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The Motives for B2B Integration: *An Empirical Study*

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Abstract

With the ongoing process of building business networks in today's economy, business-to-business integration (B2B Integration) has become a strategic tool for utilizing and optimizing information exchange between business partners. Industry and academia have made remarkable progress in implementing and conceptualizing different kinds of electronic inter-company relationships in the last years. Nevertheless, academic findings generally focus exclusively on certain aspects of the research object, e.g. document standards, process integration or other descriptive criteria. Without a common framework these results stay unrelated and their mutual impact on each other remains largely unexplained. In this paper we explore motivational factors of B2B integration in practice. In a research project using a uniform taxonomy (eXperience methodology) we classified real-world B2B integration projects from a pool of over 400 case studies using a pre-developed framework for integration scenarios. The result of our partly exploratory research shows the influence of the role of a company in the supply chain and its motive to invest in a B2B solution.

Keywords: B2B Integration, E-Business, Business Collaboration, Content Analysis, Motivation

1 Introduction and Literature Review

Since the 1960's when the first approaches to B2B integration appeared researchers have struggled to find a common term for inter-organisational systems. The most common terms in use are:

- Inter-Organisational Systems (IOS) (Barrett and Konsynski 1982; Cash and Konsynski 1985; Klein 1993, Alt 1997)
- Electronic Business Networking (Alt and Fleisch 2001)
- Business Collaboration (Wölflé 2007)

- Collaborative Business (Silberberger 2003)

Although there is still no single agreed upon term for integration, electronic data interchange has long been in active use bridging company boundaries between different companies in different industry sectors. EDIFACT as one of the first world-wide valid standards provided a practical solution on the technical integration level (Kalakota and Whinston 1996) whereas research began to investigate systematic classifications of integration scenarios (Keen 1991) and process integration (Schumann 1990). With the commercial dispersion of the Internet, a new aspect of inter-organisational integration emerged, namely E-Business (Schubert et al. 2004), that brought together the technical and organisational levels in a holistic approach.

1.1 B2B Integration Research

The effects of completed B2B projects on involved partners are subject of several researchers (Lim and Wen 2002, Kim et al. 2003, Chwelos et al. 2001) as are the efforts to determine the distinct pre-conditions on which basis these projects are conducted (Robey et. al 2008). There are different theoretical or experience-based assumptions on motives for B2B integration (Bussler 1998, Iacovou et al. 1995). Nevertheless, there is hardly any industry independent empirical research that identifies the needs of integration adopters on a broad scale.

The majority of literature contributions focus on the implementation and conceptualization of electronic intercompany relationships (e.g. Bauer and Stickel 1998, Grant and Tu 2005, Schubert and Wölfle 2003, Österle et al. 2002, Wölfle 2007).

Current research still seeks to combine the relevant *integration levels* into one holistic classification scheme. Most approaches focus on one or at most two levels of integration (cf. Technical Integration: Massetti and Zmud 1996, Schissler et al. 2002; Bussler et al. 2002; Voigtmann and Zeller 2003; Organisational Integration: Buxmann 1996; Alt and Fleisch 2001; Mertens 2004; McAfee 2006; Barrett and Konsynski 1982, Kumar and Van Dissel 1996; Institutional Integration: Chatterjee et al. 2006). Finding interdependencies between different aspects proves to be difficult without a common research framework and a common empirical database to test the findings.

1.2 eXperience Methodology

The eXperience Methodology (Schubert and Wölfle 2007) has been specifically designed for the collection and the transfer of best practice experiences in enterprise systems projects. The methodology provides a toolset containing templates for (1) the writing of case studies, (2) the effective classification and storage in an online database (Web platform), and (3) ways of organising workshops and events where first-hand experience is being presented (knowledge transfer and teaching). A common classification scheme is used for all cases to record the project experiences which make them an ideal source for a structured cross-case analysis.

1.3 Current State of Research on B2B Integration (eXperience)

eXperience case studies follow a view-based approach which makes the different levels of the business solution visible and reflects management-oriented, organisational and technical aspects. This multi-perspective approach has investigated various topics ranging from “E-Procurement in E-Business” to “Process Excellence with Business Software”. Overall ten theme-related books have been published since the year 2000; four of them focus on B2B Integration exclusively (Schubert et al. 2002, 2003 and 2004; Wölfle and Schubert 2007).

Classification Scheme for B2B Integration Scenarios

Based on the eXperience data and the underlying eXperience methodology we developed a multi-perspective classification scheme for B2B integration projects. The scheme combines criteria from multiple viewpoints (technical, organisational, institutional). We completed a comprehensive analysis of 109 case studies. During this process we refined our classification scheme according to relevance and completeness of the selected criteria. Starting with 36 criteria from different subject areas we increased our set to 43 criteria at the end of our investigation. We aligned the findings according to the five subject areas which we defined during our evaluation process. These are *Company Background*, *Technical Integration*, *Value Chain Integration*, *Organisational Integration* and *Project Management*. Due to the page limit we were forced to select a subset of the complete findings for this paper. In the following sections we limit our discussion to the identification of the *motives for investment* (subject area *Project Management*) into B2B integration projects dependent on the role of the company in the *supply chain* (subject area *Company Background*) because we believe that these are the most interesting topics for the Bled conference audience.

Criteria in the Classification Scheme

Each case study company is classified according to its industry sector and its position in the supply chain (Chopra and Meindl 2001). We applied two criteria for the classification of the cases: (1) the company's position in the *value chain* and (2) *investment motives*.

Criterion 1 (position in the value chain):

The position in the supply chain can be differentiated according to the company's role within the value chain:

1. *Suppliers*: Providing raw materials for products
2. *Manufacturers*: Converting raw materials to consumable products
3. *Distributors*: Allocating products to retailers
4. *Retailers (Wholesale and Retail)*: Selling products to customers
5. *Service Providers*: Offering service products
6. *Customers*: Consuming products

Criterion 2 (investment motives):

Criterion 2 investigates the characteristics of the organisational integration, namely the motives for the investment in the integration project. The motives described in each of the cases were first individually identified, put in a table and then grouped by the following seven motives:

1. *Optimization of processes (time)*: Time-effective reorganization of processes (labour hours)
2. *Optimization of processes (costs)*: Reducing process-related costs in regard to process-performance and process maintenance
3. *Optimization of processes (transparency)*: Reorganization of business processes for improved controlling and performance purposes
4. *Integration of partners*: Enhancement of collaborative activities to incorporate business partners into own business processes

5. *Information sharing*: Improvement of a common information basis
6. *Creating new distribution channels*: Implementation of underdeveloped market opportunities
7. *Improvement of customer loyalty*: Creation of a bond with valuable customers

Our study seeks to answer the following research question:

Is there a relationship between the position in the supply chain of a company and its motivational factors for an integration project?

2 Research Methodology

In the following sections we describe our research approach, data sources used and the details of our research steps.

2.1 Research Method

As a first step, we use an exploratory approach to develop the classification framework. A longitudinal research project underway since 1999 in a partner network among Swiss and German Universities (the eXperience initiative, Schubert and Wölflé 2007), has developed more than 400 case studies of real-world IS implementations. The majority of these cases deal with enterprise systems implementations. Drawing on this extensive source of detailed data we performed a comprehensive and in-depth content analysis applying techniques described by Miles and Huberman (1994) and Gläser and Laudel (2004). Case studies are particularly suitable for understanding phenomena within their organisational context (Yin 2003). Klein and Myers (1999) concluded that “case study research is now accepted as a valid research strategy within the IS research community”. Bonoma (1985) points out that case studies in social sciences have been used for both (1) validating existing theories and thus deducing empirical consequences and (2) building theory by using inductive principles. Our approach falls into the second category as we use case studies to derive interdependencies between criteria of a classification framework for B2B-Integration projects.

2.2 Data Source: eXperience Database of IS Case Studies

The approach adopted to case studies in the eXperience initiative produces an in-depth description of an existing enterprise system solution and associated practices within an organisation. It encompasses

- a description of the organisations and actors and the regulatory setting;
- the business scenario, partners, and company strategy;
- the objectives, expectations, and desired benefits of the software project;
- the actual outcome of the implementation (enterprise system solution);
- the advantages achieved and the shortcomings observed (learnings).

The eXperience case study database is the largest case study platform in the German speaking area. As of February 2009, there are 373 case studies in German, 64 in English, and 13 in French available online (www.experience-online.eu). Before being published, all case studies go through a rigorous data validation and editorial process to ensure veracity and quality. With the help of a common template and the use of a uniform terminology, the editorial team ensures that the case studies are comparable and can be cross-analyzed. As a result, the eXperience database provides an increasingly

large, empirically derived dataset for case study research which can be accessed free of charge by the community of IS researchers.

2.3 Research Steps

We use a qualitative content analysis for our investigation. In order to answer our research question, we followed the method of Gläser und Laudel (cf. Figure 1) which suggests a common structure for research processes in empirical social-economic environments (Gläser and Laudel 2004).

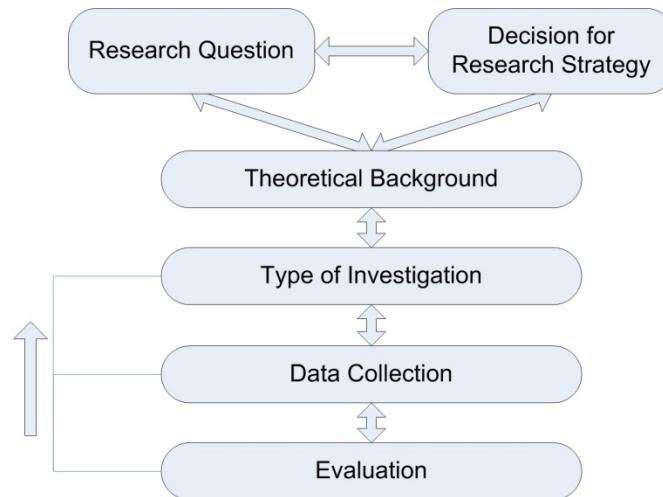


Figure 1: Research Steps according to Gläser and Laudel (2004)

Three consecutive stages of investigation provided a step-by-step procedure for the development of the classification scheme.

(1) First a set of case studies was chosen from the specialised book on Business Collaboration (5 case studies). These studies deal with the focus topic explicitly and were used for a preliminary *exploratory analysis*. We applied the resulting first version of the classification scheme to every case study of the set and eliminated redundant criteria or added new descriptive criteria to the scheme. We repeated this procedure with five case studies from a different book in order to test its applicability.

(2) The exploratory analysis resulted in a series of *criteria* which were grouped into five subject areas.

1. *Company background:* General description of the company (e.g. turnover, industry sector, employees)
2. *Technical Integration:* Tools for integration (e.g. document standards, diversity (Massetti and Zmud 1996), process standards)
3. *Internal Value Chain Integration:* General infrastructure of integration scenarios (e.g. primary and secondary processes (Porter 2000))
4. *Organisational Integration:* Characteristic properties of business management aspects (e.g. economic effects, enterprise benefit)
5. *Project Management:* Aspects describing the circumstances of an integration project (e.g. installation costs, reason for investment)

(3) Within these areas we discarded criteria that could not be used for a later evaluation. The result was a *structured and tested classification scheme* for the following data collection process.

Data Collection and Evaluation

The classification scheme was applied to a further eight case studies in order to refine the criteria and their values. After this step the scheme was applied to all case studies in the eXperience database (all 450 not only the ones describing integration projects).

The cases were summarised and evaluated based on the Conceptually Ordered Display approach by Miles and Huberman (1994). We condensed the answers in a cross-case analysis. The result of these steps are used for the following discussion of the findings.

3 B2B Integration Classification

The following section presents selected patterns which emerged from the classification scheme.

3.1 Patterns Emerging from the Classification Scheme

Overall, there are 450 eXperience case studies available that describe topic-related business software solutions. 126 cases describe integration scenarios from which 109 are valid for our evaluation process. This means there are no undetermined criteria allocated to an integration scenario (e.g. “industry sector of integration partner”, “integration scenario” etc.). We dismissed 17 cases from our sample due to missing or incomplete data.

The relationship between the case-study company and its partner is always seen as a pairwise couple. This means that for every connected partner we count its integration as an independent couple. Therefore a case study can contain more than one integration scenario. Candulor is for example described as a *distributor* as well as *customer* in one single case study.

3.2 Company Background

Criterion	Case	Industry Sector*	Relationship	Main Role*	Partner	Partner Role*
Value	Cegelec	C MANUFACTURING	B2B	Manufacturer	Carlson Wagonlit Travel	Service Provider
	WyserAG	G WHOLESALE AND RETAIL	B2B	Wholesale	Retail, Customer	Retail, Customer
	ottomobil.de	G WHOLESALE AND RETAIL	B2C	Wholesale	Customer	Customer
*The Coloured Criterion is used in the forthcoming evaluation						

Table 1: Example of the applied classification scheme with filled criteria

In 96 cases studies, only one partner-organisation was found, whereas in the other 13 cases the case-study company had two partner relationships. We classified the enterprises according to our above described criteria (cf. table 1).

In accordance with the method described in Chopra and Meindl (2001), we assigned the appropriate supply chain role to each enterprise within each case study. The assignment of the role is dependent on the partners' roles with respect to the corresponding business scenario and the enterprise's primary business processes (Porter 2000) that define its core business functions.

There are 33 companies in the manufacturing-role and 11 distributors. Other represented roles are *retailers* (Wholesale) (29 companies), *retailers* (Retail) (9 companies) and *service providers* (21 companies). The remaining 6 case studies represent both the supplier and customer role. We did not include the latter in the paper as the number of case studies was too small for a meaningful evaluation.

3.3 Investment Motives

The criterion *motive for investment* from the subject area *project management* is subject to multiple answers concerning the overall seven identified motivational *factors* for B2B integration projects (cf. Figure 2). That means, a company can state at least one or more motivational factors for its integration project.

Motive for Investment

Looking at the *motives for investment* we found that 68 companies name cost-related process optimization as main motivation for their B2B integration project (cf. Figure 2). This means that almost three quarters of the organisations in the sample see their main benefit of a B2B integration project in a *process-related cost improvement*. This reason is closely connected with the promise of a *time saving benefit* (59 enterprises). Thus, time (labour hours) and cost dominate strategic decisions for setting up a closer partner relationship (56 enterprises name both factors).

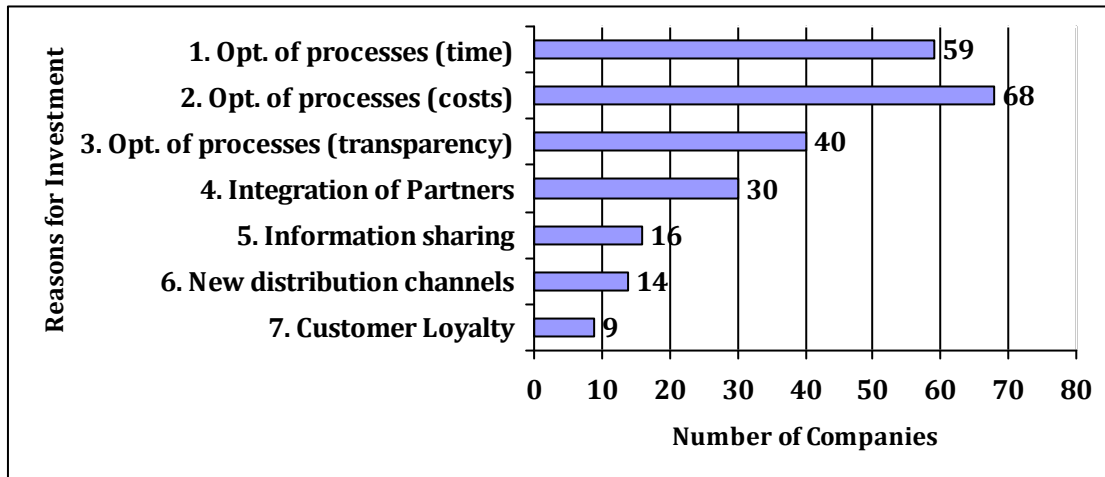


Figure 2: Investment motives identified in the case studies

40 companies seek an opportunity to enhance their *control and performance* of processes by creating transparent and traceable activities within business partners. Interestingly, the mere integration with a partner is only a motivational factor for 30 companies. Furthermore, more strategic goals like *information sharing* (16), the creation of *new distribution channels* (14) or the *improvement of customer loyalty* (9) have a significance to a smaller number of companies.

3.4 Supply Chain Integration Motives

With the dispersion of the industry sectors in mind we focused on *supply chain integration motives*. Different motivational factors were analyzed in regard to their overall occurrence and their dependence of the position of the partners in the supply chain.

Motives for Investment and Main Role

Using the main roles introduced in Chapter 1.3.2 we investigated the *reasons for investment* in relation to the specific role of an enterprise within the supply chain (cf. Table 2 and Table 3). We found that there are role-specific divergences from the total numbers presented in Figure 2. Especially *distributors, retail companies and service providers* show a divergence of greater-equal five percent in relation to the identified reasons for investment.

This uneven relation between role and reason for investment might have the following reasons: *Distributors* do not see the need for the creation of new distribution channels. They rather invest into deepening their partner collaboration (+7%) and making these processes more transparent for their daily business (+6%). Information and communication seems to be of much higher value when it comes to coordinating a great amount of products with several different partners.

Reason for Investment	Total	Percent	Manufacturer (Total)	Percent	Difference	Distributor (Total)	Percent	Difference
1. Optimization of processes (time)	59	25 %	22	25%	0%	5	19%	-6%
2. Optimization of processes (costs)	68	29%	24	28%	-1%	7	27%	-2%
3. Optimization of processes (transparency)	40	17%	13	15%	-2%	6	23%	+6%
4. Integration of partners	30	12%	13	15%	+3%	5	19%	+7%
5. Information sharing	16	7%	6	7%	0%	2	8%	+1%
6. Creating new distribution channels	14	6%	5	6%	0%	0	0%	-6%
7. Improvement of customer loyalty	9	4%	3	3%	-1%	1	4%	0%
	236	100%	86	100%		26	100%	

Table 2: Patterns emerging from different supply chain roles (1/2)

Retail companies focus much more on the creation of a new distribution channel (+10%) whereas the integration with business partners seems to be less important (-7%). Especially the implementation of high performing web shops as sales channel to the customers was a main project trigger in the case studies.

Service providers tend to focus on process-related cost more than any other investigated role (+5%). As services represent an incorporeal product form, the value of a service completely depends on the activities that create and deliver the additional benefit. Therefore, the process itself is subject to improvement measures.

Reason for Investment	Total	Percent	Wholesale	Vertical (Percent)	Difference	Retail	Horizontal (Percent)	Difference	Service Provider	Diagonal (Percent)	Difference
1.	59	25 %	20	28%	+3%	4	21%	-4%	13	26%	+1%
2.	68	29%	21	30%	+1%	5	26%	-3%	17	34%	+5%
3.	40	17%	10	14%	-3%	4	21%	+4%	9	18%	+1%
4.	30	12%	6	9%	-3%	1	5%	-7%	5	10%	-2%
5.	16	7%	4	6%	-1%	1	5%	-2%	3	6%	-1%
6.	14	6%	6	9%	+3%	3	16%	+10%	2	4%	-2%
7.	9	4%	3	4%	0%	1	5%	-1%	1	2%	-2%
	236	100%	70	100%		19	100%		50	100%	

Table 3: Patterns emerging from different supply chain roles (2/2)

The *manufacturer* and *wholesalers* roles show little divergence. Manufacturers show a slightly enhanced interest in deepening the cooperation with partners. This motivation may result mainly from the urge to create common business processes that establish a uniform and purely electronic data exchange. Most integration projects with *manufacturers* focus on the exchange of order documents.

Wholesale companies on the other hand emphasize the optimization of time for their daily business processes. The cooperation with several partners from the retail sector seems to be more critical than the issue of greater control of process transparency.

4 Conclusions and Limitations

This paper presents an evaluation based on a B2B integration classification scheme that describes integration scenarios. The result of our explorative research revealed typical patterns and interdependencies between a company's role within the supply chain and motives for investment in B2B integration projects. We identified the following patterns in 109 case studies:

Main Role and Motives for Investment

- Distributors, retail companies and service providers have distinctive motivations for B2B integration projects.
- Distributors focus on partner integration and process transparency.
- Retail companies strive to optimise their distribution channels.
- Service providers see the need to improve their process-related cost.
- Manufactures and Wholesalers show only slight deviations from the overall results of the reasons for investment.

The project findings and the classification scheme provide insights into the relation between companies, their position in the supply chain and motivational factors for role-dependant integration initiatives. Such insights can guide companies in their integration activities and help them compare themselves with similar companies.

The eXperience database is (with over 400 cases) a vast resource of empirical data and can be used to study real-world phenomena. Nevertheless, it needs to be pointed out that the projects described therein are all success cases that are deliberately contributed by project managers. It might be possible to learn even more from failed projects.

In this paper, we offered some possible explanations for the observed data patterns. However, there might be different or additional reasons why companies invest in B2B solutions that cannot be taken from the descriptions in the case studies.

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