into the project to continuously develop and improve it. The above findings are largely generalizable for SMEs. The framework (Figure 33) for examples is applicable for any SMEs. However, different SMEs have different starting points and facing different competitive environments. Therefore a process model and a steering committee might not work for every company. In this particular case this approach worked well as the focal company's internal communication was good and the company culture was based

on collaboration by and large. However other SMEs might have to choose other best practices which suit them.

Limitations of this thesis

There are limitations within the research which will be discussed now. The findings of this research are based on a single case study. Therefore, the findings might not be applicable for other firms. Nevertheless, through the thorough literature review a broad overview over the current status of SCM in SMEs has been assured. Therefore, it can be assumed that the findings can be transferred to other SMEs.

Another limitation is that the papers about SMEs are often based on research in LEs. Often researchers do not differentiate between SMEs and LEs. It is claimed in this research that there is no major difference between SCM in SMEs and LEs. However, a clear differentiation in research between SMEs and LEs would contribute to clarity.

A further limitation is the researcher's limited experience in action research. The researcher had no experience in action research when the project started. As a result, initially, the researcher felt insecure about action research. However, it is claimed that she gained much more experience and confidence over the two year period of the project. Therefore, the quality of the thesis should not be affected by the researcher's experience level. Also, a very thorough and diligent approach secured the quality of the thesis.

Further research

Further research could test the framework suggested in this thesis with other SMEs. It would be especially beneficial to observe whether process improvement, integration and performance measurement could achieve an equally high impact for other companies compared to the focal company. Further research could also test the relationship between involvement of the focal company (participatory implementation) and the success of SCM implementation, as this would give further insight in change management and its importance for SCM implementation. Moreover, further research could also test weather CI is an equally strong tool for change management in other SMEs as in the focal company. This would be helpful in order to judge whether CI only worked well as it suited the focal company's culture or whether CI is a good change management tool in general.

The story of the battle of Salamis 480 BCE did not end with the defeat of the Greeks by the Persians. The Greeks did not give up even though they were defeated. The general Themistocles persuaded the navy to fight the Persians a second time. They manoeuvred the Persian fleet in a sea gate. There they had an advantage with their smaller but more agile ships against the Persian's ships. They defeated the Persians once and for all. This marks the rising of Greece and further development of ancient Greece. So, what do we learn from this for the battle of SMEs against LEs? SMEs should be aware of their strengths and make use of their SCM advantages such as strengths in relationship building and communication and should focus on these. SCM should play a significant role in process improvement and internal integration. If SMEs are integrated and can support their products and services through strong internal processes, then they can achieve high SCM standards and probably outperform LEs which are still struggling with SCM implementation and integration.

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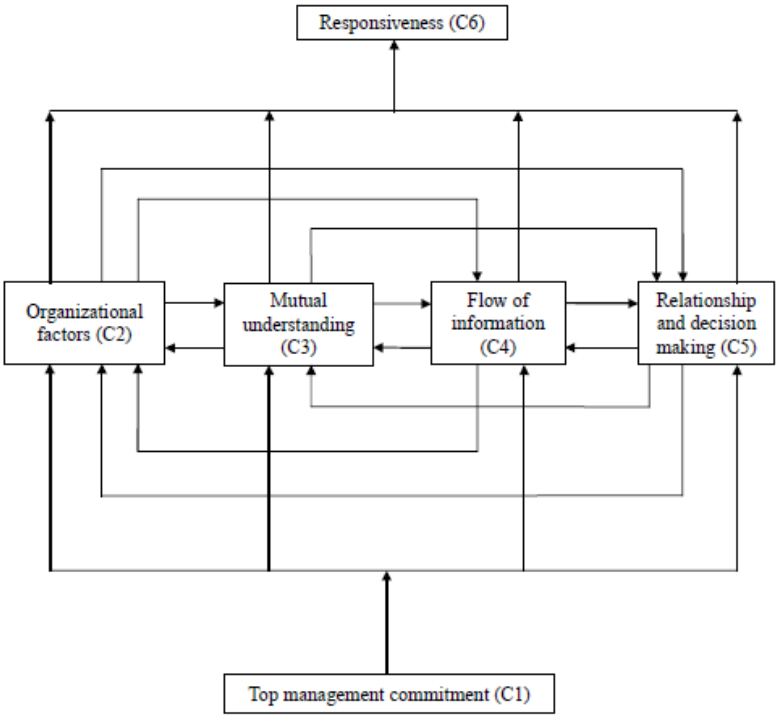
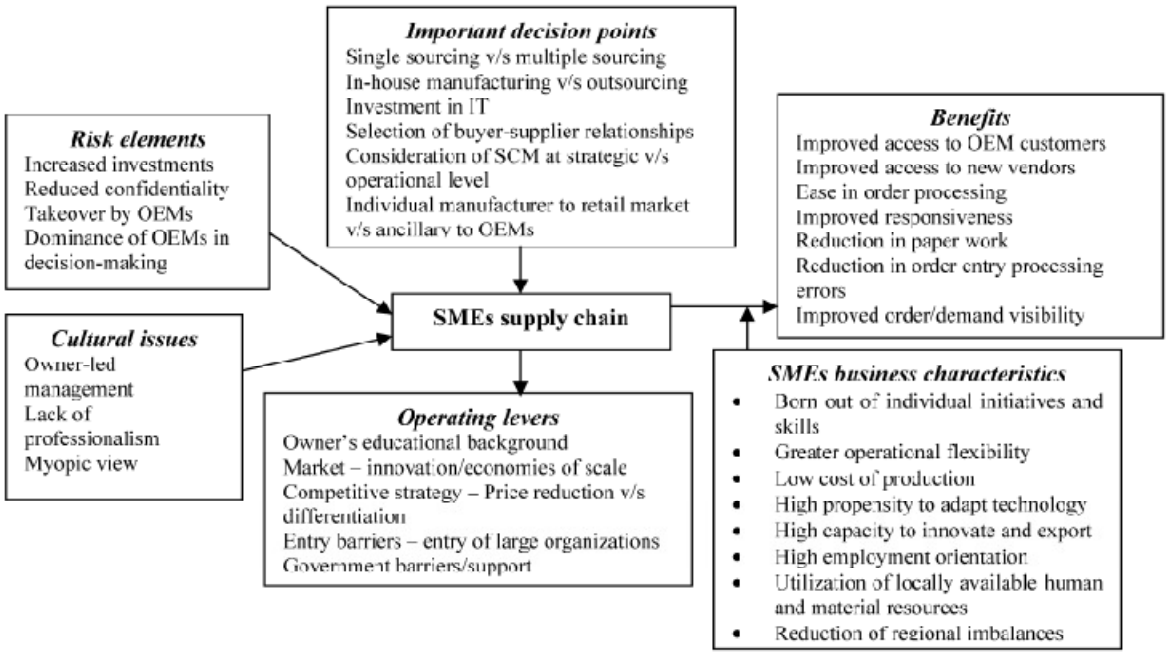
APPENDICES

Appendix 1



Interpretive structural modelling based model for enablers of coordination and responsiveness in supply chain (Singh, 2011, p. 630)

Appendix 2

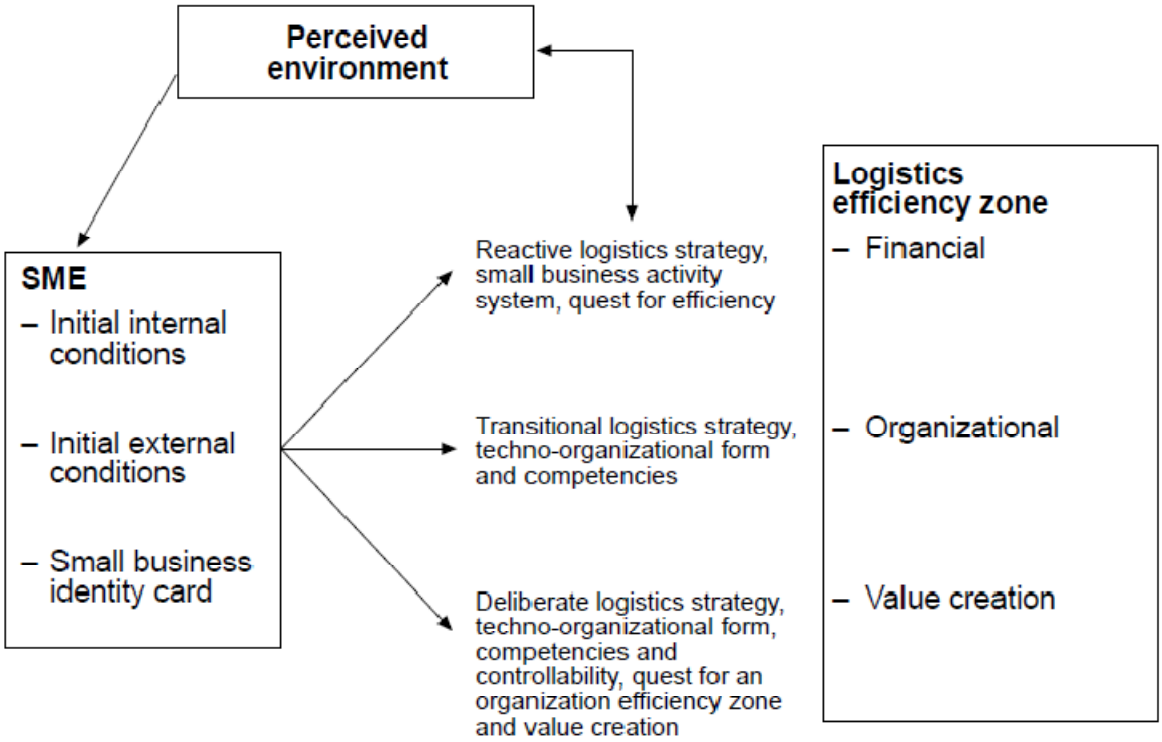


Issues in supply chain in SMEs (Thakkar et al., 2008b, p. 123)

Appendix 3

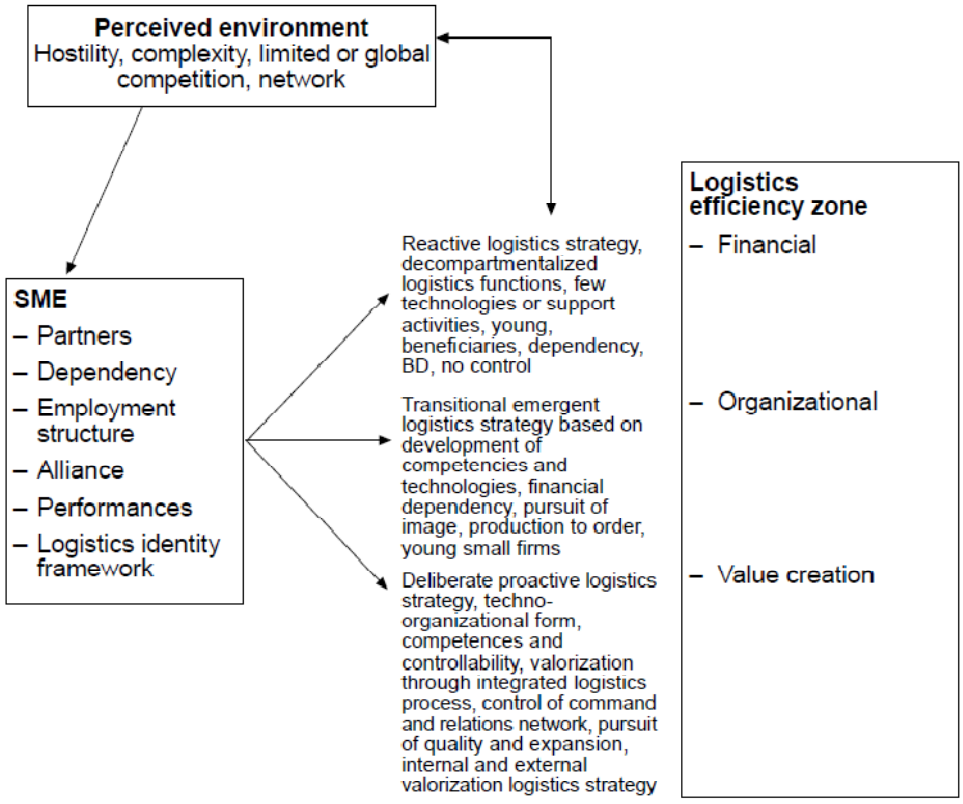
A composite model of enterprise planning and supply chain management for SMEs (Towers and Burnes, 2008, p. 353)

Appendix 4



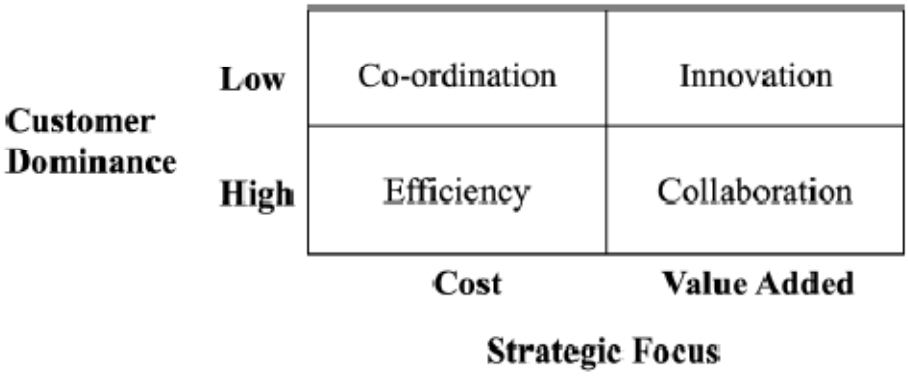
Strategic logistics model (Halley and Guilhon, 1997, p. 483)

Appendix 5



Three logistics strategies for SMEs (Halley and Guilhon, 1997, p. 490)

Appendix 6



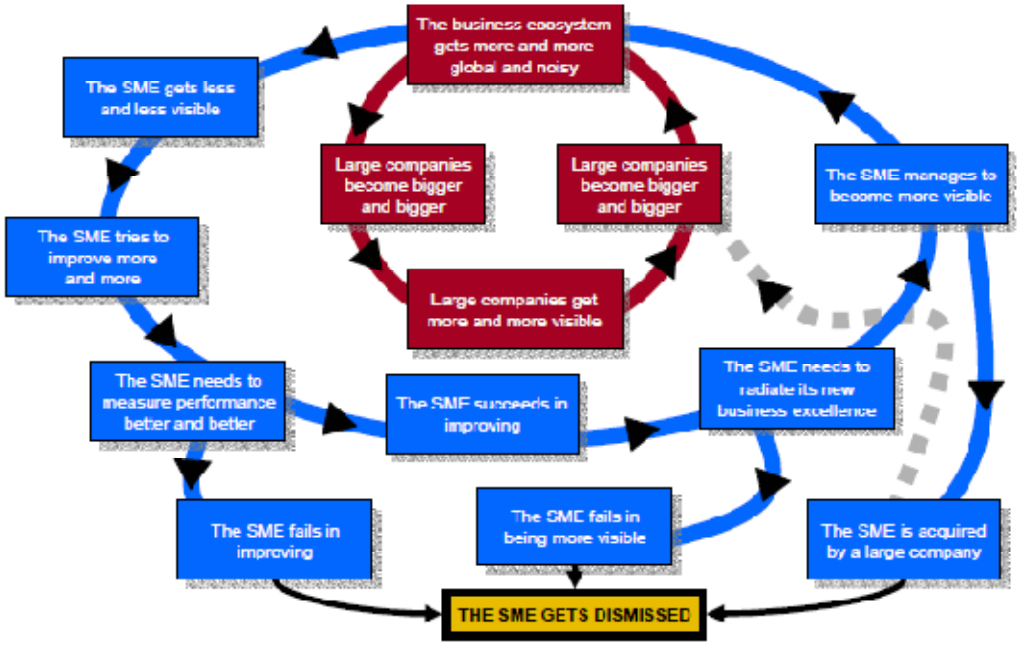
Competitive scenarios for SMEs (Quayle, 2003, p. 84)

Appendix 7

Function	Activities	Strategies/techniques	Technologies
Strategic planning	Corporate/business strategy development, resource management, budgeting, product/service selection, market segment analysis	Forming strategic alliances, outsourcing, forecasting demand, aggregate planning, selecting partners, selecting criteria for partnership, gaining the support of top management, improving continuously, getting government support	Groupware, shared information systems such as WWW, the Internet and EDI, ERP
Inventory management	Forecasting, location analysis, network consulting, slotting/layout design, order management	Demand-pull system, just-in-time, Kanban, material requirements planning, supply chain management, demand management	MRPII, EDI, ERP, WWW, online purchasing
Transportation planning	Shipping, forwarding, de(consolidation), contract delivery, freight bill payment, load tendering and brokering	Outsourcing, forming strategic alliances, optimizing routing and scheduling, managing capacity, total productive maintenance	Groupware, Internet, e-mail, WWW, Intranet, extranet, linear programming
Capacity planning	Capacity of transportation vehicles, warehouse capacity, human resources, material handling equipment	Make or buy decisions, planning aggregate capacity, minimizing costs, maximizing capacity	Linear programming, waiting line models, scheduling optimization, MRPII, CRP, ERP
Information management	Performance measures and metrics, data collection, processing, reporting	Groupware, IT/IS, shareware, data mining, data warehousing, intranet, extranet	EDI, e-commerce, Internet, WWW, AI and expert systems, ERP

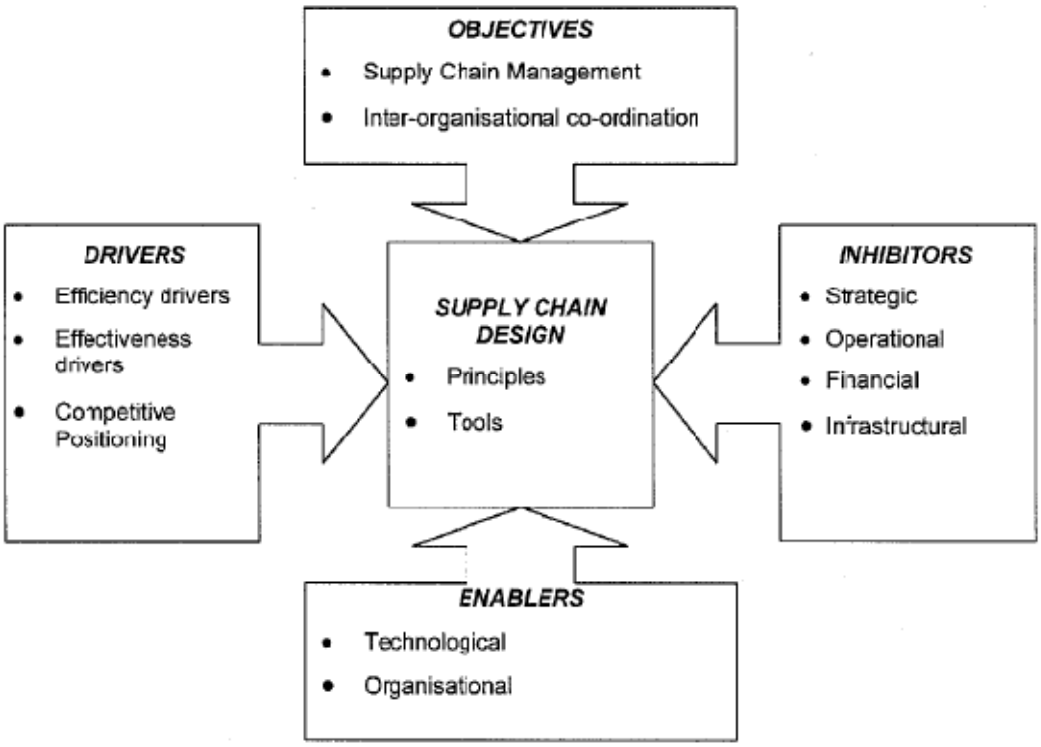
A framework for transforming a small- and medium-sized logistics company into a comprehensive 3PL company (Gunasekaran and Ngai, 2003, p. 838)

Appendix 8



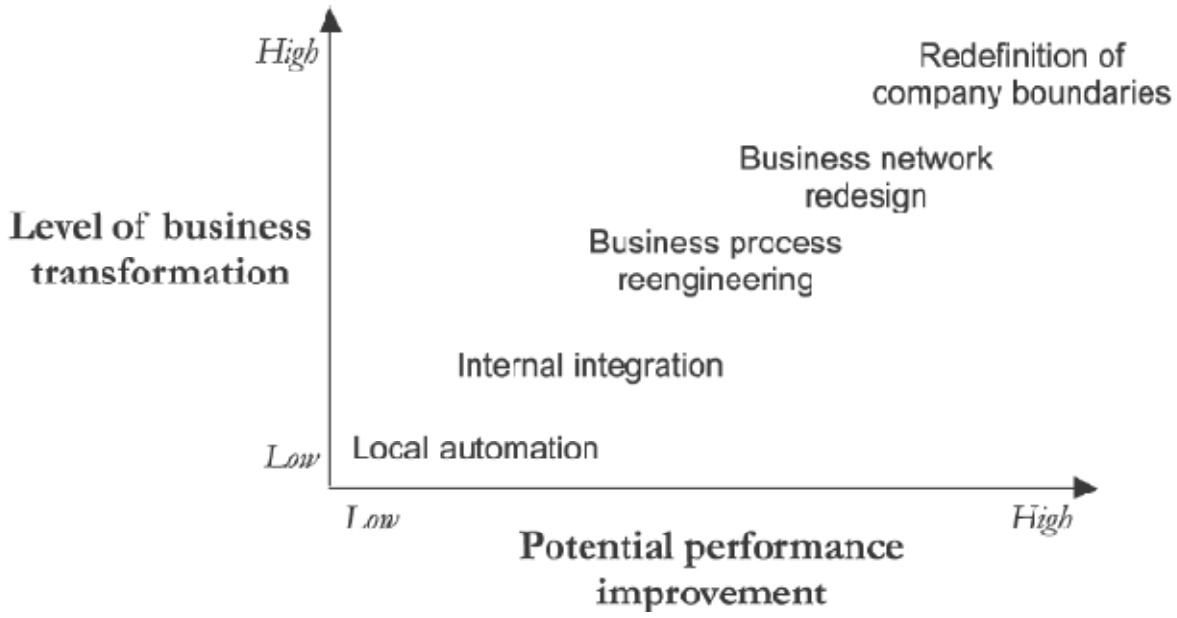
The business visibility vicious cycle (Alba et al., 2005, p. 2)

Appendix 9



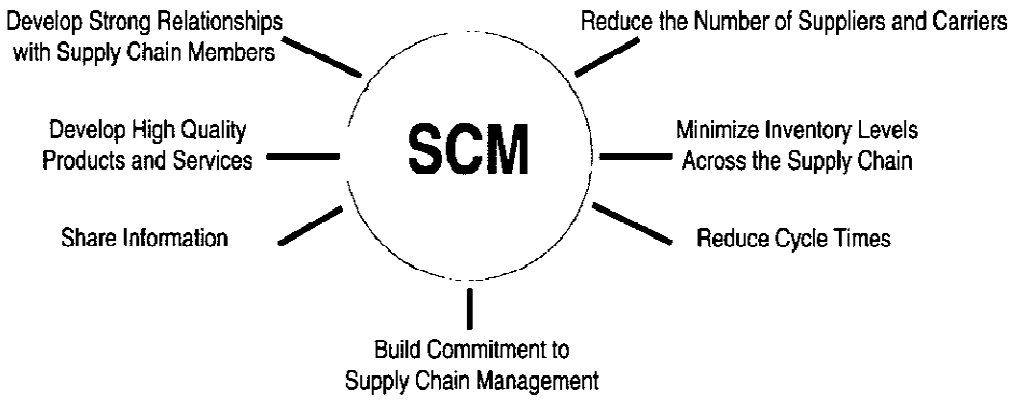
An adoption model of inter-organizational systems (Morrell and Ezingeard, 2002, p. 47)

Appendix 10



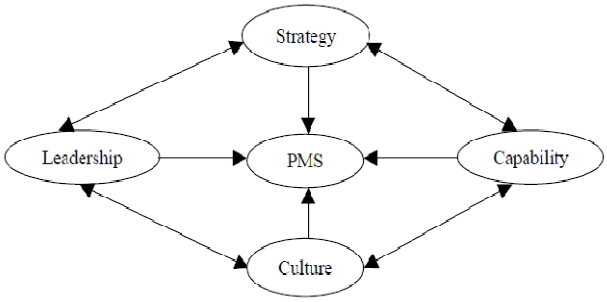
Levels of business transformation related to technological innovation (Buonanno et al., 2005, p. 390).

Appendix 11



Techniques Used to Implement Supply Chain Management (SCM) (Higginson and Alam, 1997, p. 20)

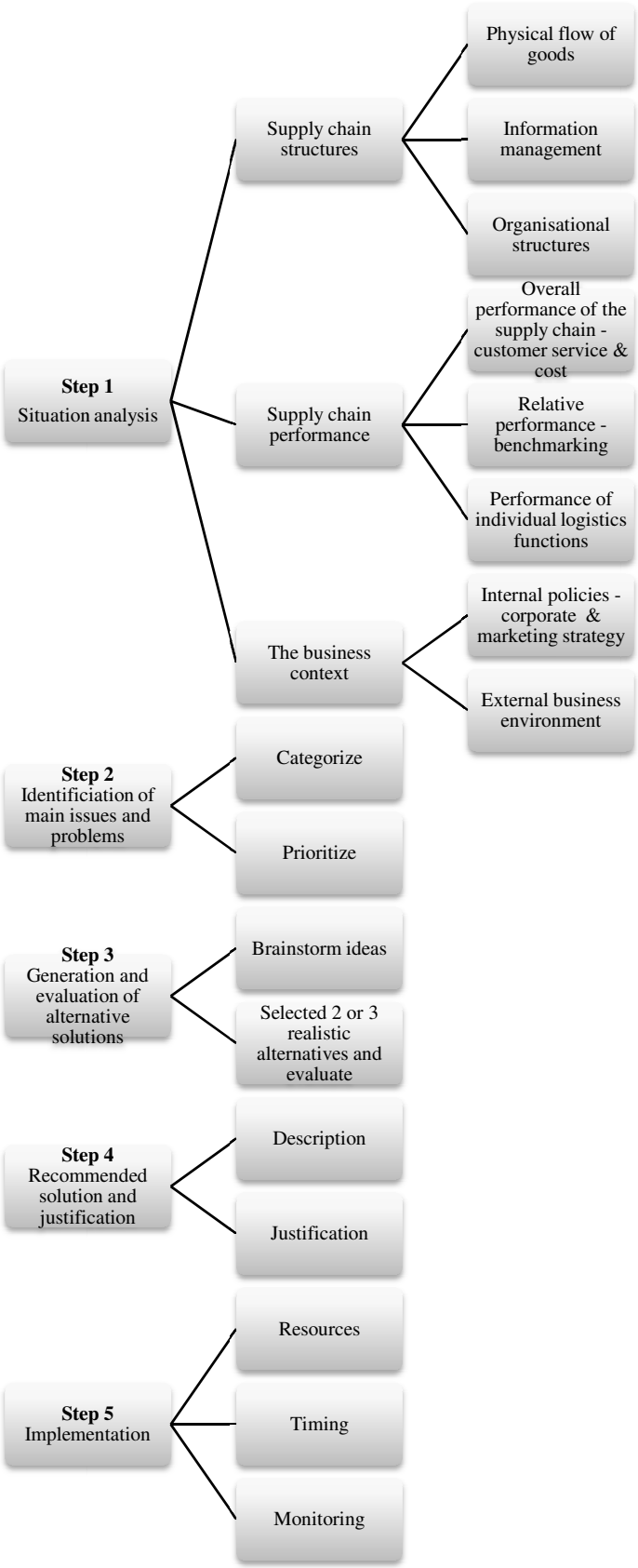
Appendix 12



Implementation Polygon (Thakkar et al., 2009b, p. 718)

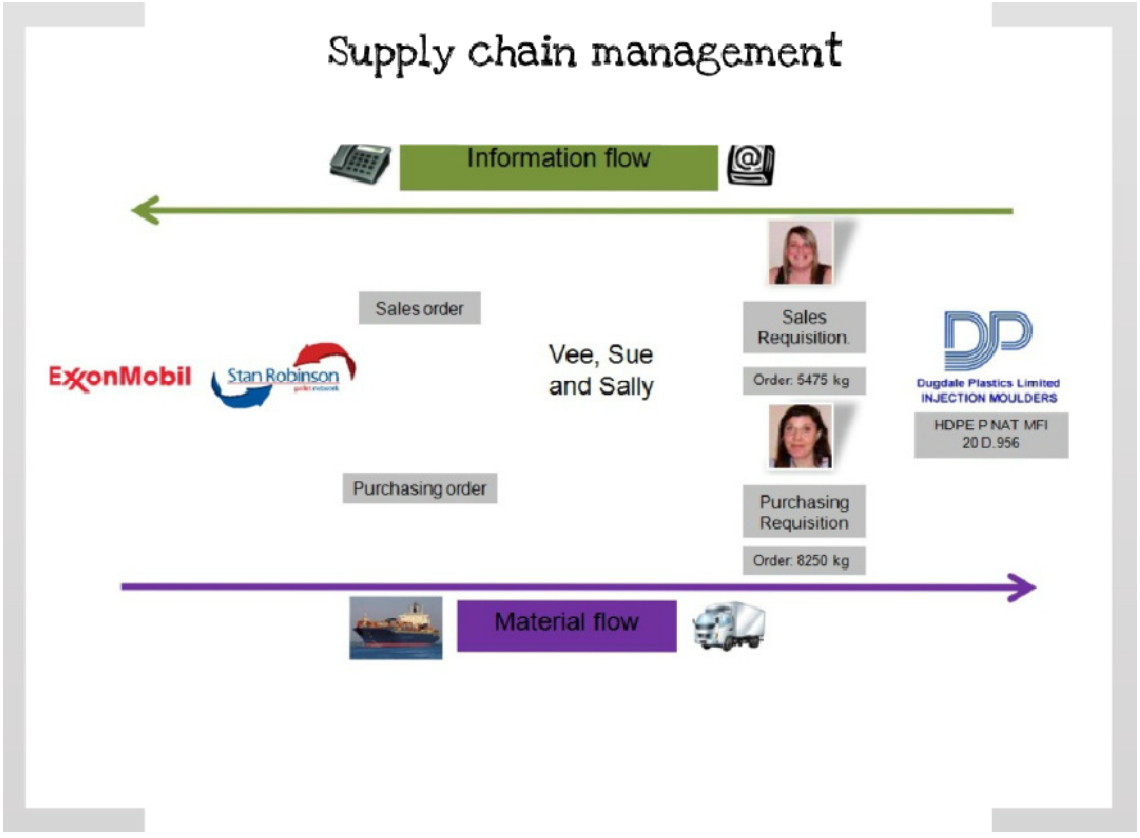
Appendix 13

Case analysis framework



Appendix 14


Supply chain management


Supply chain management
Information flow
Sales order
Vee, Sue
and Sally
Sales
Requisition
Order: 5475 kg
Dugdale Plastics Limited
INJECTION MOULDERS
HDPE P NAT MFI
20 D.956
Purchasing order
Purchasing
Requisition
Order: 8250 kg
Material flow

So what is it ultimately?

It is claimed...

- That SCM is common practice among large enterprises, but SMEs lag behind...
- The second statement is proven by research...
- But the first statement is doubted by some researchers, too...

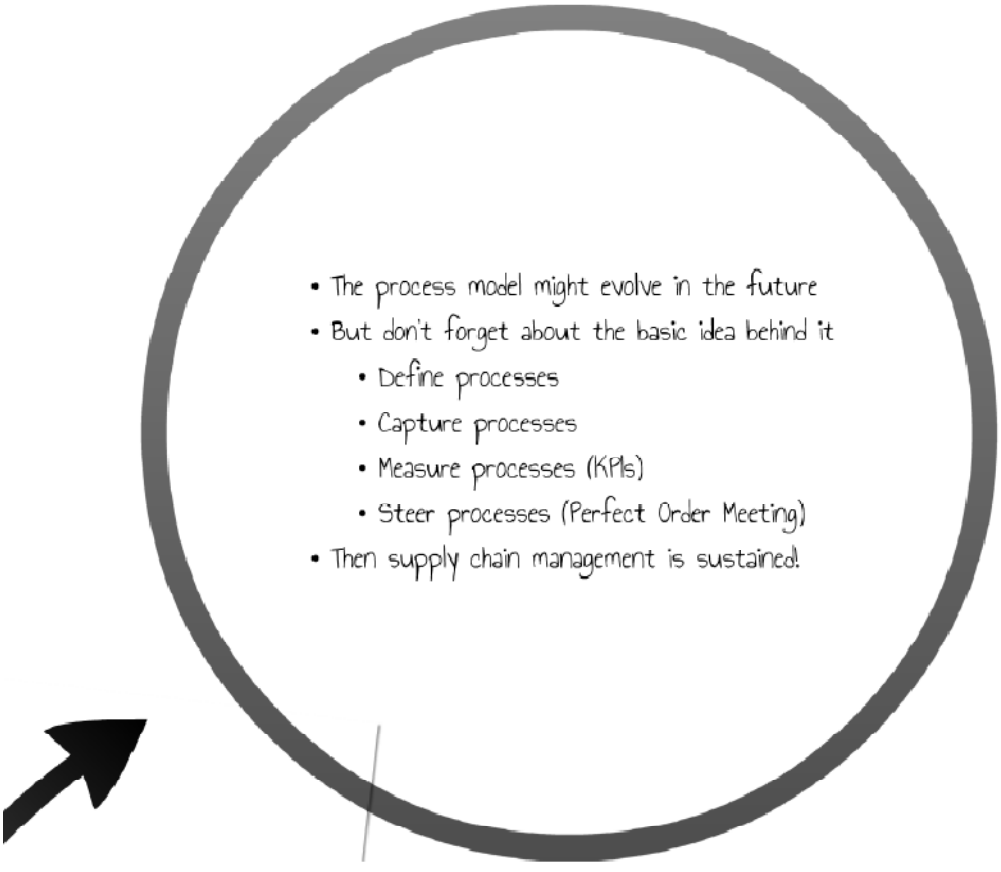
Against all odds!

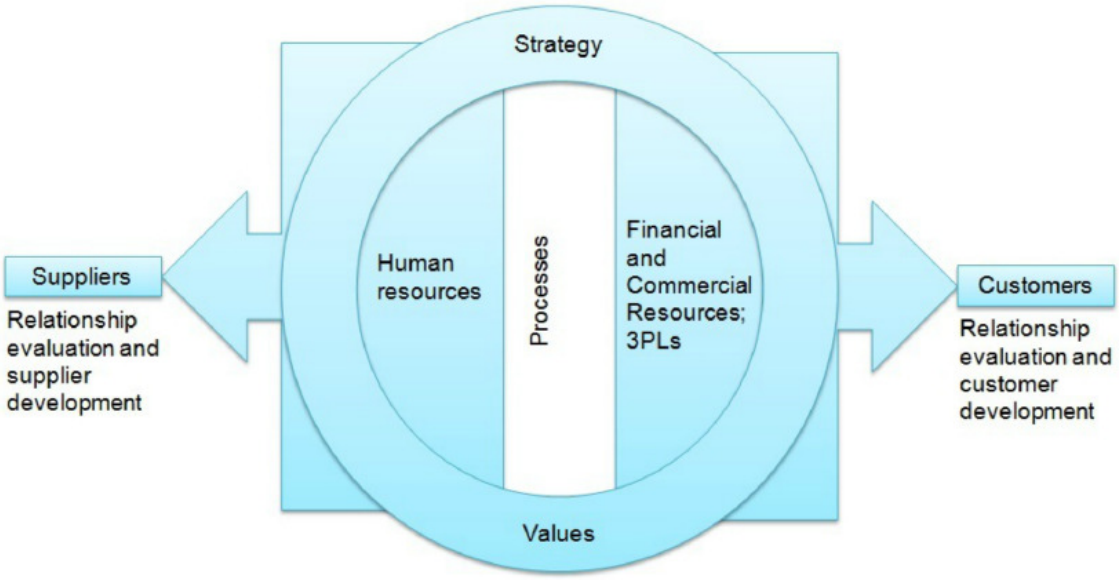
You do do SCM

And you have two powerful tools to sustain it

- Continuous improvement
  - As a basis for supply chain management
- New Process Model
  - Covers your whole supply chain (purchasing, stock management, sales and finance)
  - To depict processes
  - To re-engineer processes
  - To measure processes
  - To steer processes
  - Collaboratively
  - Isn't that supply chain management?
  - Doesn't that provide a powerful tool for business growth and future business models?


So...
• You have the model
• AND the people behind it
• It's not just the Process Champions and the Reporting Owners but everyone in Plastribution
• Continuous improvement
• PIEs
• Regular Perfect Order meetings sustain supply chain management AND the perfect order for the customer


• The process model might evolve in the future
• But don't forget about the basic idea behind it
• Define processes
• Capture processes
• Measure processes (KPIs)
• Steer processes (Perfect Order Meeting)
• Then supply chain management is sustained!


Strategy
Human resources
Processes
Financial and Commercial Resources; 3PLs
Values
Suppliers
Relationship evaluation and supplier development
Customers
Relationship evaluation and customer development