

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/235921088>

Benefits Identification in Inter-Organizational Information System Implementation Projects: A Multi-Case Study Approach

Conference Paper · January 2012

DOI: 10.1109/HICSS.2012.132

CITATIONS

2

READS

43

3 authors:



[Norbert Frick](#)

Universität Koblenz-Landau

16 PUBLICATIONS 16 CITATIONS

[SEE PROFILE](#)



[Kai Manuel Hemmerich](#)

Universität Koblenz-Landau

2 PUBLICATIONS 2 CITATIONS

[SEE PROFILE](#)



[Petra Schubert](#)

Universität Koblenz-Landau

178 PUBLICATIONS 1,617 CITATIONS

[SEE PROFILE](#)

Benefits Identification in Inter-Organizational Information System Implementation Projects: A Multi-Case Study Approach

Norbert Frick
University of Koblenz-Landau
norbert.frick@uni-koblenz.de

Kai Manuel Hemmerich
University of Koblenz-Landau
khemmerich@uni-koblenz.de

Petra Schubert
University of Koblenz-Landau
petra.schubert@uni-koblenz.de

Abstract

Businesses are increasingly engaging in inter-organizational collaboration. At the same time, assessing the benefits and the success of an inter-organizational system is still a challenge. Academia and businesses alike struggle with insufficient assessment methods and benefits measurement processes. Our research applies and extends a recently developed framework for the assessment of expected and realized benefits in IS implementation projects (expectations-benefits framework). The framework was developed using an established case study methodology (eXperience methodology) including more than 140 case studies of real-world IS projects.

In this paper we selected a sample of 16 suitable cases for the study of inter-organizational information systems and found 190 realized and 59 unexpected benefits in the described implementation projects. The findings show several patterns in the benefits in relation to the existing integration scenarios and the benefits categories.

1. Introduction

Enterprise applications are the second most significant IT priority according to a recent survey of 1500 CIOs in 30 industries and 48 countries [41]. Still, there is a significant uncertainty about the benefits contribution of IT investments to the organization [38]. Businesses are increasingly involved in various kinds of collaborative activity ranging from simple electronic document exchange (e.g. orders and invoices) to complex supply networks with interfaces to business partners on many different levels. Nevertheless, “[...] even as B2B projects are proliferating, for many companies, the status of their multi-enterprise integration projects is in the same condition as their internal integration was in the mid-1990s” [36]. Many companies still appear to be struggling with the implementation of inter-organizational systems (IOS) that are optimized for their needs.

The assessment of success and consequently the benefits arising from any kind of information system (IS) initiative is extensively addressed in the general IS literature [14], [15], [43], [14], [18], [8], [26] and the specialized IOS literature [30], [33], [51], [12]. Still, the realization of expected benefits is not shown in many cases [59], [47]. This situation arises partly due to insufficient use of IT investment evaluation methods and IT benefits realization processes [23], [66]. Additional complexity is added by the very nature of mostly intangible or soft benefits [6] that cannot be measured explicitly. A third influential factor, triggered by the different types of organizations, industries and business strategies (in various combinations), is created by an abundance of expected and realized benefits that cannot be identified easily [67].

The heterogeneous field of different types of benefits, different granularity of measurement/assessment methodologies/ methods and the need for a rigorous but nonetheless relevant approach motivated the following research question:

What kind of benefits can be achieved in real-world IOS implementations based on a common research methodology using a broad empirical database?

Our research seeks to use and extend a recently developed framework for the assessment of expected and realized benefits in organizations. The framework was developed with the help of an established case study methodology (eXperience, [56]), which is based on a comprehensive empirical database (more than 140 case studies) documenting real-world IS implementations.

The remaining paper is structured as follows: First, we will discuss the state of the art and the shortcomings in current research dealing with IS and IOS benefits. Next, we introduce our research methodology. We provide background information on the eXperience database and the expectations-benefits framework (exp-ben). The following chapter presents our research findings. The last chapter provides conclusions from this research, limitations and potential for further research.

2. Benefits of IS

Benefits of information systems (IS) and especially inter-organizational information systems (IOS) have been studied by academics for some decades. The assessment of any kind of added value to the organization proves to be challenging, as many perceived or expected benefits cannot be measured explicitly [15]; starting with pure cost-based benefits [2] the findings range from individual [64] to organizational impacts [43].

Given that IS benefits differ in scope, depth, and context several attempts have been made to create a classification of benefits. Classification frameworks range from models making a distinction between tangible, even measurable benefits, and intangible, so-called soft benefits [6], [45]. Additional kinds of benefits were grouped e.g. according to their nature into strategic, operational, transactional and tactical types [22], [28], [27], [21]. Prominent examples of IS impact research are contributions from DeLone and McLean [15], [14] who identified individual/organizational impact (original version) respectively net benefits (updated version) as dependent factors of system quality, information quality and service quality. Further work based on these models can be found e.g. in [29] or [18]. Up to now, these contributions remain on a rather high level of abstraction as the identification of common types of benefits can become difficult when dealing with different types of IS in different types of organizations [67].

Organizations and especially information systems themselves vary in scope, depth and context, which makes it hard to develop a generic model of perceived or expected benefits. Therefore, a number of researchers focused on sub-dimensions such as consumer impacts [7] or inter-organizational impacts [20] [51] when dealing with benefit types, ERP systems [57], Customer Relationship Systems [61] or Web Services [11] as the source of benefits.

Looking at the empirical background of most works (source of data) the diversity in number, type and focus group adds an additional level of complexity to the aforementioned discussion. They range from case studies to surveys or even experiments to derive qualitative findings or to prove hypotheses [28] [15] [21]. However, a broad and solid empirical database is seldom used [43]. Without a homogenous and structured elevation of empirical data the *comparability* of results derived from different sources (academic and/ or business) remains challenging.

3. Benefits of IOS

Similar observations can be made for the domain of inter-organizational information systems. As the name already suggests this special type of IS elevates the overall complexity of the IS benefits research field by including external factors (e.g. business partners, inter-organizational business processes).

Looking at the development of inter-organizational research, the first accomplishments in this area were made during the middle of the last century. Although electronic data interchange (EDI) remained mainly within the boundaries of the company, organization design and inter-organizational cooperation were already studied by several researchers as early as 1969 [19]. During the following years the term “Inter-organizational System” (IOS) was coined and founded a new stream of research [3] [1]. Dealing with topics like implementation and effects of EDI the scientific efforts focused usually on technical issues [13] [23] [30] [39].

The rise of the Internet era at the beginning of the 90’s gave new impulses to this research area. Electronic Commerce (EC) and Electronic Business (EB) added new perspectives as they introduced a more holistic view of the company and its business relationships. The pure technical-oriented approach was enriched by process-oriented and even institutional-oriented aspects [31] [65] [69].

Following the analysis of Chapter 2, similar observations can be made regarding the *scope*, the *source of data* and the overall *research approach* in a set of prominent IOS benefits research papers [51] [25] [11] [46] [20] [24] [30] [33] [49] [62] [63] [48] [44] [16] [9] [4] [58] [37] [17] [60] [12].

3.1. Scope

Most of the aforementioned research papers discuss impacts on different kinds of *organizational performance* [51] [30] [4] [48] [58], dealing with the relationship between intra- and inter-organizational collaboration, interdependent benefits from inter-organizational systems, the value creation through inter-organizational relationships, the perceived benefits of application integration users and benefits elevated by integration hubs. The results encompass a mere identification of factors influencing performance [51] to an analysis of strategic, operational and even cost-based benefits [30].

A second example for the diversity in IOS benefits research is provided by the contributions dealing with *B2B E-Commerce* and its impact on IT maturity, web-based procurement, the manufacturing industry sector and the overall impact on the organization [17] [37]

[60] [63]. With a narrower focus within the domain of IOS the results proved to be more precise with regard to e.g. the effect of transaction types on operational benefits [63] or cost-, relationship- and quality-issues of B2B E-Commerce systems [60] [37].

In our literature analysis, we looked at *Supply Chain* and *Supply Chain Management* with a focus on the buyer-supplier relationship and found a case study from the textile industry [24] [62] [9]. The study shows a positive impact on operational and strategic benefits [62] with even more detailed results like the improvement of product defect rates or quicker responses to market changes both for product replenishment and launches of new styles.

Further research could be identified on the value of *EDI* [25] [33], the operational and strategic impact of *E-Procurement* i.e. a scorecard-like classification of benefits [46] [44], the benefits of *Web Services* and the influence of IOS on *Business Transactions*, *Process Efficiency* and *Cooperative Strategy* [11] [20] [49] [16].

From the selected literature, five sub-domains could be identified that describe benefits impacting on either a part of an organization, the whole organization or even several organizations at the same time. These domains are B2B-Ecommerce, SCM, EDI, E-Procurement and Web Services. Additionally, four specific areas were found in which benefits can arise: Business Transactions, Process Efficiency, Cooperative Strategy and the overall Organizational Performance. The identification and analysis of IOS benefits that can occur within different levels of the inter-organizational collaboration (cf. for different integration levels to: Technical Integration: [39]; Organizational Integration: [40] [3] [35]; Institutional Integration: [10]) mainly encompass a partial analysis of a specific area in a specific domain.

3.2. Data source

Typical foundations of the findings in the IOS benefits research field are benefit frameworks or models that are empirically derived or tested. Six of the identified research papers represent positivist research using large-scale surveys to prove or reject a set of hypotheses [51] [49] [62] [44] [37] [17]. The studies differ in the number of participants (ranging from 39 to 245) and the informant groups are quite heterogeneous. High-level management participants (such as CEOs, IT executives or vice presidents) are most often addressed by the questionnaires [51] [49] [37] [17]. Two surveys include employees at all levels of the organization but fail to map the specific benefits to the specific groups of employees.

Case studies are another popular method for making use of empirical data [25] [20] [24] [33] [48] [9] [12]. Typically, the studies are limited to one or at most two in-depth case studies for a detailed and specific discussion about the benefits and their particular impact on the special case(s) presented. This approach leads to higher granularity in the overall benefits research but is simultaneously limited to its unique context, as it is not complemented by further comparable cases or other empirical data. Only one approach [33] uses 14 case studies to build on a broader and comparable empirical database but again is limited by its scope (benefits through EDI).

Further articles with an empirical background use interviews within their research domain, which also differ in focus groups and number. Some contributions are limited to the presentation of conceptual frameworks or models for IOS benefits. These models are still subject to empirical testing respectively validation.

3.3. Research approach

The research approaches used in previous literature are also characterized by inherent variance. Survey-based contributions are based on a positivist epistemology and are used to develop research frameworks based on hypotheses. Typically, some kind of benefit aspects respectively performance issues are defined as dependent variables. These range from organizational/ operational benefits to process efficiency. Although most of these studies show significant results, the comparability and hence the applicability of these research models is difficult due to different theoretical backgrounds, independent variables and hypotheses.

The same impression of diversity holds for the case study-based contributions. The frameworks used for structuring the case(s) and presenting the findings are difficult to consolidate. One framework deals with analytical lenses like business strategy, design/ logistical processes, cooperative strategies, IOS applications and market context [24]. Another attempts to categorize its findings according to the organizational setup, the information flows and their related documents [33].

There is no common or unified research approach that would allow the comparability of results. Furthermore, it is hard to identify a concept for future or ongoing research in terms of extending the empirical database or at least extending the knowledge gained so far by adding e.g. new benefit dimensions or identifying new triggers contributing to an overall benefit model.

Consequently, in our research we tried to overcome these deficiencies by applying and extending a recently developed framework for the assessment of expected and realized benefits in organizations. This framework was developed with a uniform research approach using an established case study methodology (eXperience, [56]), draws data from a comprehensive empirical database (more than 140 case studies) and has a distinct scope of real-world IS. The following paragraph explains the background of the existing methods that we used for our study.

4. Research approach

We follow an explorative research approach in adopting the aforementioned expectations-benefits framework (Exp-Ben). The Exp-Ben model was developed by Schubert and Williams [52] based on more than 140 case studies of real-world IS implementation projects. Due to the limited scope and depth of current frameworks for benefits identification and assessment the authors [52] set out to “(1) assist organizations locate and understand the benefits of their enterprise systems activities and (2) to contribute to extending current theorisations about the business benefits of enterprise systems“. This framework thereby covers potential deficiencies mentioned in chapter 3.3 (*Research Approach*).

As *data source* the Exp-Ben framework builds upon the eXperience case study database [56] (more than 140 case studies of real-world IS implementations). Its benefit categories and the benefits themselves were derived in a long-term cross-case analysis, which led to four benefit categories (Business Design, Management, Functional Areas and Information Technology and Infrastructure) and 68 benefits.

For our research the *scope* for applying the Exp-Ben framework was set to all eXperience case studies dealing with inter-organizational implementation projects (96 of 144 case studies). This seemed reasonable as (1) the assessment of the framework following the same methodology would lead to directly comparable results and (2) the findings would contribute to the continuous development of the Exp-Ben framework.

Case study research itself is widely accepted [32] and most suitable for understanding phenomena in organizational context [68] by either validating existing theories or inductive theory building [5]. Our research follows the first approach as we use an existing theory trying to validate and extend it in the specific topic area of IOS implementation projects. For the analysis of the data we used content analysis techniques described in [42] [34] [50].

The underlying case study method and our content analysis follow the steps suggested by the eXperience methodology [56].

4.1. eXperience case studies as data source

The eXperience methodology [56] provides a set of tools and methods to document cases on real-world IS implementations and has, over the last ten years, collected an extensive number of best practice experience reports. It was specifically designed for the collection and the transfer of information contained in a multi-level case study structure. The methodology is complemented by a toolset providing templates for (1) the writing of case studies, (2) a classification and electronic storage in an online database and (3) means for organizing events and/ or workshops for knowledge transfer and teaching. All cases follow a common classification scheme, which make them suited for a structured cross-case analysis.

The structure of a case represents the description of an existing enterprise system implementation and the complementary practices in an organization. It encompasses (1) a description of the organizations and actors involved, (2) the business scenario including the partners and the overall business strategy, (3) objectives, expectations and desired benefits, (4) the outcome of the project and (5) realized benefits/ advantages and shortcomings. A rigorous data validation and editorial process ensure veracity and quality before the case is published in the database.

4.2. Expectations-benefits framework

The development of the original expectations-benefits framework by Schubert and Williams [52] followed a three-step procedure: *Initialization phase*, *Exploration phase* and *Consolidation phase*.

The *initialization phase* included a thorough literature analysis of enterprise systems benefits and their implications followed by the development of corresponding research questions. The *exploration phase* consisted of a cyclical process of data reduction and coding where three independent researchers conducted a context analysis of a set of case studies and performed the corresponding coding. Codes were then reviewed and refined. This process was repeated with a next set of case studies. The *consolidation phase* at last served for the development of the final taxonomy by aggregating the collection of identified codes.

The model consists of four main categories where benefits could be identified: *Business Design*, *Management*, *Functional Areas* and *Information Technology & Infrastructure*.

Business Design incorporates benefits related to strategic objectives and the underlying processes and workflows. Typical criteria are complexity, integration, competitiveness or outsourcing. The *Management*

research approach, and (2) we *add to the existing content* of the expectations-benefits model by using the same taxonomy and thereby contributing to the continuous update process.

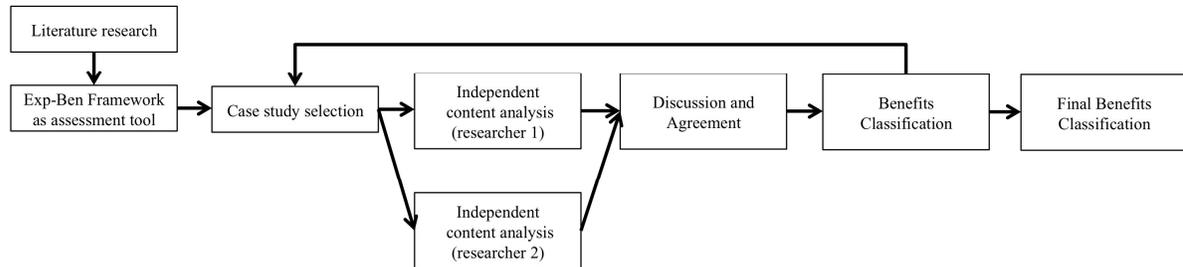


Figure 1. Research steps

category encompasses benefits around the access and use of resources, such as levels of employees, product design or cost aspects. Typical criteria are costs, productivity, availability or quality. The *Functional Areas* include elements of the organization’s value chain, e.g. modules and functions of an ERP-system. Typical criteria are quality of planning, sales chances, customer loyalty and quality of service. *Information Technology and Infrastructure* deal with inter- and intra-organizational technological components such as applications or databases. Typical criteria are availability, usability, reliability or stability.

The latest version of the model can be found in [55]. Due to its cyclical and iterative character the elements of the model (the actual benefits) are constantly being refined and new elements are added as more and more case studies are analyzed and added. Therefore, the list of potential benefits is never complete which contributes to a constant update of the database of benefit codes.

4.3. Research steps

Our own research focuses on the extension of the taxonomy for the sub-domain of inter-organizational implementation projects. As stated earlier, the eXperience database includes more than 140 case studies of enterprise systems implementations. Inter-organizational implementation scenarios are described in a significant number of these cases studies (96 of 144 cases).

We adapted a similar three-step procedure as Schubert and Williams [52] for the development of the original exp-ben model (cf. Figure 1). (1) We follow an *explorative research approach* as we deal with existing partial analyses without a general and holistic approach with respect to the research domain (scope), the empirical database (data source) and a common

Our approach started with a literature research and the development of our research question based on the state-of-the-art (cf. Chapter 3.1, 3.2 and 3.3). The content analysis was conducted by two independent researchers adapting the existing taxonomy of the expectations-benefits framework to a set of case studies with inter-organizational background. During

Table 1. Pre-developed classification scheme of integration scenarios for case study selection

Scenario Type	Description
Integration scenario 1	Realization of integration via an access gateway (e.g. order placement of a supplier via VMI access)
Integration scenario 2	Realization of integration via an integration gateway (e.g. order data transfer from an ERP-system to a Warehouse-Management-System)
Integration scenario 3	Realization of integration via an intermediary infrastructure (e.g. exchange of electronic invoices via an EDI network)
Integration scenario 4	Realization of integration via a direct access to a self-operated central system (e.g. exchange of order data between external locations/ service partners etc.)
Integration scenario 5	Realization of integration via a central integration platform (e.g. providing business process and data exchange between interest groups)

this iterative process we purposefully chose case studies for our analysis using a pre-developed classification scheme of integration scenarios based on the eXperience database ([53], [54]).

This classification scheme suggests five different types of inter-organizational implementation scenarios (cf. Table 1): (1) Parallel use of different information systems with manual external access, (2) Parallel use of different information systems with a direct partner integration, (3) Parallel use of different information systems by an intermediary, (4) Joint use of a self-operated, central system and (5) Joint use of a central system operated by an intermediary.

Instead of applying the expectations-benefits model to all 96 case studies we chose to select a subset of cases classified by the aforementioned classification scheme. We started our analysis by choosing one representative case for each integration scenario type. Based on the taxonomy of the expectations-benefits framework both researchers conducted a comprehensive content analysis verifying and complementing the so far developed coding scheme. After this step both researchers agreed upon the final list of benefits after a thorough discussion. This process was repeated several times. During this iteration phase it became obvious that there were (1) only few cases available for a deeper analysis of

manufacturing sector. Our evaluation results are presented in the following section.

5. Benefits in IOS implementations

Overall, we investigated 16 case studies (four of each integration scenario) in the manufacturing industry. This means every case study organization is a producer of certain goods or type of goods. The following discussion of our findings contains exemplary descriptions of the case study organizations.

5.1. Occurrence of benefits

We found that the overall occurrence of benefits is dependent on the benefit category and the integration scenario (cf. Table 2). The majority of the benefits could be found on the level of *Business Design*. The highest number (26) occurs in cases describing integration scenario 3 (Parallel use of different information systems by an intermediary). At a closer look all four case studies (Freitag, Pasta, Inficon and Schindler) contain a similar amount of benefits from

Table 2. Occurrence of benefits relative to integration scenario and benefits categories

	Integration scenario 1	Integration scenario 2	Integration scenario 3	Integration scenario 4	Total
Business Design	16	13	26	16	71
Management	11	11	8	4	34
Functional Areas	10	5	9	4	28
Information Technology & Infrastructure	15	10	17	15	57
Total	52	39	60	39	Sum = 190

integration scenario 5 (only 2 case studies) and (2) it would be reasonable to focus on one industry branch for better comparability. So we decided to use the same amount of four case studies for each remaining integration scenario (altogether 16 case studies) within the manufacturing sector (there were too few cases available for the other industry sectors).

Therefore, we were able to perform a comparative analysis with regard to occurrence in each scenario and preserve a higher degree of comparability by analyzing organizations from one industry sector, namely the

their inter-organizational scenario via the intermediary service provider. Three of four reported a significant reduction in process complexity, an increase of process efficiency and the potential for future growth.

All three benefits can be explained in connection with the role of the intermediary and its outsourcing services with respect to insufficient self-organized processes. The company Freitag wanted to pursue a more aggressive growth strategy including internationalization. The inter-organizational setup gave them the opportunity to integrate their sales processes with B2B and B2C customers alike. Inficon

and Schindler were seeking to expand their business with a new e-procurement system. Pasta Premium went through an organizational change and had to enter into a highly specialized food market sector.

The second area showing a lot of realized benefits is *Information Technology and Infrastructure*. Again, integration scenario 3 has most counts for benefits with both integration scenarios 1 (Bell, Chocolat Frey, Tris and Aebi) and 4 (Ziehl-Abegg, Scott, Abex, Strack) following close behind.

For this level, the results turned out to be more unique for each case. Ranging from benefits concerning data administration (e.g. availability or accurateness) to the software itself (e.g. preserving functionality or support of employees) the organizations provided no recognizable pattern or occurrence of certain IT-related benefits. This observation could be a hint towards the unique and distinct character of every kind of implementation project, making it hard to find a common pattern at least on the IT level.

Management benefits occur quite often in the first three integration scenarios. Not surprisingly, the main benefit in this category is the reduction of costs (overall 9 times), may it be one-time savings (e.g. license costs) or regular savings (e.g. process costs). The productivity is mentioned 5 times, the satisfaction of employees is mentioned 4 times. Interestingly, the employees seem to be more productive in integration scenario 1 (Parallel use of different information systems with manual external access). Trisa implemented a logistics system equipped with mobile handhelds that improved the internal logistics processes. Chocolat Frey set up a vendor-managed inventory for suppliers leading to improved capacity utilization. Aebi installed a portal for B2B customers thereby improving the efficiency of the CRM processes and leading to a more productive working environment. A causal relationship between integration scenario 1 and the improved employee productivity could not be identified directly. An investigation of more case studies allocated in the same scenario would be necessary.

The low occurrence of benefits in scenario 4 could be explained by the potentially high overload in managing a self-operated, central system to conduct inter-organizational collaboration. Only one organization (Ziehl-Abegg) named 3 of these 4 benefits located in cost improvement, reduction of complexity and the support of relevant activities.

The last benefit category (*Functional Areas*) is most often seen in integration scenarios 1 and 3 (10 resp. 9 times). Here, the availability of a functional integration with suppliers (4 times) and business partners (3 times) is seen as the most beneficial factor

within this category. The fairly low numbers in integration scenarios 2 and 4 are puzzling at first sight, but it seems as if the main focus within these scenarios are mainly customer-related benefits (6 of overall 9 beneficial effects).

Furthermore, both the *Management* and *Functional Areas* have a slightly lower number of benefits than the *Business Design* or the *Information Technology and Infrastructure* categories. Setting this into relation with the overall number of benefits identified so far in each category of the Exp-Ben framework (Business Design: 15, Management: 13, Functional Areas: 16 and Information Technology and Infrastructure: 24), it is remarkable that there are so many *Business Design* related beneficial effects within the inter-organizational settings. It seems as if collaboration projects have a higher perception rate as important strategic and organizational enablers.

5.2. Occurrence of unexpected benefits

During our analysis of the case studies we found that there were also unexpected benefits besides the expected or planned beneficial effects. *Unexpected* means that the noted beneficial effects were either *not expected beforehand* or *not defined beforehand*. In the first case the organization did not anticipate the benefits within their project planning. In the second case the benefits were somehow anticipated but not stated explicitly at the beginning of the case study.

The occurrence of unexpected effects was quite surprising. First of all, both categories *Business Design* and *Management* had the highest outcome of unexpected positive impact (23 both). Especially integration scenario 1 organizations found additional benefits (8 times). Chocolat Frey registered a significant optimization of their processes along with an increase of the attached business partners.

Trisa had to change their ERP system due to different reasons. Targets like customer/ supplier satisfaction were not the main focus of the case study but mentioned as a benefit from the implementation project.

Bell reached unexpected benefits by outsourcing the payroll process (for the management and board members). The specialized service provider offered services that had caused huge efforts to build up in an in-house solution (employee skills, legal requirements).

The remaining categories have hardly any surprising effect for the investigated organizations. The unexpected benefits with respect to the *Functional Areas* were related to customer satisfaction respectively the quality of service for the customer. IT-related benefits have a greater overall distribution within the set of criteria.

6. Summary and Conclusions

The existing heterogeneity in the research field of IS and IOS benefits (different types of benefits and different granularity of measurement/ assessment methodologies/ methods) motivated us to study the following research question:

What kind of benefits can be achieved in real-world IOS implementations based on a common research methodology with a broad empirical database?

We adapted a recently developed framework for the assessment of expected and realized benefits in organizations. This framework is built upon an established case study methodology (eXperience, [56]), based on an extensive empirical database (more than 140 case studies) consisting of real-world IS implementations.

We investigated 16 case studies (four of each integration scenario) in the manufacturing industry and identified 190 realized benefits in inter-organizational collaboration scenarios. Overall 59 of them were unexpected benefits occurring due to unknown side effects of the implementation project and its outcome or due to the missing explication at the beginning of the project. The results show a very differentiated and for each case study almost unique set of beneficial effects. The impacts on Business Design and IT have the highest occurrence from which several conclusions can be drawn based on the case study descriptions:

(1) In integration scenario 3 reduction in process complexity, increase of process efficiency and potential for future growth are likely to be achieved with an intermediary.

(2) Due to the unique and distinct character of every kind of implementation project, it is hard to find a common pattern at least on the IT level.

On the other hand, the low occurrence of benefits in some integration scenarios and categories lead to the following conclusions:

(3) A causal relationship between integration scenario 1 and the improved employee productivity could not be identified. An investigation of more case studies allocated in the same scenario would be necessary.

(4) Low beneficial effects with respect to resource management could be explained by the potentially high overload in managing a self-operated, central system to conduct inter-organizational collaboration.

A potential limitation of this study is the number of cases investigated. Further cases need to be identified to show or confirm *patterns* between benefits codes and company context and the fit of the findings with the expectations-benefits framework.

Following a thorough content analysis based on the expectations-benefits framework we were not able to

identify additional (new) benefits codes for the benefits framework ([52], [55]). Again, this may be due to the small number of case studies. It might also demonstrate that the code base is already sufficiently comprehensive.

8. References

- [1] R. Alt, and E. Fleisch, "Business Networking Systems: Characteristics and Lessons Learned", *International Journal of Electronic Commerce*, Vol. 5, No. 2, 2001, pp. 7-27.
- [2] J.A. Ballantine, R.D. Galliers, and S.J. Stray, "Information System/Technology Investment Decisions – The Use of Capital Investment Appraisal Techniques in Organisations", *Proceedings of the 1st European Conference on IT Investment Evaluation*, Henley, September 1994, pp. 148-66.
- [3] S. Barrett, and B. Konsynski, "Inter-Organisation Information Sharing Systems", *MIS Quarterly, Special Issue 1982*, pp. 93-105.
- [4] B.R. Barringer, and J.S. Harrison, "Walking a Tightrope: Creating Value through Interorganizational Relationships", *Journal of Management*, Vol. 26, No. 3, 2000, pp. 367-403.
- [5] T.V. Bonoma, "Case Research in Marketing: Opportunities, Problems, and a Process", *Journal of Marketing Research*, Vol. 22, No. 2, May 1985, pp. 199-208.
- [6] A. Brown, "Appraising Intangible Benefits from Information Technology Investment", *Proceedings of the 1st European Conference on IT Investment Evaluation*, Henley, September 1994, pp. 187-99.
- [7] E. Brynjolfsson, "The Contribution of Information Technology to Consumer Welfare", *Information Systems Research*, Vol. 7, No. 3, 1996, pp. 281-300.
- [8] E. Brynjolfsson, and L. Hitt, "Paradox lost? Firm-level Evidence on the Returns to Information Systems Spending", *Management Science*, Vol. 42, No. 4, 1996, pp. 541-558.
- [9] J. Carter, and L. Ellram, "The Impact of Interorganizational Alliances in Improving Supplier Quality", *International Journal of Physical Distribution and Logistics Management*, Vol. 24, Issue 5, 1994, pp. 15-23.
- [10] D. Chatterjee, A.H. Segars, and R.T. Watson, "Realizing the Promise of E-Business: Developing and Leveraging Electronic Partnering Options", *California Management Review*, Vol. 48, No. 4, 2006, pp. 60-83.
- [11] M. Chen, "An Analysis of the Driving Forces for Web Services Adoption", *Information Systems and e-Business Management*, Vol. 3, No. 3, 2005, pp. 265-279.
- [12] E. Christiaanse, "Performance Benefits through Integration Hubs", *Communications of the ACM*, Vol. 48, Issue 4, 2005, pp. 95-100.
- [13] T.H. Clark, and D.B. Stoddard, "Interorganizational Business Process Redesign: Merging Technological and Process Innovation", *Journal of Management Information Systems*, Vol. 13, Issue 2, 1996, pp. 9-29.

- [14] [W.H. DeLone, and E.R. McLean, "The DeLone and McLean Model of Information Systems Success: A ten-year Update", *Journal of Management Information Systems*, Vol. 19, No. 4, 2003, pp. 9-30.](#)
- [15] [W.H. DeLone, and E.R. McLean, "Information Systems Success: The Quest for the Dependent Variable", *Information Systems Research*, Vol. 3, No. 1, 1992, pp. 60-95.](#)
- [16] [J.H. Dyer, and H. Singh, "The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage", *Academy of Management Meetings*, Cincinnati, 1996.](#)
- [17] [E. Elia, L.A. Lefebvre, and E. Lefebvre, "Focus of B-to-B E-Commerce Initiatives and Related Benefits in Manufacturing Small and Medium-Sized Enterprises", *Information Systems e-Business Management*, Vol. 5, No. 1, 2007, pp. 1-23.](#)
- [18] [G. Gable, D. Sedera, and T. Chan, "Re-conceptualizing Information System Success: The IS-Impact Measurement Model", *Journal of the Association for Information Systems*, Vol. 9, Issue 7, 2008, pp. 377-408.](#)
- [19] [J.R. Galbraith, "Organization Design: An Information Processing View", *Interfaces*, Vol. 4, Issue 3, 1969, pp. 28-36.](#)
- [20] [J. Gebauer, and P. Buxmann, "Assessing the Value of Interorganizational Systems to Support Business Transactions", *Journal of Management Information Systems*, Vol. 4, Issue 4, 2000, pp. 61-82.](#)
- [21] [G.M. Giaglis, N.A. Mylonopoulos, and G.I. Doukidis, "The ISSUE Methodology for Quantifying Benefits from Information Systems", *Logistics Information Management*, Vol. 12, Issue 1-2, 1999, pp. 50-62.](#)
- [22] [A. Gunasekaran, P.E.D. Love, F. Rahimi, and R. Miele, "A Model for Investment Justification in Information Technology Projects", *International Journal of Information Management*, Vol. 21, No. 5, 2001, pp. 349-346.](#)
- [23] [L.M. Hitt, and E. Brynjolfsson, "Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value", *MIS Quarterly*, Vol. 20, No. 2, 1996, pp. 121-142.](#)
- [24] [C.P. Holland, "Co-operative Supply Chain Management: The Impact of Interorganizational Information Systems", *Journal of Strategic Information Systems*, Vol. 4, No. 2, 1995, pp. 117-133.](#)
- [25] [M.R. Hoogeweegen, R.J. Streng, and R.W. Wagenaar, "A Comprehensive Approach to Assess the Value of EDI", *Information & Management*, Vol. 34, Issue 3, 1998, pp. 117-127.](#)
- [26] [C. Iacovou, I. Benbasat, and A. Dexter, "Electronic Data Interchange and Small Organisations: Adoption and Impact of Technology", *MIS Quarterly*, Vol. 19, No. 4, 1995, pp. 495-479.](#)
- [27] [Z. Irani, "Information Systems Evaluation: Navigating Through the Problem Domain", *Information & Management*, Vol. 40, No. 1, 2002, pp. 11-24.](#)
- [28] [Z. Irani, and P.E.D. Love, "Developing a Frame of Reference for Ex-Ante IT/IS Investment Evaluation", *European Journal of Information Systems*, Vol. 11, No. 1, 2002, pp. 74-82.](#)
- [29] [J. Ivari, "An Empirical Test of the DeLone-McLean Model of Information Systems Success", *The DATA BASE for Advances in Information Systems*, Vol. 36, No. 2, 2005, pp. 8-27.](#)
- [30] [H.R. Johnston, and M.R. Vitale, "Creating Competitive Advantage with Interorganizational Information Systems", *MIS Quarterly*, Vol. 12, No. 2, 1988, pp. 153-165.](#)
- [31] [P.G.W. Keen, and M. McDonald, *The e-Process Edge: Creating Customer Value and Business Wealth in the Internet Era*, McGraw-Hill, Berkeley, 2000.](#)
- [32] [H.K. Klein, and M.D. Myers, "A Set of Principles for Conducting and Evaluating Interpretive field Studies in Information Systems", *MIS Quarterly*, Vol. 23, No. 1, March 1999, pp. 67-94.](#)
- [33] [H. Krcmar, N. Bjorn-Andersen, T. Eister, J. Griese, T. Jelassi, R. O'Callaghan, P. Pasini, and P. Ribbers, "EDI in Europe - Empirical Analysis of a Multi-Industry Study", Working Paper no. 49, Universitat Hohenheim, Stuttgart, 1993.](#)
- [34] [K. Krippendorff, *Content Analysis: An Introduction to Its Methodology*, \(2nd Edition\), Sage Publishing Inc., Thousand Oaks, CA, 2003.](#)
- [35] [K. Kumar, and H.G. van Dissel, "Sustainable Collaboration: Managing Conflict and Cooperation in Interorganisational Systems", *MIS Quarterly*, Vol. 30, No. 6, 1996, pp. 484-497.](#)
- [36] [B.J. Lheureux, P. Malinverno, and L.F. Kenney, "Key Issues for Multienterprise B2B Integration", Technical Report G00165369, Gartner Research, 2009.](#)
- [37] [C. Lin, Y. Huang, and J. Burn, "Realising B2B e-Commerce Benefits: The Link with IT Maturity, Evaluation Practices, and B2B e-Commerce Adoption Readiness", *European Journal of Information Systems*, Vol. 16, No. 6, 2007, pp. 806-819.](#)
- [38] [P. Love, Z. Irani, C. Standing, C. Lin, and J. Burn, "The Enigma of Evaluation: Benefits, Costs and Risks of IT in Small-Medium Sized Enterprises", *Information and Management*, Vol. 42, Issue 7, 2005, pp. 947-964.](#)
- [39] [B. Massetti, and R.W. Zmud, "Measuring the Extent of EDI Usage in Complex Organisations: Strategies and Illustrative Examples", *MIS Quarterly*, Vol. 20, No. 3, 1996, pp. 331-345.](#)
- [40] [A. McAfee, "Enterprise 2.0: The Dawn of Emergent Collaboration", *MIT Sloan Management Review*, Vol. 47, No. 3, 2006, pp. 21-28.](#)
- [41] [M.P. McDonald, "Executive Summary: Meeting the Challenge: The 2009 CIO Agenda", Gartner Executive Program Report, 2009.](#)
- [42] [M.B. Miles, and A.M. Huberman, *Qualitative Data Analysis - An Expanded Sourcebook*, Sage Publications, 2nd ed., Thousand Oaks, 1994.](#)
- [43] [R. Mirani, and A.L. Lederer, "An Instrument for Assessing the Organizational Benefits of IS Projects", *Decision Sciences*, Vol. 29, Issue 4, 1998, pp. 803-838.](#)
- [44] [T. Mukhopadhyay, T., and S. Kekrei, "Strategic and Operational Benefits of Electronic Integration in B2B Procurement Processes", *Management Science*, Vol. 48, No. 10, 2002, pp. 1301-1313.](#)

- [45] [D.E. O’Leary, “Enterprise Resource Planning \(ERP\) Systems: An Empirical Analysis of Benefits”, Journal of Emerging Technologies in Accounting, Vol. 1, 2004, pp. 63-72.](#)
- [46] [W. Piotrowicz, and Z. Irani, "Analysing B2B Electronic Procurement Benefits: Information Systems Perspective", Journal of Enterprise Information Management, Vol. 23, Issue 4, 2010, pp. 559-579.](#)
- [47] [P. Quattrone, and T. Hopper, “What does Organizational Change mean? Speculations on a Taken for Granted”, Management Accounting Research, Vol. 12, Issue 4, 2001, pp. 403-435.](#)
- [48] [F.J. Riggins, and T. Mukhopadhyay, "Interdependent Benefits from Interorganizational Systems: Opportunities for Business Partner Reengineering," Journal of Management Information Systems, Vol. 11, No. 2, 1994, pp 37-57.](#)
- [49] [K.A. Saeed, M.K. Malhotra, and V. Grover, “Examining the Impact of Interorganizational Systems on Process Efficiency and Sourcing Leverage in Buyer-Supplier Dyads”, Decision Sciences, Vol. 36, Issue 3, 2005, pp. 365-396.](#)
- [50] [J. Saldaña, The Coding Manual for Qualitative Researchers, Sage Publications, London, 2009.](#)
- [51] [N.R. Sanders, “An Empirical Study of the Impact of E-Business Technologies on Organizational Collaboration and Performance”, Journal of Operations Management, Vol. 25, Issue 6, 2007, pp. 1332-1347.](#)
- [52] [P. Schubert, and S.P. Williams, “An Extended Framework for Comparing Expectations and Realized Benefits of Enterprise Systems Implementations”, Proceedings of the 15th Americas Conference on Information Systems, San Francisco, California, 2009.](#)
- [53] [P. Schubert, “Integration Scenarios for Business Collaboration”, Proceedings of the 14th Americas Conference on Information Systems, Toronto, Canada, 2008.](#)
- [54] [P. Schubert, and C. Legner, “B2B Integration in Global Supply Chains: An Identification of Technical Integration Scenarios”, Journal of Strategic Information Systems, in print.](#)
- [55] [P. Schubert, and S.P. Williams, “A Framework for Identifying and Understanding Enterprise Systems Benefits”, Business Process Management Journal, Vol. 17, No. 5, 2011.](#)
- [56] [P. Schubert, and R. Wölfle, “The eXperience Methodology for Writing IS Case Studies”, Proceedings of the 13th Americas Conference on Information Systems, Keystone, Colorado, 2007.](#)
- [57] [S. Shang, and P.B. Seddon, “A comprehensive Framework for Classifying Benefits of ERP Systems”, Proceedings of the 2000 Americas Conference on Information Systems, Long Beach, California, 2000.](#)
- [58] [L.A. Singletary, and S. D. Pawlowski, “What is Applications Integration? Understanding the Perspectives of Managers, IT Professionals, and End Users”, Proceedings of the 9th Americas Conference on Information Systems, Tampa, Florida, 2003.](#)
- [59] [L. Staehr, “Understanding the Role of Managerial Agency in Achieving Business Benefits from ERP systems”, Information Systems Journal, Vol. 20, Issue 3, 2010, pp. 213-238.](#)
- [60] [C. Standing, and L. Chad, “Organizational Evaluation of the Benefits, Constraints, and Satisfaction of Business to Business Electronic Commerce”, International Journal of electronic commerce, Vol. 11, No. 3, 2007, pp. 107-134.](#)
- [61] [M. Starkey, and N. Woodcock, “CRM Systems: Necessary, but not Sufficient. REAP the Benefits of Customer Management”, Journal of Database Marketing, Vol. 9, No. 3, 2002, pp. 267-275.](#)
- [62] [M. Subramani, “How Do Suppliers Benefit from Information Technology Use in Supply Chain Relationships,” MIS Quarterly, Vol. 28, No. 1, March 2004, pp. 45-73.](#)
- [63] [C. Subramaniam, and M.J. Shaw, “A Study of the Value and Impact of B2B E-Commerce: The Case of Web-Based Procurement”, International Journal of Electronic Commerce, Vol. 6, No. 4, 2002, pp. 19-40.](#)
- [64] [G. Torkzadeh, and W.J. Doll, “The Development of a Tool for Measuring the Perceived Impact of Information Technology on Work”, The International Journal of Management Science, Vol. 27, Issue 3, 1999, pp. 327-339.](#)
- [65] [N. Venkatraman, and J.C. Henderson, “Real Strategies for Virtual Organizing”, Sloan Management Review, Vol. 40, Issue 1, 1998, pp. 33-48.](#)
- [66] [J. Ward, and E. Daniel, Benefits Management: Delivering Value from IS & IT Investments, John Wiley and Sons Ltd, Chichester, UK, 2006.](#)
- [67] [P. Weill, “The Relationship Between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector,” Information Systems Research, Vol. 3, No. 4, 1992, pp. 307-333.](#)
- [68] [R.K. Yin, Case Study Research – Design and Methods, Sage Publications, 3rd ed., Thousand Oaks, 2003.](#)
- [69] [V. Zwass, “Electronic Commerce: Structures and Issues”, International Journal of Electronic Commerce, Vol. 1, No. 1, 1996, pp. 3-23.](#)