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Article

Bridging the Service Gap - Business Process Redesign & Information Technology as Multidimensional Success Driver for Logistics Service Providers

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Bridging the Service Gap - Business Process Redesign & Information Technology as Multidimensional Success Driver for Logistics Service Providers

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- Research questions:** Attaining competitive advantages is a result of satisfying customer demands with a certain service/product composition. The business process model approach has become popular in order to meet service needs. In addition more and more companies create value along supply chains and the function of logistics becomes part of such a value creation. Collaboration is one major influencing success factor. By adjusting to market changes companies focus on internal processes and costs instead of targeting on customer and supply chain total benefits/costs and especially quality chances. Restructuring business processes therefore is estimated to be under evaluated. IT hereby shows a manifold impact. This value is analyzed and conducted on an ongoing business process redesign project of a logistics service provider (LSP).
- Methods:** The theoretical part of the paper illustrates the framework of business processes, evaluation, development of redesign techniques and strategies by linking this background to the role of IT with focus on a customer service process. In a second step an equitation model evaluates hypotheses from a LSP and customer perspective in order to formulate innovation potentials targeting the customer collaboration process.
- Results:** The findings express the need to overcome company borders in supply chains, include partners and use IT tools to develop information quality to raise a final higher customer satisfaction. Companies rely more and more on their networks, while cost and business process programs don't include relationship and process gains. Especially the impact of rising information quality in the supply chain gives the possibility to evaluate and raise quality developments.
- Structure of the article:** 1. Introduction; 2. Theoretical Framework; 3. Methodical Framework; 4. Methodology; 5. Conclusions; 6. About the Authors; 7. References

1. INTRODUCTION

1.1 Content

Due to increasing customer demands for more customized products and service offers, individual firms and supply chains (SC) as a whole are looking for new

and innovative ways to achieve competitive advantage. In addition markets win in transparency, offer visual points of optimization as well as new docking points for processes. With respect to multiple environmental trends LSPs recently increased the need to be more innovative (BUSSE & WALLENBURG, 2011). Firstly

LSPs extend their services to more sophisticated solutions (LANGLEY, 2010), secondly globalization goes hand in hand with consolidation and increased competition and the need to be more innovative (RÖTH, 2011); Thirdly, the environmental trend in deregulation (GUDEHUS & KOTZAB, 2012) which increases competition in terms of costs and quality.

On the other hand BUSSE & WALLENBURG (2011) underline the low innovation investments of LSPs and demand an improved focus on innovation management in the respective market, although customers expect new and innovative solutions from their LSPs. In addition studies over the last five years indicated concerns and dissatisfactions with the quality provided (LANGLEY, 2010).

The increasing logistics service supply market and subsequently increasing competition forced LSPs to search for new sources of competitive advantages. Hereby Information and Communication Technology becomes a main driver and field for the development of sophisticated solutions (LUNA & FRIES, 2011). Those promised investments are also a statement of the reliability and management willingness to outsource.

Entities in general, and in this focus LSP underlie flexible behaviors in their organizational structure to meet original end manufacturers' (OEM) expectations. Here, the business model approach has become popular in recent years (OSTERWALDER ET AL., 2005), partly because continuously changing business processes and operations have to meet the needs of the marketplace (BASK ET AL., 2010).

Business process redesign (BPR) or reengineering consulting services have proliferated (KETTINGER ET AL., 1997). Planning approaches therefore concentrate on strategy, people, structure, management and technology dimensions.

Management decisions to initiate such programs are often driven by financial data. This might be caused through worse developments in business results, customer pressure, technological developments etc. Such decisions are often based on so called business plans clarifying the eligibility criteria for expenditures. Often return on invest (ROI) calculations are needed.

In terms of technological BPR projects, calculations concentrate on the improvements of process efficiencies and stabilizations. In order to justify such information technology (IT) investments, calculations focus on savings in admin and shopfloor personnel linked to economies of scales. SCs can be designed to meet specific needs of customer segments; processes might be created, whereas it will be a considerable interest to look on the SC relationships and development of quality within. Often underlying soft impacts like process stability, visibility and traceability are not seen. IT advantages in these considerations offer wide impacts on quality. In addition companies acting in close partnerships of SCs might offer benefits (in terms of quality and costs) for all contributing SC partners.

Global statements in current literature therefore describe well defined processes and IT-systems as major success factor for LSPs (FÜRSTENBERG, 2010). In this environment IT-integration and process improvements are further focused.

1.2 Goal of the study

Nearly one third of small and medium sized enterprises (SME) don't use IT-service management (ITSM). Cost restrictions overlie requirements for process quality. On the other hand literature widely acknowledges the usage of IT as a major success driver for SME. Although SME know their need for closeness to customers, companies avoid tight IT-collaborations with such business partners (TOKAR, 2010). In addition latest technological developments show a radical change of work places. New forms of highly flexible cooperation and communication between employees (and customers) need transparency and traceability in their business processes

In terms of LSP services, this paper focuses on SME which mainly services target groupage (KLAUS ET AL., 2011) and further value added services. The current market volume for such services lies at EUR. 38 bn. and around 90 per cent of the market which are assumed to be outsourced (KLAUS ET AL., 2011). Top players are predominantly originated in Germany. More or less regional companies build European networks. One major question being discussed is the survival of such organizations in the long term or whether they will merge in affiliated groups. KLAUS ET AL. (2011) formulates for SME the need to prepare for the future. SME needs to cope with lower price offers of larger groups and to focus on value added services to be established as niche players. Companies not attaining such challenge fear danger to be part of consolidations via acquisitions by other providers.

This business case provides a practical case of a LSP-OEM relationship and it's demand for restructuring its IT services in close linkage to the customer service process. Here the focus to redesign processes will be analyzed.

Focusing customized IT also means to ensure efficiency due to lower transaction costs and higher quality in complex processes. It implies costs, which to a certain extent have to be evaluated for their "cash-back" relevance. By reviewing academical journals and researches through a broad keyword search, theoretical framework has been investigated and related content incorporated. Based on the business case, demands and success drivers for the future vitality of the partnership have been illuminated in order to value the need to foster collaboration in service processes.

2. THEORETICAL FRAMEWORK – CHANGE IN TERMS OF SUPPLY CHANGE MANAGEMENT & BUSINESS CHANGE

Focusing on logistics operations (processes) LSP are responsible for the efficient and effective handling of firm's goods (CHRISTOPHER, 2011). Efficiency and effectiveness in conclusion are no stable elements. Acting with change in SCs brings the need to a Supply Chain Organisation (SCO) philosophy with the ability to consciously cope with new conditions and circumstances (FORD & FORD, 1995).

With an increasing demand for individualization of products and services, increase of variants (and the necessary technological background knowledge), the higher demand in compliance regulations have resulted in higher coordination costs in all steps of a SC (ADAM, 1998). ADAM & ROLLBERG created already in 1995 the synonym of a so-called complexity-trap, "in which overhead costs for additional control and coordination systems increase more than the additional revenues achieved through services" (ADAM & ROLLBERG, 1995, p. 667). Therefore organizational areas faced an increased coordination demand across interfaces preventing the efficient value creation (dysfunctions; FISCHERMANN, 2006). Classically growing companies (including LSP) face the increasing challenge to realize internal success potentials. In addition redundancies and non transparent activities create cost intensive coordination. Companies undergoing such process tend to lose the focus on customers and in contrary focus on the internal view.

Instead of choosing between the organizations own interests, the focus is the interests of all SC participants (KETCHEN & HULT, 2007). Especially in B-2-B processes traditional structures tend to encounter their limit (SCHEER ET AL., 2005). In general, customer demands and innovative products call for "higher levels of SC flexibility and responsiveness (LAO ET AL., 2010). Especially SME confirmed business process modeling as a success driver with highest priorities (IDS SCHEER, 2012).

With the given raise of complexity and requirements, firms have to spend a vast amount of resources in order to improve their competitiveness by looking on internal processes. The management and improvement of BPs are core tasks of organizational design (RÖGLINGER ET AL., 2012) and meanwhile focus on logistics academic papers (WALLENBURG ET AL., 2010).

2.1 Information driven process redesign

Resource advantages theories have important implications for the logistics industry as the market is recently undergoing a concentration of suppliers and commoditization of services (KLAUS, 2011; CAPGEMINI, 2008; LIEB, 2007).

Following the resource based view (RBV) (Barney, 1991) IT usually does not directly foster competitive advantage, but provides capabilities that may lead to enhanced operational performance (Kros et al., 2011) due to various effects on efficiency, effectiveness and resiliency (Grant, 2010). Prior RBVs, located sources of competitive advantage in internal capabilities. Later services as a supporting role in enabling a firm to achieve a competitive advantage were named. However EVANGELISTA (2012) states a shift from RBV to process and knowledge based approaches through IT. Information in logistics research has long been viewed as a critical factor (GOLICIC ET AL., 2012) and named as one of the most managerially relevant research topics in SCM (THOMAS ET AL., 2011). Information advantage is therefore less vulnerable to substitutes, more difficult to imitate, duplicate or purchase (HUNT, 2000; LAI ET AL., 2008). In general logistic companies with greater access to new, external information (in comparison to competitors) will have more opportunity to apply it more efficiently and effectively (CANTOR & MACDONALD, 2009).

Academic papers in addition, state the thesis that information overload by individuals is not valid, as quantity is seen as variable analyzed through the firm rather than the individual (GOLICIC ET AL., 2012). Thus, information needs to be interpreted through electronic channels. Here information quality also focuses the mitigation of mistakes and redundancies through higher quality information, which increases efficiency (and impacts costs; GOLICIC ET AL., 2012); Timely market information raises firms informational advantage and may support business-to-business services.

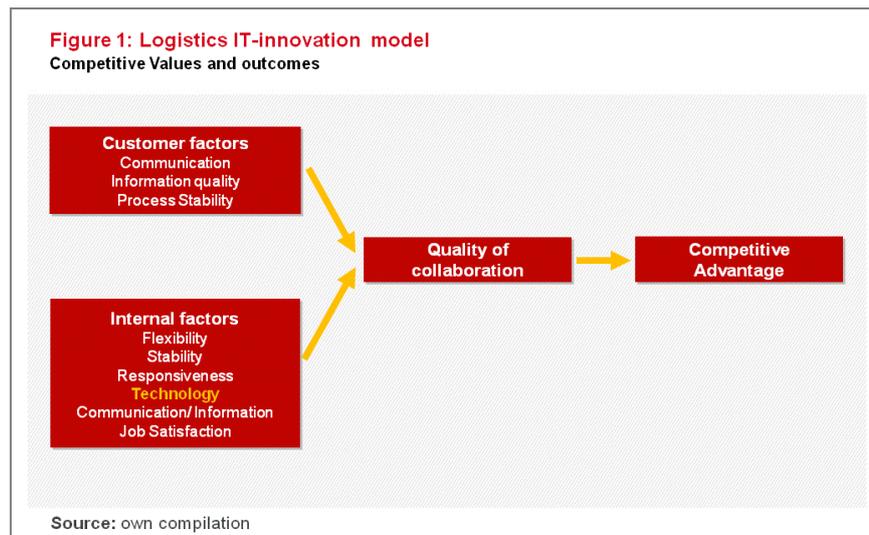
In conclusion information-focused capabilities are increasingly viewed as enabler of improved firm performance (BARTLETT ET AL., 2007; FUGATE ET AL., 2010; LUMSDEN & MIRZABEIKI, 2008). Here, general developments and latest studies grant IT logistics a special role for future challenges of this branch where LSP show a general cautious behavior (TEN HOMPEL, 2012). While the dependency is still growing, main barriers are low IT-budgets and the uncertainty in the compatibility of systems (flexibility to adjust demands to different customers, changing products, etc.). As a second major restraint SME logistic companies fear handling and support costs by external and internal service providers, as IT expert staff is mostly not available for such companies (TEN HOMPEL, 2012). LSP have traditionally been cautious about investing in innovative and costly IT (O'REILLY, 2007). This may be explained through the social exchange theory stating that exchange relationships between actors are being contingent upon rewarding reactions from others. Here firms tend to believe that adopting collaborative technology will only be beneficial for the other organization. Therefore, companies facing such decisions may not be motivated to successfully implement the usage (HAZEN &

BYRD, 2012). Often the risk of large failed IT investments results due to not supported willingness to share needed information.

IT is a vital element for LSP performance as the integration of logistics provider systems with its clients is a central must (PRAJAGO & OLHAGER, 2011) and part of a strategic perspective (BASK, 2001). Here logistics innovation is positively related to a firm's competitive advantage (cf. FIGURE 1).

Recently, central phenomenon of management and organizational research are organizational boundaries.

NIEHAVES & PLATTFAUT (2011) acknowledge that business processes are highly cross-organizational but face the existence of organizational boundaries. Process improvement has driven firms not only to focus on internal operations but also customer orientated ones (PRAJAGO & OLHAGER, 2011). Collaboration has been cited as one of the most important elements in supply chains (RICHEY ET. AL., 2012) – elements to be reviewed in the context of IT.



2.2 IT fostering Collaboration

With the spot on IT investments during BPR newer surveys focusing IT expenditures state the improvement of operational efficiency as the key motivation factor. In addition improving customer service came close as second motivating factor (N.N., 2011). Newer publications tend to include the new dimension of service in definitions of BPR (Altinkemer et al., 2011, p. 130). The fundamental new design brings the chance to directly anchorage quality in new processes to raise the customer value (Giebel, 2010). For the last ten years the value of customer relations and therefore the focus on continuous fostering of such relations increased (Merzenich, 2011). Capital expenditures in such an area mainly describe immaterial resources. LSP in general face the dilemma in quality and financial performance perspectives as customers expect lean solutions (Gotzamani et al., 2010). In order to support management decisions for innovations, potentials (also in terms of quality) need to be made visible. Up till today there are now valid and widely accepted performance measure concepts for BPR approaches.

Focusing the impact of process innovations in terms of success, internal and external customer (Göbl / Froschmayer, 2011) satisfaction in service processes need to be considered (Bodet, 2008).

Long term success is no longer gained through qualities and optimized services/products. Alternatively firms foster efforts in the field on a long term customer

relationship (Atalik & Arslan, 2009; Marquardt et al., 2011). Higher levels are characterized through increased logistics-integrated communication (Prajogo & Olhager, 2011). Integrative efforts among partners will be described as collaborative planning, forecasting and replenishment.

In consequence integration in SC supports the coordination of logistics and service activities. Here information collaboration refers to the “sharing of key information” enabled by IT (Prajogo & Olhager, 2011, p. 514). Sheu et al. (2006) concluded a direct correlation of IT capabilities and better communication to engage problem solving activities. Richey et al. (2012) stated technological innovation and technological complementarity as positive related to higher levels of collaboration in logistics services. Studies on boundaryless organizations focus greater flexibility and responsiveness to change and enable the free exchange of information and ideas. Authors argue that such organizations promote better and closer partnerships with customers (and suppliers).

2.3 The Process “Customer Service”

For five years the role of logistics service as a “co-creating value” has been gaining attention in literature (YAZDANPARAST ET AL., 2010). In this context customer service is an emotional wording bringing up different experiences and views. In terms of this paper customer service describes the ability of an organization

to constantly and consistently exceed the customer’s needs and expectations. Following BOLTON ET AL. (2007) leveraging such logistics service can help to build strong relationships with customers, generate barriers to competition, increase customer loyalty and switching costs, and make market activities more efficient. There is also widespread recognition that customer service is a key driver of competitive advantage (PICOLLI ET AL., 2009). In general the customer process is a synonym for a knowledge intensive process (LINK, 2009). It is hereby a source of major competitive values. RONGROOS (1994) hereby delucilated the shift from a marketing mix to relationship marketing. As implementation of CRM is elusive for most companies (even LSP), firms mostly do not understand that it requires company wide, cross functional BPR (CHEN & POPVICH, 2003).

While many academical papers state the important role of innovation for LSP, much is unknown and less research has focused on it (DAUGHERTY ET AL., 2011; GRAWE, 2009). Thus, in the purpose of this paper, service innovation and its impact on the shift from a functional to a process organization needs to be spotted. Here, structural antecedents may influence the creation of logistics innovation capabilities and impact the firm (service) performance.

Innovation capability in the sense of this business case describes the creation of value for customers, employees, alliance partners (e.g. transportation networks), and communities through new and/or improved service processes (adopted from OSTROM ET AL., 2010).

3. METHODOLICAL FRAMEWORK FOR THE EMPIRICAL EXAMINATION OF CUSTOMER AND QUALITY VALUE IN BPR-PROJECTS

Several studies of the past years tried to focus on logistics service with different frameworks (e.g.

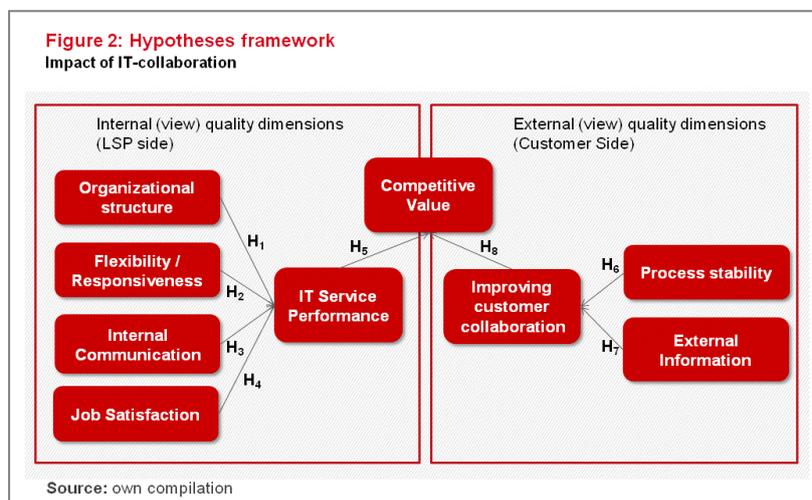
RAFELE, 2004). Most common studies are used with the aim to measure and monitor business processes performance. The derivation of financial figures proved the general conduction of BPR success through output quantity, assets and capital costs (ALTINKEMER ET AL., 2011). Studies on firm performance (labour productivity, financial performance, etc) are widely drawn while information management (application of IT) as a whole is hardly considered as a powerful source of competitive advantage; it hides several beneficial aspects in non-financial dimensions which are targeted by this paper.

By reviewing chapter 1 and 2 and further expert interviews, as well as customer and sales feedback, main competitive values could be grouped on an internal and external view (cf. FIGURE 1).

With focus on IT performance customer and own organizational impacts were detailed to factors influencing process stability (organizational structure), quality of data (flexibility and responsiveness), quality of communication/ information and impacts on job satisfaction.

A first analysis of reoccurring named fundamental drivers targeted factors of IT performance. The proposal of this paper therefore focuses on the multivariate influence resulting in performance and most named need for collaboration – both intending to influence the unique selling preposition and supporting a competitive value. FIGURE 2 therefore shows the structural model as a set of latent construct variables as cause-effect information. Arrows hereby argue causal assumptions (causal modeling). Structural equation modeling hereby has been developed to a meaningful statistical approach to evaluate and test hypotheses (JAHN, 2007) for behavioral and social-economic dimensions.

Improving named capabilities as relational interactions with customers leads to a higher chance of market survival (cf. LSP market situation in KLAUS, 2011) and subsequently leads to the general overhead assumption of “IT as a multidimensional success driver for logistics service provider”.



3.1.1 Business Process Stability

3.1.2 Organizational (internal) structure

Organizational structure and IT-support will have a positive effect on the dimension “specialization” as performance indicator. Here workflows and structured (specialized) tasks will allow a coordination and division of work into smaller tasks (Olson et al., 2005).

HYPOTHESIS H₁

BPR with its impact on organizational (internal) structure is positively related to IT service performance.

3.1.3 Process Stability (External)

New process orientation splits past tasks and aligned future workflows. In order to increase effectiveness and efficiency, process stability is the major factor for service outcome in terms of reliability (as ability to perform the promised service dependably and accurately).

HYPOTHESIS H₆

BPR with its impact on external process stability is positively related to improved customer collaboration.

3.2 Flexibility & Responsiveness

In terms of manufacturing research the well known phenomena of bottlenecks (stage-spanning or floating) is describing reduced effectiveness of organizations; an approach which can be mirrored to “manufacturing” of services in multistage SCs. Beside managing resources in companies (to avoid bottlenecks) the topic of process flexibility has become the centre of attention for research institutions (MULYAR ET AL., 2008). Success in LSP is largely dependent on responsiveness (ELLINGER ET AL., 2010). It is well known that more flexibility leads to better operational performance (AKSIN & KARAESMEN, 2006). IT is hereby supposed to support organizations operating in a dynamic context. Besides given process stability through IT modeling, flexibility by design gives the ability to incorporate alternative execution paths. However, given that there are costs associated with creating and maintaining this flexibility, and difficulties managing the resulting more complex system, it is desirable to create an IT support.

Responsiveness on the other hand expresses the willingness to help customers and to provide prompt service through the internal ability to overview all crucial service determinants (transport, personnel and its qualifications, special equipment, tooling, subcontractors, travel restrictions and necessary forerun, etc.). Responsiveness may be one of the most important capabilities needed for firms to achieve competitive advantage (REICHHART & HOLWEG, 2007).

HYPOTHESIS H₂

BPR with its impact on flexibility and responsiveness is positively related to IT service performance.

3.3 Communication & Information

Management of internal and external information in terms of quantity and quality are drivers of informational advantage (PRAJAGO & OLHAGER, 2011).

3.3.1 Internal: Communication

Availability of information improves decision making (Lin & Wu, 2006). According to Klein et al. (2007) the intensity of communication states a high degree of cooperative behavior. In contrast lack of information leads to poor decisions or inability to act timely and therefore communicate timely to the customer (Mohr & Sohi, 1997). Raising quantity of information exceeds the capacity to process IT and creates information overload which therefore impacts order planning and execution. Internal information sharing will foster the dimension of assurance (with the raise of knowledge and courtesy) of employees and their abilities to convey trust and confidence.

Based on the explained function of decentralization for LSP innovation capability, decentralized organizations (Business Case) tend to highly share information.

HYPOTHESIS H₃

BPR with its impact on (internal) communication is positively related to IT service performance.

3.3.2 External: Information

Information quality in addition focuses completeness, credibility and timeliness availability of information. In addition such dimensions need to match with user needs. Information provided in terms of quality will support operational and strategic business processes. LI & LIN (2006) illustrated the timely availability of such information as effective dimension to create value perceived by the customer.

IT can hereby support the unscheduled cross-functional interactions that provide opportunities for innovative thinking towards the customer.

In addition doubled information (redundancies) and internal/external mistakes will be lowered. Thus it is expected to raise quantity and quality of communication and information through BPR with a positive association on the quality of information processing and customer collaboration.

HYPOTHESIS H₇

BPR with its impact on (external) information quality is positively related to an improved customer collaboration.

3.4 Job Satisfaction

This paper also builds on IT performance effects as tacit, socially complex and firm specific resources. It is assumed that IT performance and process definitions support internal service quality which therefore drives employee satisfaction. This satisfaction therefore, drives employee loyalty (knowledge keeper) and productivity as staff is more satisfied with the content of its work and

its work environment (GÖBL, 2003; SCOTT ET AL., 2011).

Due to the high share of standardized tasks for LSP employees, effects lead to relatively low-skill requirements in LSP work force. Niche LSP show a high degree on non-standardized projects and flexibility. Employees working in this service field are supposed to attract a higher degree of acceptance and pro activity in terms of innovation management. Based on this background and in conjunction to chapter 3.1.1 its longer stated that organizational/IT-structure will influence the behavior of employees (DALTON ET AL., 1980). Internal advantages of raising the degree of reliable planning and service related considerations, impacts on absenteeism and moral of employees (social cost element) can be noted (BOURLAKIS & MELEWAR, 2011).

Thus, these employees provide a greater level of external service value, driving a higher level of external customer satisfaction and therefore build customer loyalty. Based on such developments companies can achieve greater revenues and profitability (HESKETT & SASSER, 2010).

HYPOTHESIS H₄

BPR with its impact on job satisfaction is correlated to IT service performance.

3.5 Quality of order processing: IT performance

A functional organization normally takes “ownership” of customer data. Shifting to a process driven organization establishes the management to increase a information share. Beside procedural efficiency, process completeness is the key to serve customers (PICCOLI ET AL., 2009). Researches describe consistently improved performance for such B2B LSP as being “market orientated” (ELLINGER ET AL., 2010, p. 79).

A majority of empirical surveys reported a positive relationship of IT-innovation and performance (PRAJOGO & OLHAGER, 2011). In terms of this business case complex customer requests need to generate a solution at the first point of contact. An IT service platform will integrate all processes within and across applications which are necessary to fulfill the customer need. Due to growing customer expectations for seamless, often real-time, cross departmental integration of process workflows, IT integration creates procedural efficiencies for the customer and enables the customer to demand multi-dimensional requests (different products) with only one touch point at the LSP. Here BPR is supposed to significantly raise the integration level and the related performance.

HYPOTHESIS H₅

BPR with its impact on IT service performance is positively related to a competitive value proposition.

3.6 Improving customer collaboration (relationship)

Due to IT developments customers and LSP lost their intimate personal contact relationships. Cost and optimization pressure in projects affect the collaboration of partners. Here collaboration effort may significantly impact the performance outcomes of each party (TAN ET AL., 2010). HAZEN (2012, p. 17) consider relationship via eight key dimensions: Communication and information sharing, cooperation, trust, commitment, relationship value, power imbalance and interdependence, adaption and conflict. The first is considered in terms of this work. Here strategic information flows foster product quality and lower total costs (RAI ET AL., 2009). Therefore firms must focus on delivering the highest value through better communication.

Databases and personalized IT interactions (EDI) can support such major demands. Internet solutions offer a trend to greater customer empowerment. EDI automatically translates customer desires with improved trading partner communication and leads to data accuracy (HAZEN, 2012).

Besides this, advanced customer data companies may be empowered to identify profitability.

Based on academical research customers seek relationships (e.g. PARASURAMAN ET AL., 1991) as ongoing personalized contacts. In general customers want a partner who knows their issues and cares about them. Process intensive relationships therefore rely on personalized communication. IT support attributes are expected to attribute positively to such efforts.

HYPOTHESIS H₈

BPR with its impact customer collaboration is positively related to a competitive value proposition.

4. METHODOLOGY – RESEARCH METHOD

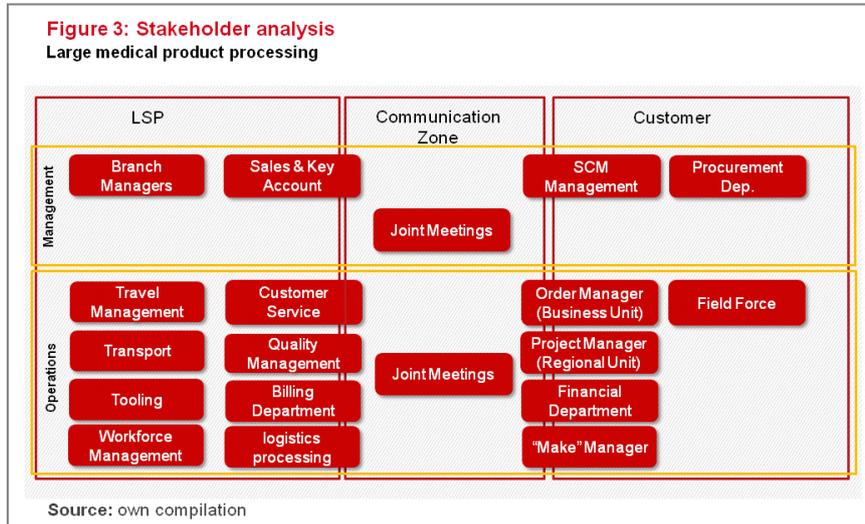
The aim of the study was to investigate the tacit influence of IT accented BPR with the focus on developing a competitive value proposition. The survey seeks to confirm a positive relationship between incremental BPR and IT-innovations and intangible factors supporting a value preposition. In the context of this business partnership the relationship factor shall be addressed. Due to the given involvement in the BPR of the authors besides the specialist interviews a quantitative research is used. Qualitative methods provide a more detailed depth and richness (ELLRAM, 1996) and are useful in early stages of concept developments (SACHAN & DATTA, 2005). The information from literature review and internal process experiences were used to select accepted items to the various dimension.

4.1 Data collection

Because of the focus on collaborative relationships in SCOs two different mail surveys were used:

One to measure LSP items of the collaboration process, another targeting the customer (OEM) side (cf. FIGURE 3).

The mail survey was designed through a web-based program offering the opportunity to monitor the survey. As most collaboration is based on a customer service process participating stakeholders of this process are parallel addressed. FIGURE 3 hereby expresses the collaboration zone.



4.1.1 Respondents’ reply on LSP side

On LSP side mostly customer service employees, as well as process owners and team leaders dealing with in-plant logistics and commercial handling were addressed. All participating persons own customer linked processes. The final pool consisted of 49 persons. By the end of the execution week 83.7 per cent of the sent our surveys were received. Respondents reflect the sample being studied which limits the potential for selection bias (MENTZNER & FLINT, 1997).

The high rate of directly involved informants reported high levels of knowledge minimizing the concerns of false reporting bias.

Representing the knowledge on the process 20 persons work more than five years for the LSP, nine informants between two to five years and eleven up to two years with an arithmetic average of 7.1 years. Due to the high range of answers (1 to 22 years) the average quartile calculated is 5.43 years. Many informants showed a short belongingness to the process, but stated all direct involvement in the process.

There were in total no significant differences in item responses reducing the concern for nonresponse bias as a thread of internal validity. However informants in leading positions slightly tend to answer more critically.

4.1.2 Respondents’ reply extern (Customer)

On the customer side the selection targeted persons involved in a customer process (SC managers, order and project managers). Respondents reflect the sample being studied which again limits the potential for selection bias (MENTZNER & FLINT, 1997).

There were in total no significant differences in item responses reducing the concern for nonresponse bias as a thread of internal validity.

Representing the knowledge on the process 40 per cent of the people work more than ten years in the partnership with the LSP, another 40 per cent informants between four to ten years and only 20 per cent between two and four years. None stated less than two years with an arithmetic average of 7.9 years. Due to the wide range of answers (1 to 20 years) the average quartile calculated is 6.95 years. In comparison to LSP, informants showed a longer knowledge in the process (retention period) which limits the potential of reporting false bias.

However, informants of the project management organization slightly tend to answer more positive on “Communication/ Information” and “Flexibility/ Responsiveness” items.

4.2 Complex of questions

In order to verify knowledge on the current information management process and to evaluate the latent construct variables the hypotheses are transformed into items. Fundamental variables targeting those latent constructs are formulated as “indicators” (BACKHAUS ET AL., 2011).

4.2.1 LSP questionnaire

To verify the internal validity of answers, indicators of dimensions were mixed within such groups. Hereby every question was mirrored with at least one control question.

Clear items regarding each latent variable have been grouped on given expert (LSP intern) and customer

interviews (cf. APPENDIX A) and clustered to the named hypothesized dimensions “Process Stability”, “Communication/ Information”, “Job Satisfaction”, “Flexibility/ Responsiveness” and “Performance” (of IT service; cf. FIGURE 2). In total 57 items were asked.

4.2.2 Customer (OEM) questionnaire

On customer the side the questionnaire contained 39 items (cf. APPENDIX B). In addition 14 items were compiled through the formulation of global statements focusing the dimension of collaboration and competitive value (in total 39 items). In order to verify the internal validity of answers, indicators were mixed within such groups. Hereby every question was mirrored with at least one control question.

4.3 Measurement

Constructs were measured using a six-point scale Likert-type scale from 1 (strongly disagree) to 6 (strongly agree) plus the possibility to cross “no information” which is accepted practise for this kind of research (LAI ET AL., 2008, WITTMANN ET AL., 2009) and were also used in prior studies bordering this study, e.g. on technological innovation (RICHEY ET AL., 2009), flexibility and collaboration. Original construct names were retained in order to avoid an influence on informants.

4.4 Data analysis

Structural equation modeling was used to test the hypothesized relationship among constructs (Partial least squares, abbr. PLS; RINGLE ET AL., 2005). PLS is a valid alternative to structure covariance models and structure models that use maximum likelihood (ML) estimation and is increasingly used in business literature (GOLICIC ET AL., 2012). PLS was specifically used due to a low sample size below a recommended minimum for ML estimation. PLS is prediction orientated and attempts to explain variance in newer theories.

Since this method is beginning to gain more attention in the logistics literature, this research also illustrates theoretical models for logistics research. PLS can produce greater levels of statistical power for low sample sizes (WOLD, 1980; JAHN, 2007) and should be preferred in comparison to other methods (like LISREL i.e. AMOS, EQS, etc.). As ML methods target causality, PLS is prediction orientated and tries to attempt newer theories (WEIBER & MÜHLHAUS, 2010). Here the PLS approach shows advantages as the approach of consistency in PLS is often more beneficial than the aim to optimize covariance analyses in a not exact environment (WOLD, 1980).

In order to use the causality approach of the SmartPLS software the internal and external success factors were splitted (due to different sample rates) by modeling two result models. Based on the structural equation model (cf. FIGURE 2) two measurement models were created (cf. FIGURE 5/6) in order to bring empirical indicators

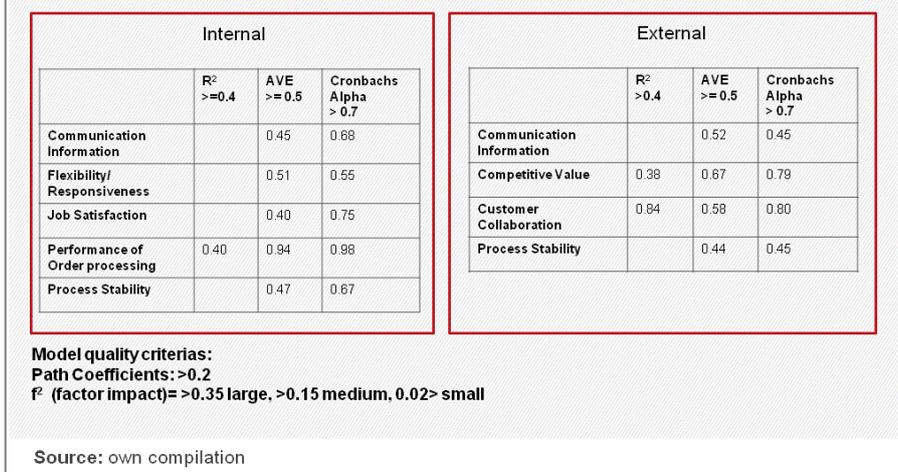
(i.e. exogenous variables) in relation to latent (endogenous) variables.

4.4.1 Validity and reliability

Before testing the hypothesized structural model, reliability and validity of the items were evaluated by measuring the first-order latent constructs in their correlation (used indicators were tested in their one-dimensionality; JAHN, 2007). Reliability was accessed by item and construct reliability (PETER, 1981). In general indicators showed a formative (not reflective) characteristic by not being influenced through the construct. Indicators are highly bounded to the construct and mostly correlate positively (internal consistency). Validity factors were proven based on HOMBURG & GIERING (1996) in criterias of nomologically and content, convergence (correlation of items in one dimension) and discriminance (loadings between items of different dimensions are lower than within one dimension). In order to measure quality criteria questions with positive and negative intention needed to be aligned before using them in SmartPLS. All quality criteria for PLS covering reliability are shown in FIGURE 4.

Due to the high demanded correlation, indicators (within latent variables = dimension) show a high degree of replaceability. This means the elimination of one item hardly changes the constructs result. Although the internal quality indicators showed the possibility to lower indicators for the following measurement models “content validity” was put forward in comparison to internal consistency of dimensions. In addition (CHIN 1995) stated for PLS approaches the necessity of many indicators due to the risk of overestimation with a low number.

Figure 4: Quality Criteria for PLS



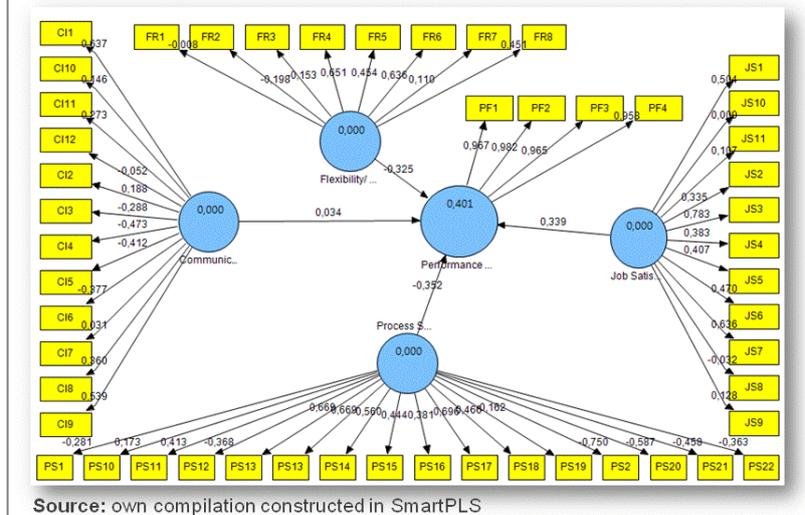
4.4.2 Measurement model – Internal view

The internal construct is based on five latent variables being connected to grouped question items (indicators; cf. FIGURE 5). Answers of filtered questions addressing mid-managers and executives in managerial

(controlling) function were directly connected to the performance indicator (PF1 – PF4) (cf. APPENDIX A/B) as it was assumed that such persons directly influence service performance.

Figure 5: SmartPLS Construct Design

Internal Questionnaire (LSP)



A general review of the model shows that path coefficients result in strengths above >0.2 (following Ringle, 2004) only the latent construct Communication/ Information (H4) is significant below. Indicator loadings (f²) beside JS10 & FR1 described their relevance for the latent variables (> 0.02) and therefore support the intended Hypotheses.

Process Stability (H1), Flexibility/ Responsiveness (H2) and Job Satisfaction (H4) show clear impact strengths far beyond the demanded 0.15 (Chin, 1998; Ringle, 2004) while Communication/ Information (H3) gives insignificant values.

All grouped indicators show a clear communality index beyond 0.4 stating the possibility to influence the latent variables (despite JS10 & FR1). Focusing the formulated Hypothesis latent variables will be described.

Process Stability (H1)

H1 shows a strong path coefficient (0.35). Major IT impact areas are improvements in the definition of responsibilities (PS2; 0.75), prioritization of work (PS17; 0.69) or the standardization of processes (PS13; 0.67). Indicators on internal structures, competencies and

interfaces show more impact, than the complexity or volume of work.

As proposed by H1 BPR and structural changes have positive effects on the IT service performance by focusing on clear internal role definitions along the customer process.

Flexibility/ Responsiveness (H2)

H2 leads into reasonable path coefficient similar to H1 (0.33). IT innovations need to address the major process characteristics of direct arrangements (FR4; 0.65), dynamic (FR6; 0.64) and cumbersome (FR8; 0.451) while flexibility (FR1) and the possibility for changes on short notice (FR7; responsiveness) shouldn't be changed.

As proposed by H2 IT innovations in the BPR-P brings positive effects on the IT service performance by focusing on the abilities of supporting dynamic, direct arrangements but also changes in a felt cumbersome process.

Communication/ Information (H3)

H3 results into a low path coefficient (0.03). After reviewing items two major groups can be clustered: LSP internal orientated communication offering major impact, while customer orientated flows show low indicator loadings. In total both dimensions equalize the total path coefficient. Missing external communication potentials might be interpreted as the high impact of indirect, flexible and informal communication is internally seen positively whereas respondents in managerial positions show different opinions. Statements in such dimension might be influenced by tensions later being explained as limitations.

As proposed by H3 IT innovations in the BPR-P bring hardly no effects on the IT service performance by focusing internal communication and the visualization of informal and dynamic communication to the customer.

Job Satisfaction (H4)

H4 shows a strong path coefficient (0.34). Respondents give a clear positive picture of their current situation regarding their workplace (JS7), tasks (JS3) and working atmosphere (JS8). Even the attitude towards change is highly developed. On the other hand impacts on tasks beyond own work definition and jointly working show areas of future improvements. In order to keep given major loadings and to support depauperate ones, IT in the BPR-P should focus (in linkage to Process Stability) clear role definitions.

As proposed by H4 IT innovations in the BPR-P encounter positive effects on the performance of IT service performance by focusing on interfaces and clear responsibilities to support a joint working atmosphere.

Performance of IT performance (H5)

This latent variable is linked to indicators addressed to respondents with managerial functions. Here the capabilities of monitoring performance are unveiled. All indicators show a loading beyond 0.95 and visualize the gap in IT functions enabling process owner to monitor their processes. This dimension describes one major drawback of the current situation. Due to the close linkage to the latent variable of Competitive Value (cf. FIGURE 3) it also describes a major thread impacting the vitality of the company.

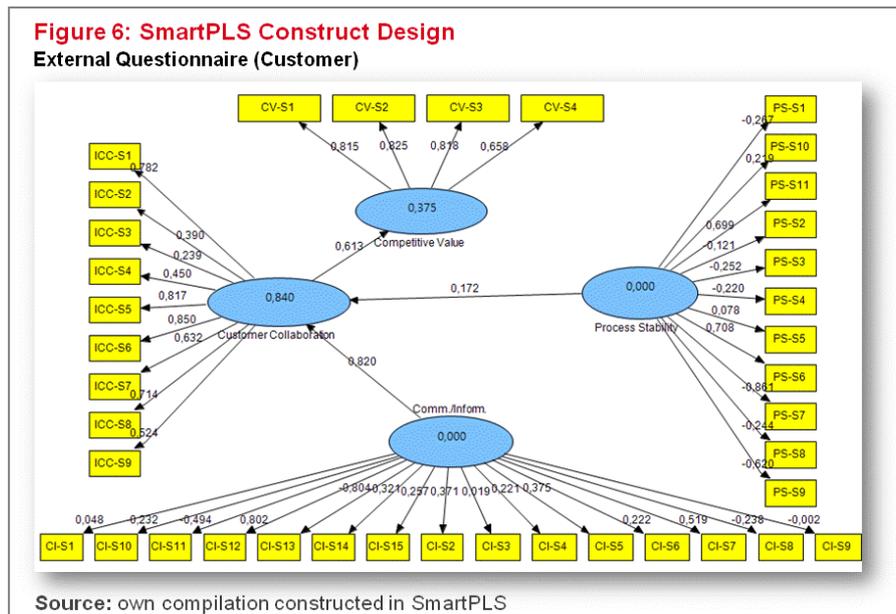
The final global validity of the model is mirrored in the R Square ($R^2 = 0.4$). It shows the exact demanded minimum value by literature (e.g. CHIN, 1998) and therefore supports the assumption of acting as endogenous variable towards the value proposition for LSP.

In order to come to a global explanatory power a final Goodness-of-Fit-Index (abbr. GoF) following TENENHAUS ET AL. (2005) can be calculated:

$$GoF_{LSP} = \sqrt{\text{average communality} \times \text{average } R^2} = \sqrt{0.61 \times \frac{0.401}{2}} = 0.49$$

1.00 hereby states an ideal fit. The index range associated with a model that fits is wide. With the background of the complexity of the model (indicators & latent variables) and an adjusted freedom factor, the value can be assessed as meaningful authentication of the model (TENENHAUS ET AL.; 2005), but could be better as the gap to one is quite large.

With the knowledge in internal IT innovation capabilities, results from a customer perspective are mirrored.



4.4.3 Structural model – External view

The external construct is based on four latent variables being connected to different indicators (cf. FIGURE 6). With a difference to the internal construct several answers were grouped to the latent variable Competitive Value (CV-S1 – CV-S4) such indicators state the perceived value preposition of the LSP.

As influencing factor to Competitive Value the latent variable Customer Collaboration (H8 ; CV-S1 – CV-S4) targets nine direct indicators on relationship and collaboration while Process Stability (H6 ; PS-S1 – PS-S11) and Communication/ Information (H7 ; CI-S1 – CV-S15) indirectly influence Customer Collaboration. A general review of the model (cf. FIGURE 6) shows that path coefficients for Communication/ Information (H7) shows high values, while Process Stability (H6) slightly underrun suggested minimum values.

Customer Collaboration therefore gives clear loading for the Competitive Value impact. Indicator loadings (f2) besides CI-S3 & CI-S9 described their relevance for the latent variables (> 0.02) and therefore support the intended Hypotheses. All grouped indicators show a clear communality index beyond 0.5 stating the possibility to influence the latent variables (despite CI-S3 & CI-S9). Focusing on the formulated hypothesis latent variables will be described

Process Stability (H6)

H6 leads to a low path coefficient (0.172) in comparison to the internal result and ranks short under recommended values. Major loadings concentrate on potentials of individual mistakes (PS-S11) and chaotic (PS-S6), low standardized (PS-S7) and low efficient (PS-S9) processes. Indicators with current minor impact like informal arrangements, changes at short notice are hard to coordinate (adjective) and document the biased view as the LSP is copying with such process attitudes of customers.

As proposed by H6 improved IT systems in the BPR-P encounter slight positive effects on the improvement of process stability and slightly positively affect customer collaboration due to the fact that customers value the current state of individual (not standardized) and direct communication.

Communication/ Information (H7)

H7 shows a very strong path coefficient (0.82). Respondents give a clear positive picture of the current process challenges regarding the high impact of complexity (CI-S12), dynamic (CI-S7) and missing information (CI-S13). Whereas direct arrangements (CI-S1), individual communication (CI-S3) or cumbersome (process adjective; CI-S9) are stated with low impact. In the maturity of the process customers can choose the way of communication towards LSP causing unstandardization without interferences.

In order to keep given major loadings and to support depauperate ones, IT in the BPR-P should focus on the support of flexible and unstandardized communication by uniform handling of complexity and dynamic.

As proposed by H7 IT innovations in the BPR-P encounter positive effects on the improvement communication and information and affect positively customer collaboration. In contrary to internal results customers evaluate non standardized communication higher than employees of the LSP.

Improving customer collaboration (H8)

H8 combines path coefficients of H7 and H6 including loadings of nine indicators leading to a high path strengths of 0.61 towards competitive value. Beside the major impact of H7 and a low influence of H6 improvements in customer collaboration are based on joint data management regarding the utilization of feedback (ICC-S5), data integration for lean processes (ICC-S7) or efficiency in data management (ICC-S6). In general all indicators show a high impact whereas the

item “joint KPIs with LSP” is way below average and might show the missing interest of the customer in creating such bilateral goals. In total IT innovations targeting indicators of H8 will gain high potentials for perceived improvements and come affectively close to the interface with the customer.

As proposed by H8 IT innovations in the BPR-P encounter high effects on the improvement of customer collaboration and impact the extension of a competitive value.

In order to ask a global statement on the performance of the LSP with its customer four indicators directly addressed the competitive value asking in the trust of processes (0.81), innovation efforts (0.82), potentials for future challenges (0.82) and a unique selling proposition (0.66). Loadings of items indicate that informants rate trust and efforts for the future partnership as key factors while current market position is still high but less evaluated. Therefore IT improved systems in BPR-B should consider and mirror such customer perceptions and support trust (relationship) building techniques.

The final global validity of the model is mirrored in the R Square (R²) of the latent variable Competitive Value (0.38). It slightly underruns the demanded value by literature. The final GoF results into:

The value expresses a significant figure due to the complexity of the model (in conjunction to GoF of chapter 3.2.3.1).

4.5 Results

The holistic perspective of BPR applied here took both dimensions innovation management and process design with its impact on persons and structure into account. It covers its impact on a service relationship. In general it proved to be effective to clearly distinguish categories. To finalize the explanatory power both structural models are merged with their results (GoF) into one final statement:

$$GoF_{total} = \frac{GoF_{LSP} + GoF_{OEM}}{2} = \frac{0.49 + 0.57}{2} = 0.53$$

Both figures mirror a closeness of the total model and show the dependencies of the process. Therefore chapter 4.5.1 illustrates the main border-wide effects of the model.

This survey tried to explore different views on IT expectations in the BPR Process – both with the aim of the LSP to improve its competitive value. By reviewing chapter 4.4.2 & 4.4.3 differences in the impact of dimension came true. Whereas internally Process Stability is seen with high path coefficients external results neglect its potential. In contrast, Communication and Information hide external huge influence compared to low internal potentials. Here the expectations of proactive LSP communication with certain characteristics of standardization, flexibility and

efficiency come obvious. While the LSP bears the danger to concentrate on internal problems in order to cope with the flexible demand (and raising complexity) the customer continuously expects higher communication solutions. Especially new forms of feedback communication from service points (at the end customer) bear value added information.

5. CONCLUSION

This paper contributes to the literature on business value of IT as well as on the value of BPR implementations. Based on the preceding quotation the need for service orientation in logistics activities is one central demand. Logistics service innovation is a critical pay-off factor in the aim to obtain competitive. In order to investigate the impact a wide variety of measures were considered. What emerged from the data were individual meanings and interpretations based on one specific project within the LSP and participating on a specific SCO. Here IT-based integrated systems are immensely more flexible than manual systems. In addition they provide vastly more information which creates the ability to self-serve. In total it is expected to associate positively on the value proposition by targeting internal procedures (communication, structure and flexibility) and therefore job satisfaction. The latter should be treated carefully with the knowledge of employees who appreciate their job flexibility – as the customer does as well.

5.1 Results – Discussion & Implication

This practical business case helps to understand strategic decision gaps for LSPs and thus makes several small contributions to logistics research. For theory research finds, BPR as accepted tool to adjust information quality and quantity needs and to drive informational advantage. Prior studies show that the management of information is vital for logistics services. Thus, data provided shows principal influences of IT in BPR: Firstly an effect on process stabilization correlated with the ability to stay flexible, secondly the ability to control customer processes effectively and in-time (proactive management), thirdly the indirect influence on job satisfaction and its indirect impact on motivation (for service openness). Last with a minor role communication might be improved through more standardization. On the other hand, usage of IT in this circumstance might also bear the loss of direct communication and therefore relationship. From a customer side respondents proved the big challenge for a major potential in IT through improving communication and information. This dimension again supports the academical research opinion as key driver for collaboration with direct impact on the value proposition. LSP therefore should focus on IT functions supporting such demands, while individual process

optimization efforts towards customers are less recognized.

Certain limitations to the study should be noted. In the stage of the survey wave the LSP found itself in an already initiated BPR-P coping with the academical phenomenon of dropped performance (in terms of quality and financial figures; cf. ALTINKEMER ET AL., 2011). Thus, the data weighted heavily of the current status of the project and is specific. Making data in a common IT architecture available to others can be seen as a loss of power (CHEN & POPVICH, 2003). The share of information requires a paradigm shift in the culture (RICHEY & AUTRY, 2009).

BPR and its radical changes confront organizational member with a high involvement (TIETMEYER, 2009). In addition involved employees might feel the lose of knowledge on existing processes (often personalized knowledge) and expect their "unique employee position" as no more relevant (TIETMEYER, 2009).

On customer side changes are skeptically followed with the concerns on quality and service performance.

Due to the usage of the PLS approach the study is characterized with an exploratory meaning, giving advice for future researches. Hereby a small sample rate lowers the prediction relevance. "In addition validity can never be proved stable, but being supported" (BOLLEN, 1989, p. 185).

5.2 Recommendations – Limitations – Further research

The role of LSP regarding their proactivity in innovations has long been discussed. Already nine years ago KNEYMEYER & MURPHY (2005) concluded LSP performance on innovation as a matter of the perspective (user/provider). Findings in papers on proactive innovations suggest that SCO change (e.g. through BPR) needs to be seen more broadly than the traditional top-down or bottom-up approach. In SC practice, change requires the involvement of external SC members. Especially the customer relationship process (stability of relations) a key success driver in a period of consolidations (EXCELLENCE BAROMETER (EXBA), 2008) and needs to be focused.

Managers often described negative emotions towards BPR. To manage social resistance from those individuals within and across Bus, firms must recognize those opinions.

Logistic service elements have their roots in marketing techniques. Firms need to implement logistic service customer strategies. With the shift of benefits changing from LSP competition to long term relationships in order to lower TCO, LSPs are enhanced to strategically contribute to firms operations. A further research might combine BPR (innovation) efforts with marketing techniques in order to visualize the impact on brand building and awareness.

Further research should focus different branches (OEM sectors) with an higher sample size.

5.3 Managerial implications

The attention for logistics in terms of a competitive advantage achievements is still low (GOURDIN, 2006; GÖBL / FROSCHMAYER, 2011; EVANGELISTA, 2012) although LSPs invest significant financial resources in information management. However, as it was indicated in the beginning of this paper, continuous improvement activities by LSPs leave much to be desired (LANGLEY, 2010; WUYI ET AL., 2010). In contradiction those companies are struggling with brand building and differentiation in the highly competitive market (GOLICIC ET AL., 2012). There are several best practise cases showing the transformation of LSP through their electronic information infrastructure to well known business logistics; e.g. FedEx used it's information to transform to an integrated set of business solutions. LSP need to continuously undergo critical reflections of their information capabilities. DEEPEN ET AL. (2008) approved hereby that those efforts increase performance of relationships and customer loyalty. As a major change effort, objects and disagreements in the process of reengineering can only be solved by personal intervention of the top management. The ability to change for every individual is highly claimed. Here change in terms of emotions is mostly associated negatively and relating to the expected role in a future is-to-be organizational structure. Especially the role of managers' commitment to support the transition of changes is not just a function of the change itself or how it is managed, but rather a far more complex calculus that includes aspects of the setting surrounding the change, individual differences, and the interactions (HEROLD ET AL., 2007). Branch managers are simply questioning what the change will bring to them. In many cases they (branch or supply managers) do not want to hold what they have (OMAR ET AL., 2012). Due to the fact that pre-BPR levels are in average reached within "four months" (ALTINKEMER ET AL., 2011, p. 152) management needs to support the drop of productivity. Even IT investments have the most effect after a lag of about two to three years (BRYNJOLFSSON & HITT, 2003) - a reason why studies often found little evidence. Especially ROI driven enterprises-wide implementations tend to assess their activities impatiently. THE META GROUP REPORT (1998) concluded that investing in IT technology without a customer oriented cultural mindset is like throwing money into a black hole. HAZEN (2012) also warns against starting an IT project if top management does not fundamentally believe in re-engineering a customer-centric business model.

BPR requires a vision. Each employee must understand the purpose that changing processes will bring (LEWIN, 1958). The management needs to show this commitment and take the fear on job changes.

Last but not least, BPR should focus collaborating processes. Here ZACHARIA ET AL. (2011) described

the chances for LSP to emerge as orchestrator. IT and information sharing can foster relationship building. Mutual trust in addition is a major driver for IT customization (according to KLEIN ET AL., 2007) and greater strategic flows. Relationship building therefore is supposed to have the overlapping function of all discussed topics in this paper.

The LSP market is highly competitive these days. In order to face such challenges managers should note the crucial outer opinion formulated by JOM TOMPKINS (CEO TOMPKINS INTERN.), "Customer satisfaction can turn on a dime, whether you're talking about a meal you just had in a restaurant or a logistics service provider's (LSP's) relationship with its clients."

6. ABOUT THE AUTHORS

Prof. Dr. Martin Göbl has been lecturing in logistics and business management at the University of Applied Sciences in Kempten, Germany since 2006.

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Appendix A: Internal (LSP) view

Dimension	Item	Dimension Indicator No. (57)	Validation	1 does strongly not apply	2 does not apply	3 does rather not apply	4 does rather apply	5 does apply	6 does strongly apply	Sum
Process Stability 22										
4A	Overlappings in Structure	PS1	4C	0%	5%	23%	38%	21%	13%	100%
4C	Responsibilities	PS2	4A	0%	28%	13%	28%	15%	18%	100%
B	cross-linkings, connections	PS3	5A	0%	5%	13%	36%	18%	28%	100%
5C	inter-firm interest	PS4	11F	3%	8%	8%	18%	33%	33%	100%
5D	competencies	PS5	5C	0%	5%	31%	31%	28%	5%	100%
7B	Competencies	PS6	8D	5%	8%	15%	35%	35%	3%	100%
7D	Freedom of action for ideas	PS7	10A	0%	5%	16%	24%	39%	16%	100%
8C	Definition of Tasks	PS8	7A	0%	3%	15%	30%	38%	15%	100%
8D	Knowledge on Stakeholder for Problems	PS9	7B	0%	0%	3%	8%	53%	37%	100%
10B	Missing description of interfaces	PS10	4C	3%	5%	13%	30%	40%	10%	100%
11B	transparent	PS11	15C	0%	8%	33%	45%	15%	0%	100%
11C	chaotic	PS12	15D	5%	16%	26%	32%	16%	5%	100%
11G	standardized	PS13	9C	8%	22%	27%	32%	11%	0%	100%
11K	uniformly	PS14	10A (rev.)	5%	11%	55%	11%	18%	0%	100%
11L	efficient	PS15	11J (rev.)	3%	8%	49%	27%	11%	3%	100%
13A	Safety in work processes	PS16	13D	3%	0%	5%	20%	60%	13%	100%
13C	Priorization of work	PS17	13C	0%	0%	8%	10%	58%	25%	100%
13D	Overview over work	PS18	6D	3%	5%	18%	10%	35%	30%	100%
15C	complex	PS19	11B	0%	3%	10%	28%	49%	10%	100%
15D	hard to coordinate	PS20	11C	0%	18%	36%	28%	15%	3%	100%
17D	individual mistakes	PS21	n/a	0%	16%	21%	45%	18%	0%	100%
17E	others...	PS22	n/a	6%	6%	29%	59%	0%	0%	100%
Flexibility/ Responsiveness 8										
4B	Flexibility	FR1	11A	3%	15%	25%	18%	35%	5%	100%
9B	Changes of plannings on short notice	FR2	11H	0%	0%	15%	25%	38%	23%	100%
9C	Informal arrangements	FR3	10A	0%	11%	26%	26%	14%	23%	100%
10A	Direct arrangements	FR4	9C	3%	0%	0%	35%	53%	10%	100%
10A	flexibel	FR5	4B	3%	3%	14%	49%	32%	0%	100%
10H	dynamic	FR6	9B	6%	3%	34%	31%	26%	0%	100%
10I	up to date	FR7	15A	5%	5%	32%	37%	21%	0%	100%
10J	cumbersome	FR8	10C	3%	11%	21%	32%	29%	5%	100%
Job Satisfaction 11										
4D	Satisfaction	JS1	5A	0%	13%	33%	15%	25%	15%	100%
5A	Satisfaction	JS2	4A	5%	13%	28%	23%	33%	0%	100%
6A	Satisfaction with Tasks	JS3	6C	0%	3%	8%	5%	50%	35%	100%
6B	Attitude towards Change	JS4	7C	3%	8%	5%	10%	25%	50%	100%
6C	Work atmosphere	JS5	7C	10%	3%	20%	23%	33%	13%	100%
6D	Overview of own work	JS6	13D	0%	5%	13%	13%	35%	35%	100%
7A	Definition of work	JS7	8C	3%	5%	8%	13%	43%	30%	100%
7C	Change of atmosphere in BPR	JS8	6C	10%	8%	20%	33%	20%	10%	100%
8A	Beyond Tasks	JS9	7A	0%	13%	40%	33%	13%	3%	100%
11D	innovative	JS10	13B	0%	20%	26%	40%	14%	0%	100%
11F	jointly	JS11	5C	3%	8%	13%	46%	31%	0%	100%
Communication/ Information 12										
8B	Proactivity in Communication	C11	13D	3%	10%	28%	33%	20%	8%	100%
9A	Data in time	C12	15A	0%	11%	24%	26%	37%	3%	100%
9D	Collaboration in Simon Hegele	C13	5C	3%	3%	18%	30%	43%	5%	100%
10C	Customer communication	C14	13B	5%	5%	18%	37%	34%	0%	100%
10D	external coordination	C15	10E	3%	3%	14%	30%	38%	14%	100%
10E	internal coordination	C16	10D	8%	22%	43%	22%	5%	0%	100%
13B	customer communication	C17	10C	0%	8%	5%	35%	32%	19%	100%
15A	on time	C18	9A	0%	8%	18%	36%	38%	0%	100%
15B	complete	C19	17B	0%	5%	36%	33%	26%	0%	100%
17A	internal mistakes	C110	10E	0%	11%	16%	29%	45%	0%	100%
17B	internal missing information	C111	15B	0%	5%	5%	45%	45%	0%	100%
17C	internal customer information	C112	10D	0%	8%	42%	37%	13%	0%	100%
Performance 4										
16A	Controll of customer guidelines	PF1	PF1	0%	18%	27%	45%	9%	0%	100%
16B	KPIs	PF2	PF2	9%	27%	36%	0%	18%	9%	100%
16C	Steering of processes	PF3	PF3	9%	27%	18%	27%	9%	9%	100%
16D	real time monitoring	PF4	PF4	45%	9%	27%	9%	9%	0%	100%

Appendix A: External (customer) view

Question No.	= internal Questionnaire	Item	Dimension Indicator No. (39)	Validation	does strongly not apply	does not apply	does rather not apply	does rather apply	does apply	does strongly apply	Sum
					1	2	3	4	5	6	
Process Stability											
					11						
1B	n/a	Definition of interfaces	PS-S1	1D	0%	7%	0%	0%	60%	33%	100%
1D	n/a	reasonable integration	PS-S2	1B	0%	0%	7%	0%	57%	36%	100%
1E	9C	Informal arrangements	PS-S3	1A	0%	0%	15%	0%	23%	62%	100%
1F	9B	Changes of plannings on short notice	PS-S4	1F	0%	23%	15%	0%	46%	15%	100%
2B	11B	transparent	PS-S5	3C	0%	9%	55%	0%	36%	0%	100%
2C	11C	chaotic	PS-S6	3D	17%	33%	8%	0%	33%	8%	100%
2F	11F	standardized	PS-S7	3C	0%	15%	15%	0%	69%	0%	100%
2J	11J	uniformly	PS-S8	1G (rev.)	8%	17%	42%	0%	33%	0%	100%
2K	11K	efficient	PS-S9	2I	9%	9%	18%	0%	64%	0%	100%
3D	15D	hard to coordinate	PS-S10	2B	0%	17%	33%	0%	50%	0%	100%
4E	17E	individual mistakes	PS-S11	n/a	0%	0%	18%	0%	55%	27%	100%
Communication/ Information											
					15						
1A	10A	Direct arrangements	CI-S1	1E	0%	7%	0%	0%	87%	7%	100%
1C	5C	Different interest	CI-S2	2E	0%	8%	31%	0%	46%	15%	100%
1G	n/a	Individual related communication	CI-S3	1E	0%	7%	0%	0%	67%	27%	100%
2A	11A	flexible	CI-S4	2A	0%	0%	14%	0%	64%	21%	100%
2D	11D	innovative	CI-S5	12C	9%	27%	27%	0%	36%	0%	100%
2E	11E	jointly	CI-S6	1C	17%	0%	8%	0%	75%	0%	100%
2G	11G	dynamic	CI-S7	1F	7%	21%	0%	0%	71%	0%	100%
2H	11H	up to date	CI-S8	3A	9%	18%	27%	0%	36%	9%	100%
2I	11I	cumbersome	CI-S9	2K	8%	23%	15%	0%	46%	8%	100%
3A	15A	on time	CI-S10	2H	0%	17%	25%	0%	58%	0%	100%
3B	15B	complete	CI-S11	4D	0%	18%	36%	0%	45%	0%	100%
3C	15C	complex	CI-S12	2F	0%	27%	27%	0%	45%	0%	100%
4B	17A	Missing internal communication	CI-S13	3D	0%	23%	15%	0%	46%	15%	100%
4C	17C	Missing customer communication	CI-S14	4B	0%	36%	7%	0%	57%	0%	100%
4D	n/a	Missing Information connection to SH	CI-S15	3B	0%	9%	27%	0%	55%	9%	100%
Improving Customer Collaboration											
					9						
10A	16C	Steering of processes	ICC-S1	10B	0%	17%	25%	0%	50%	8%	100%
10B	16D	real time monitoring	ICC-S2	10A	10%	30%	30%	0%	20%	10%	100%
10C	16B	KPIs with LSP	ICC-S3	11B	13%	13%	75%	0%	0%	0%	100%
10D	n/a	Quality Processes at End Customer	ICC-S4	11A	9%	27%	18%	0%	27%	18%	100%
11A	n/a	Utilization of Feedback	ICC-S5	10D	18%	18%	18%	36%	9%	100%	
11B	n/a	Efficiency of data management	ICC-S6	2K	0%	44%	11%	33%	11%	100%	
11C	n/a	data integration for lean processes	ICC-S7	4C	0%	13%	38%	38%	13%	100%	
11D	n/a	Consideration of logistic demand in R&D	ICC-S8	n/a	0%	20%	40%	40%	0%	100%	
12B	n/a	LSP partnership	ICC-S9	2E	0%	8%	0%	0%	75%	17%	100%
Competitive Value											
					4						
13A	n/a	Trust in outsourced processes	CV-S1	n/a	0%	0%	18%	0%	82%	0%	100%
13C	n/a	Innovation efforts of LSP	CV-S2	2D	0%	11%	22%	0%	56%	11%	100%
13D	n/a	LSP Potential for future demands	CV-S3	n/a	0%	0%	30%	0%	60%	10%	100%
13E	n/a	LSP has unique selling proposition	CV-S4	n/a	0%	0%	44%	0%	56%	0%	100%