

# Orientation Towards IC-Technologies and Value Added Services at Logistics Service Providers

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**Abstract** Value added services in combination with the utilization of innovative information and communication-technologies are a valuable source for differentiation of logistics service providers. To examine the orientation of logistics companies towards these aspects and to analyze their usage of formalized processes for the development of new services, a study among the German logistics industry was conducted. The study is based soundly in the theories of the Resource-based view, the Service-dominant logic and the concept of service engineering. With regard to the current market situation the main research results reveal a controversy: On the one hand, logistics service providers have realized the potential of both information and communication-technologies and value added services. On the other hand, they still lack formal development procedures. Closing this gap will be a challenging task for the management of the future.

## 1 Need for Value Added Services at Logistics Service Providers

The business environment for German logistics service providers (LSP) has become more competitive during the last decades (Klaus et al. 2011; Soinio et al. 2012; Wagner 2008; Wallenburg 2009) and shippers have become more demanding

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and request higher levels concerning quality and costs (Langley et al. 2005; Preiß and Weber 2012; Wilding and Juriado 2004). Furthermore, basic logistics services such as transportation and warehousing are perceived as exchangeable and the logistics market can be understood as a commodity market (Davis et al. 2008; Neubauer 2011). This leads to a further increase in competition as the price becomes the most important criterion for purchase decisions and innovations are quickly copied (Davis et al. 2008). In this sense, basic logistics services are standardized and substituted easily because customers are little loyal to a certain carrier (Christopher 2005; Wallenburg 2009). Facing these challenging circumstances, LSP are looking for resolutions to counteract this situation. One widely recognized option in literature is the differentiation through the offering of additional logistics services, so called value added services (VAS) (e.g. Christopher 2005; Liu and Lyons 2011; Wallenburg 2009).

VAS are defined as an enlargement of the basic logistics services which are offered to internal or external customers and which foster new revenue streams for the LSP (Berglund et al. 1999; Notteborn and Winkelmann 2001; Preiß and Weber 2012; Soinio et al. 2012). Next to revenue, they offer a couple of additional advantages: Increasing customer satisfaction, larger market shares and a higher customer loyalty (Grawe 2009; Busse 2010; Wagner and Busse 2008; Wallenburg 2009). There are different types of VAS and examples can be found at e.g. Grundey and Rimiene (2007) and van Hoek (2000). Especially the group of information- and communication (IC)-technology based VAS are promising concerning differentiation and revenue (Preiß and Weber 2012).

The need for differentiation and the positive impact of IC-technology based VAS are accepted both in theory and practice (e.g. Wallenburg 2009; Wong and Karia 2010). But how oriented are LSP towards IC-technologies and VAS and how does the status quo concerning the development of such innovative VAS look like? A comprehensive study among German LSP was conducted to answer this question. To present the findings, the remainder of this contribution is structured as follows: After the introduction, the theoretical background of the study is explained. In the third and fourth section, the applied research methodology and the achieved results are presented. The contribution ends with both theoretical and managerial implications as well as limitations concerning the research methodology.

## 2 Theoretical Background of the Conducted Study

In this section the theoretical background of the study is developed. For this case, three concepts are used: The Resource-based view of the firm and the Service-dominant logic as underlying theories and the principles of service engineering as guidelines for the successful development of services.

## ***2.1 Resource-Based View of the Firm and Service-Dominant Logic as Theoretical Fundamentals***

The first theoretical pillar associated with the underlying research is the Resource-based view of the firm (RBV). This theory is associated strongly with the concept of competitive advantage, which can be described as the distinction of a firm and its competitors from a customer's perspective which can be achieved through cost leadership, differentiation or focus (Porter 1985). The main target of the RBV is to create such a sustainable competitive advantage (Penrose 1959; Porter 1985; Wernerfelt 1984). The underlying ideas of the RBV can be ascribed to Penrose (1959), who already drew a strong linkage between a firm's resources and its profitability and growth. Following this understanding, the resources of a certain firm are the roots for sustained competitive advantage over its rivals (Grant 1991) and the RBV allows to identify such resources and capabilities (Wernerfelt 1984). A resource can therefore be seen as "anything which could be thought of as a strength or weakness of a given firm" (Wernerfelt 1984, p. 172) and can consist of physical, human and organizational aspects (Barney 1991). In order to do so, a given resource has to fulfill certain criteria in order to generate sustained competitive advantage (Barney 1991). Even though the RBV mainly refers to strategic aspects, this study also takes its increasing relevance within logistical research (Olavarietta and Ellinger 1997; Wong and Karia 2010) into account. According to the premises of the VRIN approach (Barney 1991), IC-technologies fail to fulfill some of these criteria. However, by serving as the basic for VAS, they become a source of differentiation and therefore for competitive advantage. By following this argumentation IC-technology based VAS are relevant resources within the RBV.

The second fundamental theory for this study is the Service-dominant logic (SDL). As many other relevant theories for logistics research (Defee et al. 2010), the SDL logic is rooted in marketing and was mainly developed and published by Vargo and Lusch (e.g. Vargo and Lusch 2004, 2008). SDL gains growing recognition in logistics and supply chain management research and is mainly used as a "theoretical lens" (Randall et al. 2010, p. 36) to explain and interpret scientific results (e.g. Fawcett and Waller 2012; Yazdanparasat et al. 2010). One of its objectives is the abundance of the dichotomy between physical goods and immaterial services (Vargo and Lusch 2004, 2008) and the integration of these two conflicting understandings into one overall logic. To do so, they introduced ten foundational premises (Vargo and Lusch 2008) while five of them build the second pillar of the theoretical framework for this study: (1) service is the fundamental basis of exchange; (2) goods are distribution mechanism for service provision; (3) operant resources are the fundamental source of competitive advantage; (4) the customer is always a co-creator of value; and (5) a service-centered view is inherently customer oriented and relational. The content of these five foundational

premises are strongly linked to the focus of the conducted study. SDL changes the way we perceive services and LSP have to adapt this way of thinking to stay successful within competition. This assumption is also convergent with the RBV discussed above as SDL shifts the focus towards operant resources like the unique utilization of IC-technologies as a source of competitive advantages (Vargo and Lusch 2004).

## ***2.2 Service Engineering and Innovations at LSP***

The development of new services has been discussed in literature for over 20 years. While leading Anglo-American articles in this field were mainly published in the marketing profession under the key words of “new service development” and “new service design” (e.g. Cooper and Edgett 1999; Edvardsson and Olsson 1996), the German-speaking research community focuses on the term “service engineering” grounded in the areas of technology and innovation management (e.g. Aurich et al. 2010; Bullinger et al. 2003). The concept of service engineering will be the third theoretical pillar of this contribution. Service engineering as a scientific profession can be defined “[...] as a technical discipline concerned with the systematic development and design of services using suitable procedures, methods and tools.” (Bullinger et al. 2003, p. 276). It mainly seeks to counteract the existing disadvantages of ad hoc, spontaneous and unstructured development projects because the list of advantages of a well-planned services development through service engineering is long (e.g. Aurich et al. 2010; Bullinger et al. 2003).

Despite the need for innovative VAS and the existence of corresponding concepts such as service engineering for the development of new service offerings, logistics research has not paid much attention to the topic of innovation yet. For example, Flint et al. (2005) conclude that “[...] logistics research has largely ignored the concept of innovation.” (p. 113). And this observation has not altered over the last years (Busse 2010; Busse and Wallenburg 2011). Next to innovation, especially service development does not seem to be an issue for LSP. Wagner (2008) proved LSP as little innovative compared to companies of other sectors and identified a lack of innovation processes among the logistics industry. Wallenburg (2009) supports these results in his study as well and Busse (2010) revealed the little usage of R&D activities at LSP. Further empirical results on innovations and service development at LSP are missing revealing a scientific gap which has to be closed. To do so, a comprehensive study was conducted. Its content is closely related to the theories of RBV and SDL and it continues the research stream of innovations in the logistics industry. The main goal of the study was to examine the status quo concerning IC-technologies and VAS and their development at LSP. The methodology of the study is described in detail in the next section.

### 3 Research Methodology: Description of the Online Survey Among German LSP

In order to achieve the defined research goal, a comprehensive online survey among the German logistics industry between January and February 2013 was conducted. The focus on Germany is appropriate for two reasons: First, this market segment is the largest in Europe containing the highest sales and it is characterized by a strong segmentation (Klaus et al. 2011). Second, some of the most influencing articles on innovation management in logistics also use the German logistics industry as their sample. As we do so as well, we ensure comparability of our results.

The corresponding companies were identified by using WZ Codes (Destatis 2013) and the Hoppenstedt database. Additionally, selected LSP had to have ten or more employees to exclude micro-enterprises. Following these preconditions, 5,384 firms with their related contact information were identified. After the calculation of a random 90 %-sample out of these companies, 4,846 firms received an e-mail invitation to the online survey. For this purpose, a key informant approach (Daugherty et al. 2009) was applied whereby the relevant executives from the enterprises got the survey invitation. Our online survey was established with regard to the suggestions of Griffis et al. (2003), pretested with five logistics professionals and five logistics professors and all contacted companies got the offer for a summary report and non-financial prizes to encourage responses (Dillman et al. 2009). Furthermore, two reminder e-mails were sent to increase the response rate. In total, 503 responses were received which results in a response rate of 10.4 %. With reference to Wagner and Kemmerling (2010), an acceptable response rate for logistics research was achieved.

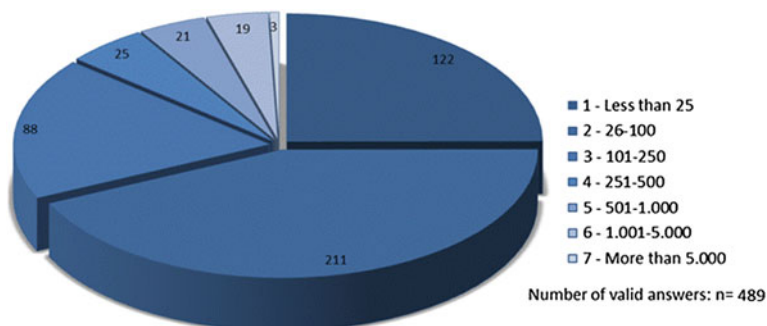
In order to ensure reliability, both nonresponse bias and common method bias were evaluated. Item-nonresponse was covered by using a modified complete case analysis resulting in the elimination of questionnaires with less than 90 %-filled items. In total, 14 questionnaires had to be removed from the sample. Unit-nonresponse was addressed through an extrapolation based on a last respondent approach (Armstrong and Overton 1977). A symmetrical t-test for dependent samples with a 5 % significance level was used to test ten independent items answered by the first and the last 73 participants. As all pairs show  $p > 0.05$ , unit-nonresponse is not considered as a problem in this survey. A common method bias can arise from the key informant approach (Podsakoff and Organ 1986) and it “[...] refers to the degree to which correlations are altered (inflated) due to a methods effect.” (Meade et al. 2007, p. 1). A common method bias can originate from the applied key informant approach. To assess its possible existence, the Harman’s single factor test (Podsakoff et al. 2003) and the marker variable technique (Lindell and Whitney 2001; Podsakoff et al. 2003) were used. The results of both procedures indicated that common method bias is not an issue and that the achieved results are valid and reliable.

#### 4 Research Results: LSP Are IC-Technologies and VAS Oriented—but They Lack Formal Structures

In this section, the results of the study are presented. Following the key informant approach, 78 % of the survey participants are members of the executive board belonging to the top management of the respective firm. The distribution of company sizes among the sample reflects the overall structure of the German logistics market (see Fig. 1): The main part of the participating LSP has 250 and less employees and can therefore be considered as small and medium sized enterprises. This observation leads to the conclusion that the achieved results can be considered as valid for the whole population.

A close look on the current and future IC-technology based VAS offered by the LSP (Preiß and Weber 2012) reveals two facts. First, especially tracking & tracing and information provision via the internet are widespread offerings among LSP. Second, only 47 of the companies do not plan to offer IC-technology based VAS in the future. The need for differentiation and the potential of innovative services seems to be widely recognized and accepted among LSP. Additionally, Fig. 2 shows, that currently 148 companies of the sample are not providing any of the listed VAS. By the time, IC-technology based VAS still offer the possibility of differentiation and can serve as a source for competitive advantages.

The study also shows the positive impact of VAS on the financial performance of the companies: 219 LSP would describe the profitability of their VAS as relatively positive compared to their competitors. If VAS are offered to the market, they are obviously accepted by the customers and ensure the overall financial success of the enterprise. Despite their positive profitability, the share of revenue generated by VAS is very diverse throughout the sample, see Fig. 3. This result can be interpreted differently. It indicates that LSP still focus on the traditional logistics services such as transportation and that VAS still play a minor role for these companies' overall turnover. Nevertheless, there are first pioneers among the sample earning more than 20 % of their revenue with VAS.



**Fig. 1** Number of employees at the participating logistics service provider

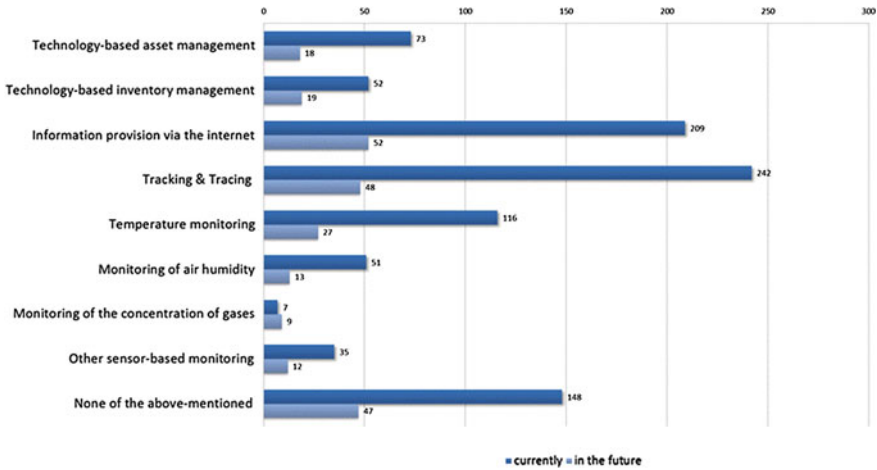


Fig. 2 Currently and future offerings of value added services

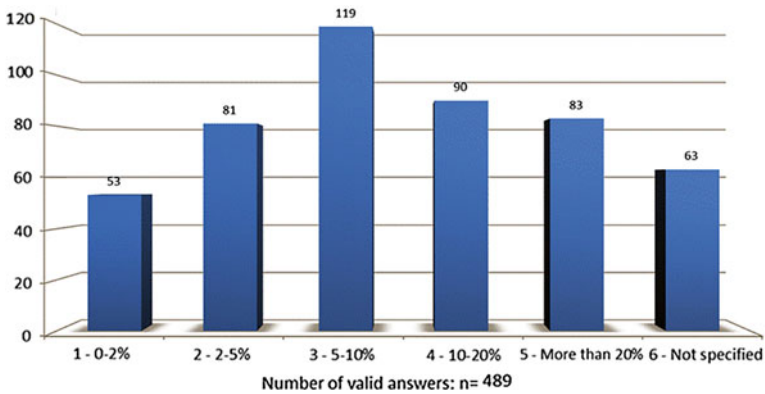
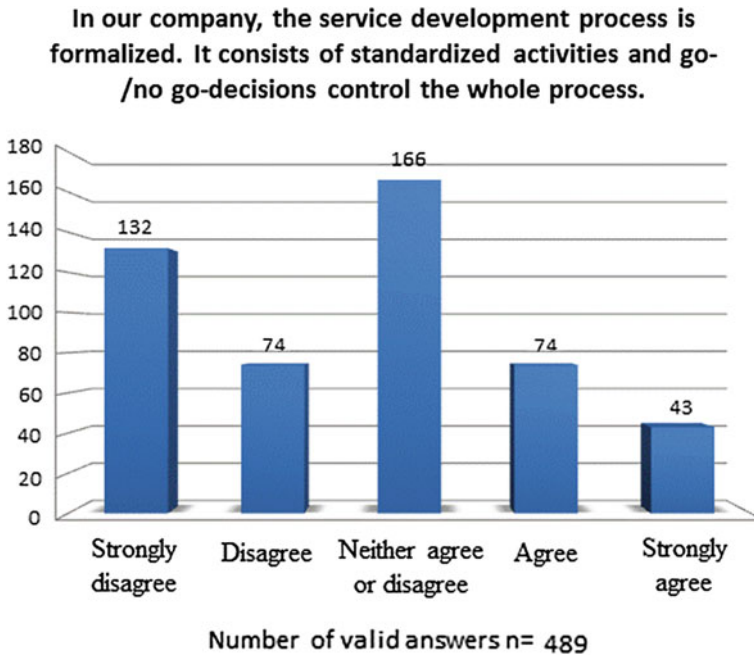


Fig. 3 Share of revenue earned through value added services

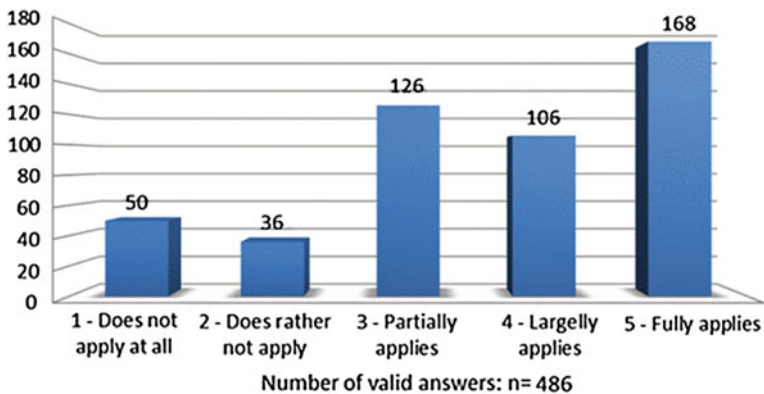
To answer the main research question of this contribution holistically, we also intend to shed a light on the underlying development processes for IC-technology based VAS established by LSP. To do so, one objective was to determine the awareness concerning the service engineering concept. With 13 % only a small number of the participants know this concept. In combination with the lack of a dedicated innovation strategy (51 % do not have any one and another 35 % only have a rudimental version) and missing formalized processes for the development of new service offerings (see Fig. 4), LSP can still be described as little innovative without a sufficient innovation management.

Although there is a lack of formal structures for a successful service development, VAS play an important role for LSP and the majority (46.1 %) regards VAS



**Fig. 4** Self-assessment of the process formalization concerning the development process for VAS

as an important part of their overall business strategy. This contrasts with the results of missing innovation strategies and little formalized development processes. Concerning the orientation towards IC-technologies, it can be noted that 314 enterprises follow the technological developments on the market. Additionally, the majority perceives IC-technologies as a source of differentiation (see Fig. 5).



**Fig. 5** Self-assessment of IC-technologies as a source of differentiation



## 5 Implications and Limitations

To sum it up, the conducted study and the presented descriptive results reveal a controversy: On the one hand, LSP would describe themselves as both IC-technology and VAS oriented and it can be concluded that the enterprises have realized the need for differentiation. On the other hand, it seems that they lack the formal and organizational premises for the development of IC-technology based VAS. LSP tend to miss defined processes for the structured development of VAS in the sense of a service engineering approach and they neglect the importance of an innovation strategy for the implementation of a companywide innovative mindset.

### 5.1 Theoretical and Managerial Implications

The theoretical implications of this work are twofold. First, it continues with the young and still underdeveloped research stream about innovation in the logistics industry. It provides a solid empirical foundation of primary data and helps to understand innovation and differentiation intentions of LSP. The results underline previous findings, for example of Wagner (2008) and Busse (2010), who identified logistics companies as lacking structures for the development of innovations. But the presented results also show some changes in the mindset of the top management. VAS and IC-technologies are perceived as valuable sources for differentiation and LSP start to reconsider their attitude towards innovative service offerings. The second theoretical implication concerns the used theoretical concepts. With SDL and service engineering two concepts form the basis for this research, which have not gained much attention among logistics and supply chain management research yet. Both rose in marketing and can offer useful insights related to service issues. From our point of view, a wider use of these two concepts improves the understanding of the dynamics of VAS and their potential for the success of LSP better and they deserve more attention from the scientific community.

The achieved results also lead to some managerial implications. Under the threatening market conditions, IC-technology based VAS promise a way for differentiation and solid turnover streams. They can build a counterbalance to the traditional logistics services which have turned out as commodities. Nevertheless, such types of service offers seem to be new to many LSP. To design them successfully, a functioning innovations management including defined development processes is needed. Consequently, top management should lay a special focus on this topic in the nearer future.

## 5.2 *Limitations and Outlook*

Limitations of the applied research methodology are mainly rooted in the focus of the study. The regional focus was laid on Germany and German LSP. Therefore, the results can only be generalized for this area. The participated companies reflect the German logistics market very well but the study misses some large companies. Only three participants have more than 5,000 employees. Including more big players of the logistics market might lead to a more sophisticated analysis of the current situation at LSP. The third limitation rises from the tight focus on IC-technology based VAS of this study. Next to them, there are many other VAS available to the customers, which have no or only little technological background. The last limitation is related to the presentation of the results. The descriptive data presented in this contribution does not provide any insight into the requirements of a successful VAS development nor does it prove the positive financial impact of such VAS.

Nevertheless, the limitations can be used as a valuable source for future research activities. It would be of scientific value to include more countries into the study, especially overseas or from the second and third world, and to compare the achieved results in the sense of a benchmark. Furthermore, the examination of the status quo concerning IC-technology and VAS orientation at different industry sectors and comparing them to the findings about the logistics sector might reveal some best practices and help to interpret the results in a different way. A third challenge for future research is the investigation of the underlying relationships between the different orientations, the degree of formal structures for the development of VAS and the overall financial performance of the LSP. Does a defined development process ensure a high quality of the final VAS? And do VAS really influence the financial performance positively? These and other questions have to be answered next.

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