

Collaborative aspects of buying business services – a structural equation model

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Abstract

The focus of this research is to observe the purchaser integration within business service procurement and its impact on the collaboration with both internal customers and external service providers (suppliers). Therefore, different service types were examined in more detail occurring as a contingent factor. Based on structural equation modelling, partial least square analysis (PLS) is applied for this empirical study analyzing questionnaires from Switzerland, Germany, and Austria. In addition to service type specific differences, this research provides a better understanding of the purchaser integration and collaboration during the service procurement process. Furthermore, several implications were deduced to allow managerial support for purchasing professionals.

Keywords: service purchasing, business services, service collaboration, partial least square analysis

Introduction

Within business environments, the purchasing of incoming goods and services is crucial for the success of a company. Even though these activities seem well established, difference can be found. While the purchasing of goods normally appears highly professional, service purchasing is still challenging for purchasing managers (van der Valk and Rozemeijer, 2009). This fact typically relates to specific characteristic of business services, e.g. the immateriality, simultaneousness, or heterogeneity (Grönroos, 2008). Moreover, the purchasing of business services is always based on a performance promised that cannot be secured by standardized procedures known from goods purchasing (e.g. test products) (Haller, 2002).

A major challenge within the field of service purchasing relates to the adequate evaluation of quantitative and qualitative evaluation criteria. Evaluation tools barely exist or base upon altered versions of tools used for goods purchasing. Normally, these tools do not meet the specific requirements regarding service purchasing (Getz et al., 2001). Due to a service related heterogeneity, recent research revealed required evaluation differences regarding the service type (Haensel and Hofmann, 2016a, van der Valk et al., 2009). While a company acquires services for different assigned purposes, there are also different entities involved in an

evaluation procedure (e.g. the purchaser, the essential user (internal customer), a supplier, or an end customer). Some services are exclusively purchased for internal reasons (e.g. a facility service) whereas other services (e.g. assembly services) are directly integrated within production processes (Wynstra et al., 2006). Consequently, the role of a purchaser as well as the integration within the different purchasing phases (referred as level of purchaser integration) might vary (Haensel and Hofmann, 2016b).

Moreover, service purchasing as well as the quantitative and qualitative evaluation occurs within different phases (Rottmann et al., 2015). Before firms sign a service contract, requirements need to be defined (e.g. from the essential user). Subsequently, an individual or cross-functional assessment takes place evaluating whether a service tender meets these requirements. Retrospectively, an evaluation occurs again when the essential user compares the service outcome with an initial service performance. During all these phases, collaboration with both the internal customer and the supplier is essential for a successful purchase (Chakraborty et al., 2014).

As research barely exists on collaborative aspects within service evaluation as well as on the related service type the paper provides an empirically investigation using structural equation modelling. More precisely, the paper examines the following research questions:

RQ1: What are the effects of purchaser integration on the collaboration with both supplier and internal customer?

RQ2: In which way is the applied service strategy and the related service type affecting the impact of purchaser integration?

To provide some detailed answers to the research questions, an empirical analysis using structural equation modelling is applied. These types of models are used to observe interdependencies within an multiple-item scale (Chin and Newsted, 1999). Moreover, a partial least square analysis is used to examine the model. In the beginning, a literature overview is initially provided. This section provides insights into the purchaser integration and the differentiation of service types. Furthermore, it establishes the research hypotheses for our model. Within the methodology section, the measurement and structural model is analysed in more detail, deriving statistical results and a final discussion.

Literature overview and development of research hypotheses

In the first section, the research presents a literature overview about consolidated insights from exiting literature in the field of service purchasing. This includes literature on purchaser integration also addressing the collaborative aspect within different purchasing phases. In addition, a strategic service adaptation is analyzed – often seen as the cornerstone within a purchasing organization. On this basis, the current state of research is revealed and research hypotheses for our structural equation model emerge.

Purchaser integration as determining factor for collaboration

Every purchasing process occurs as a set of subsequent activities during different periods (Robinson et al., 1967, Gallouj, 1997) also referred to as purchasing phases (Axelsson and Wynstra, 2002). Robinson et al. (1967) therefore provide one of the first descriptions of a procurement procedure, distinguishing between several purchasing phases. This also relates to a service evaluation, as different criteria are rated during different purchasing phases involving input from different entities (Ellram et al., 2007). Typically, the purchaser is directly or at least

indirectly involved in these phases, determining the success of a required exchange that occurs with suppliers, internal customers, or other related institutional actors. Lejeune and Yakova (2005) examine an increased relevance for procurement integration, naming it as one of the most relevant success factors for supply chain management.

In general, an enhanced integration typically induces an exchange of different immaterial resources. In this context, Håkansson and Snehota (2006) describe four dimensions that determine the exchange: information, financial, service, and social exchange. As an asymmetry of available information is undoubted (Laffont and Martimort, 2009), one focus of collaboration lies in an efficient minimization of this discrepancy.

When talking about collaboration, different aspects are mentioned in literature. Large (2005) states communication and information sharing as basic elements for purchasing behavior. This includes e.g. feedback talks with internal customers (Danese and Romano, 2011) but also shared goals, visions, and production plans with suppliers (Chen et al., 2004). Both collaborative aspects are described as enablers for purchasing but also for the firm performance (Danese and Romano, 2011). Therefore, the paper examines the following hypothesis:

H1a. Purchaser integration improves internal customer collaboration directly.

H1c. Purchaser integration improves supplier collaboration directly.

Buyer's knowledge base as mediator for collaboration

Grant (1996) describes knowledge as a fundamental resource within a firm and postulates it as a major element that influences other areas (resources) within a firm. The knowledge base within a firm typically manifests in existing and stored information but also in the knowledge base of human resources. Consequently, it is suggested that the impact of purchaser integration is always mediated by the buyer's knowledge base and the related knowledge base. Zablah et al. (2010) name previous purchaser experiences as essential for a purchasing process.

However, the required buyer's knowledge base is always dependent on purchasing specifications, e.g. the frequency a service is acquired. Typically, one can distinguish whether a service is procured for the first time, as repurchase, or as adapted (modified) repurchase.

H1b. Purchaser integration improves internal customer collaboration indirectly through buyer's knowledge base.

H1d. Purchaser integration improves supplier collaboration indirectly through buyer's knowledge base.

Service strategy adaptation as a fundamental purchasing factor

While talking about purchasing processes and about implied impacts on collaboration, one must also consider a service strategy adaptation that sets the basic cornerstones for a purchasing organization (Chen et al., 2004). In general, a service strategy adaptation is expressed by several independent variables normally addressing existing resources. In this context, Wynstra et al. (2006) suggest a clear differentiation between a goods and service strategic focus within a business environment. This avoids a one-sided perspective on purchasing and helps to meet the requirements regarding specific service characteristics. Nevertheless, this impact of a strategy goes even further. As a purchasing strategy is also considered within the overall firm strategy, it also affects other business areas (Carr and Pearson, 2002). Typical practical impacts relate to savings (Chen et al., 2004) and quality improvements for services (Narasimhan and Das, 2001)

that need to be measured in terms of their contribution to overall company goals. Because of the discussion, the initial hypotheses are adapted considering the direct (and indirect) service strategy impact as follows:

H2a (b). Service strategy adaptation improves internal customer collaboration directly (indirectly through buyer's knowledge base).

H2c (d). Service strategy adaptation improves supplier collaboration directly (indirectly through buyer's knowledge base).

Moreover, it is assumed that a service strategy adaptation within a firm – as a basic organizational element also affects other business areas. This fact suggests an impact on the purchasing integration as well. Consequently, the last hypotheses addresses an interdependency between a service strategy and the purchaser integration:

H2e. Service strategy adaptation improves the purchaser integration directly.

Service types and a related point of consumption as contingency

Generally, different classifications for business services are available in literature addressing varying requirements for different institutions or viewpoints (Axelsson and Wynstra, 2002). A classification, described by Wynstra et al. (2006), differentiates between four service types: consumption, instrumental, manufacturing, as well as component services. This classification addresses a consumer of acquired services (Haensel and Hofmann, 2016a) but is also applied in quality management approaches (Holschbach and Hofmann, 2011). The basic characteristics are shortly explained as follows:

- Consumption service: If a buying company exclusively uses (or consumes) an acquired service, one speaks about consumption services. Practical examples lie in the business area of facility services or accounting and controlling services.
- Instrumental service: These types of services are crucial but not limited to all manufacturing companies as a value-adding process occurs. Typically, a firm integrates component services within their production services and focuses on a generation of value. Assembly services but also specific types of logistic services occur as managerial examples.
- Manufacturing service: Firms acquire these types of services and undertake an alteration before an offer to end-customers occurs. Therefore, these services induce a value-creation process comparable to component services. As a strict differentiation between instrumental and manufacturing services is difficult, both types of services apply as value-adding services within the research.
- Component service: The last group considers all services, firms offer directly and without any induced changes to their end-customers. In a practical context, examples can be found in different after sale and telephone services conducted by external partners.

As aforementioned, different entities within the firm are responsible for the evaluation, depending on the type of service. Moreover, the service type also determines the requirements for an evaluation procedure and the implicit scope of communication with both the supplier and internal customer. It also determines the complexity of a purchase, as e.g. value-adding services are normally more complex in their nature but also more relevant for a company than consumption services. Furthermore, it is expected but so far not revealed that a reduced possibility to affect the internal customer collaboration occurs for specific service types. To

provide empirical proof for all hypotheses, a contextual analysis within our research aims to reveal a clear differentiation.

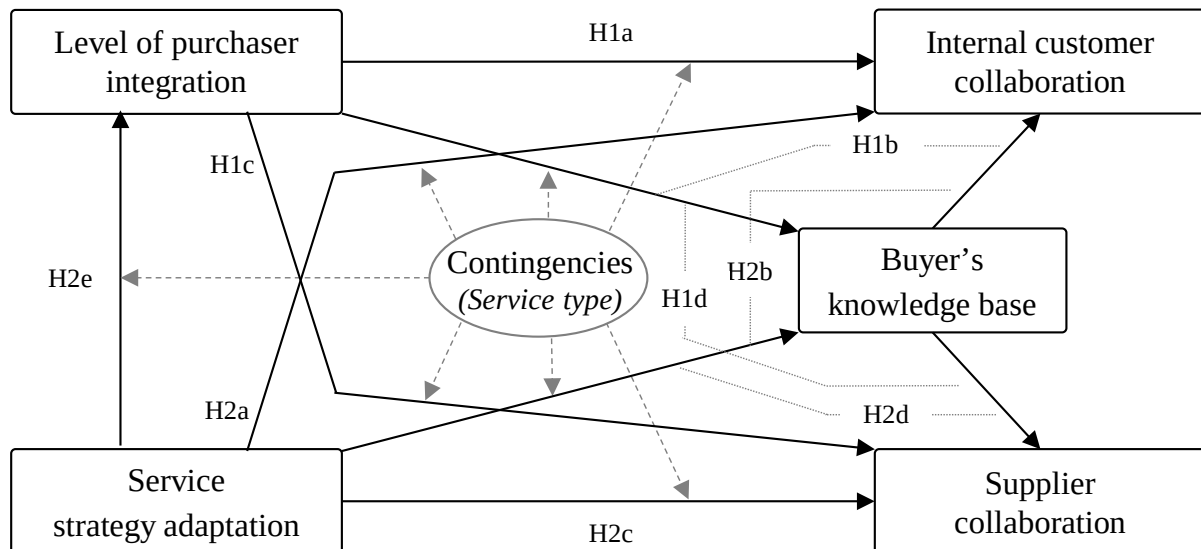


Figure 1: Conceptual research model

Design of research and methodology

Questionnaire design

In accordance with exiting literature, a questionnaire was designed to measure the impact of a purchaser's integration on collaborative aspects and to test the aforementioned hypotheses. For all constructs, a five-point Likert-scale was applied (1 = "strongly disagree" to 5 = "strongly agree"). Next to a firm's demographic profile (incl. industry affiliation, number of employees, annual revenue, and purchasing volume), different service types were considered within the study. More precisely, consumption, component, as well as value-adding services (van der Valk et al., 2009) were considered. The inclusion of categorical variables (firm size, etc.) allow a contextual differentiation as differences regarding the firm sizes might occur.

Altogether, five independent variables were used to measure the direct and indirect impact of purchaser integration as well as the basic impact of an applied service strategy within a company. This includes the supplier and internal customer collaboration, the applied service strategy, a buyer's knowledge base as well as the purchaser integration. The scale consists of 28 measurement items that were adopted, modified, or proposed from existing literature (Table 1). Adopted items were selected from existing literature without any changes, whereas modified and proposed items were derived from findings in literature. A more detailed overview of all applied questions (measurement items) is provided in the appendix. Before the study was distributed, a pilot test was conducted by using a sample of five mid-sized and large-scaled firms within Switzerland. This helped to assure clarity of all addressed questions and to improve the original version of the questionnaire.

Table 1: Sources of the measurement items

Variable	Measurement items		
Internal customer collaboration	IC1, IC2, IC3	Fredendall et al. (2005)	Adopted
	IC4	Danese and Romano (2011)	Adopted
	IC5	Stanley and Wisner (2002)	Modified
Level of purchaser integration	PI1	van der Valk et al. (2009)	Proposed
	PI2	Van Poucke et al. (2016)	Proposed
	PI3	González-Benito (2007)	Modified
	PI4	Narasimhan and Das (2001)	Adopted
	PI5	Stanley and Wisner (2002)	Proposed
	PI6	Ittner et al. (1999)	Modified
Supplier collaboration	SC1	Touboulic and Walker (2015)	Adopted
	SC2, SC3	Narasimhan and Das (2001)	Modified
	SC4, SC7	Claassen et al. (2008)	Adopted
	SC5	Danese and Romano (2011)	Adopted
	SC6	Chen et al. (2004)	Adopted
Buyer knowledge base	BK1	D'Antone and Santos (2016)	Modified
	BK2, BK4	Carter et al. (1999)	Modified
	BK3	Van Poucke et al. (2016)	Proposed
	BK5	Karimi et al. (2015)	Proposed
Service strategy	SS1	Wynstra et al. (2006)	Proposed
	SS2	Carr and Pearson (2002)	Adopted
	SS3	González-Benito (2007)	Adopted
	SS4	Chen et al. (2004)	Modified
	SS5	Narasimhan and Das (2001)	Adopted

Collection of data and sampling

In the beginning of 2016, the survey was sent to approximately 2,500 firms within Switzerland, Germany, and Austria (DACH region). As the economic development within the DACH region is highly distinctive (Wagner, 2008), the survey as well as the results are considered representative for other developed economies. The study was conducted by the Chair of Logistics Management from the University of St.Gallen in cooperation with two Swiss public associations and a procurement consultancy (located in Austria, Switzerland, and Germany). In sum, four different databases were used, allowing a specific clustering in a firm's location and in a respondent's job position. Due to a specific purchasing context, the survey was exclusively sent to purchasing related employees (e.g. operative and strategic purchasing, managerial purchasing staff, etc.). As no firms are excluded in the database, the sample is assumed to be randomized. With the intention to meet the multi-lingual requirements within Switzerland, the online survey was available in German, French, and English. To assure the same meaning in each version, the original German version was translated by a native translating agency.

All questionnaires were mailed along with a short cover letter to explain the intention as well as the objectives of the study. Additionally, follow-up telephone calls and two reminder e-mails were used to increase the response rate and two reduce the possibility of Common Method Bias. Among the contacted firms, approximately 150 questionnaires were returned. However, due to incomplete questionnaires, only 103 were complete and usable for the research. This yields a response rate of around 4%, which is acceptable for empirical research (Curtin et al., 2000). A summarization of all participants is displayed in Table 2.

Table 2: Overview of the participating companies

	Count	%		Count	%
Total	103	100		103	100
Annual revenue (million CHF)			Employee number		
<10	10	9.8	<50	7	6.9
<50	9	8.8	<100	6	5.9
<100	10	9.8	<250	13	12.7
<250	11	10.8	<500	10	9.8
<500	12	10.8	<1000	21	19.6
<1000	9	8.8	<10000	29	28.4
<5000	22	21.5	<100000	13	12.7
<10000	5	4.9	>100000	4	3.9
>10000	15	14.7			
Industry affiliation					
Trade	6	5.9	Process Industry	11	10.8
Construction industry	5	3.9	Service Industry	23	22.5
Public institutions	8	7.8	Manufacturing industry	28	27.5
Consumer Goods	15	14.7	Logistics and Transport	7	6.9

Conceptual framework and applied methodology

The conducted study applies a structural equation models that uses a multiple item-scale. Typically, equation models ensure more realistic constructs that impute interdependencies between different items (Reinartz et al., 2009). In literature, two major approaches exist: covariance-based and variance-based analyses (Henseler et al., 2009). Within the study, partial least square analysis (PLS) – a variance-based approach – is used. This method is described in literature as more accurate than comparable approaches (Reinartz et al., 2009). With the intention to allow the assessment of the measurement and structural model, the software SmartPLS (version 3.0) is used. Moreover, a bootstrapping estimation procedure is applied (Efron and Tibshirani, 1986). This allows the creation of 500 random samples based on the original data set. This procedure allows an improvement and more precise examination of the significance of the factor loadings and the measurement model (Chin, 1998).

As described beforehand, two major aspects are essential for the usage and the success of an evaluation procedure for business services: internal customer collaboration and supplier collaboration (Danese and Romano, 2011). As the research aims to examine the impact of a purchaser integration on both collaborative aspects, a direct dependency as well as an indirect impact through buyer's knowledge base is applied in the research model. In the same way, dependencies regarding the service strategy adaptation are included. Moreover, the model considers the possible influence of the service strategies on the purchasing integration. As the impact of the described items might vary regarding the ascribed context, a contingency approach is applied as a theoretical foundation (Neu and Brown, 2005, Kohli, 1989). An overview of the applied conceptual research model is depicted in Figure 1.

Research results of the structural equation model

Measurement model

Initially, a confirmatory factor analysis is executed for all measurement items to ensure indicator reliability for all variables. In this context, Hulland (1999) recommends factor

loadings above 0.7. Hence, one item (SS1) was removed due to a factor loading below the acceptable value. As fit indices, we used a Chi-squared per degree ratio, which is 1.57 and therefore acceptable (Bollen and Long, 1993). Moreover, a SRMR value of 0.054 is lower than the recommended 0.08 from Hair et al. (2014). To assure a none-response bias, we used t-tests by separating the participants in early and late respondents. In a next step, composite reliability (CR), convergent validity as well as discriminant validity was observed for all items (Zhang et al., 2015) as depicted in Table 3.

Table 3: Measurement analysis

Item	Loadings	t-Value ^a	Mean	SD	CR	AVE
<i>Internal customer collaboration ($\alpha = 0.92$)</i>						
IC1	0.788	15.349	3.55	1.103	0.939	0.756
IC2	0.882	28.887	3.09	1.096		
IC3	0.873	19.324	3.66	1.122		
IC4	0.885	26.616	3.39	1.167		
IC5	0.912	52.752	3.33	1.168		
<i>Level of purchaser integration ($\alpha = 0.93$)</i>						
PI1	0.837	18.908	3.58	1.197	0.947	0.750
PI2	0.830	17.690	3.58	1.216		
PI3	0.913	36.984	3.73	1.060		
PI4	0.837	18.149	3.52	1.084		
PI5	0.899	32.872	3.68	1.148		
PI6	0.877	32.458	3.35	1.084		
<i>Supplier collaboration ($\alpha = 0.92$)</i>						
SC1	0.821	21.031	3.14	1.237	0.933	0.666
SC2	0.859	25.153	2.89	1.244		
SC3	0.847	21.676	2.99	1.297		
SC4	0.789	17.617	2.84	1.260		
SC5	0.884	36.178	2.95	1.208		
SC6	0.710	11.434	2.91	1.210		
SC7	0.788	18.536	2.29	1.182		
<i>Buyer knowledge base ($\alpha = 0.89$)</i>						
BK1	0.817	26.168	3.24	1.270	0.920	0.698
BK2	0.791	16.383	2.79	1.494		
BK3	0.843	23.182	3.17	1.347		
BK4	0.861	34.108	2.64	1.355		
BK5	0.864	30.369	3.08	1.303		
<i>Service strategy ($\alpha = 0.84$)</i>						
SS2	0.805	19.600	3.07	1.137	0.893	0.676
SS3	0.842	24.904	2.55	1.171		
SS4	0.802	19.602	2.92	1.294		
SS5	0.839	31.679	2.86	1.201		

Notes: CR = composite reliability, AVE = average variance extracted, α = Cronbach's alpha
^a All items are significant at the $p < 0.01$ level.

The composite reliability range from 0.893 to 0.947 and are therefore higher than the recommended value from 0.7 (Nunnally and Bernstein, 1994). In addition, one can observe the construct reliability by using Cronbach's alpha (Cronbach, 1951). However, Henseler et al. (2009) revealed an underestimation of Cronbach's alpha within PLS analyses and recommended using the depicted composite reliability. The convergent validity is assessed by observing the average variance extracted (AVE) (Hair et al., 2006), typically accepting values above 0.5. In the study, the values range from 0.676 to 0.756. Based on the AVE, it is possible to observe the discriminant validity. Therefore, Fornell and Larcker (1981) recommend comparing the correlation of each construct with the square root of the AVE (Table 4). The diagonal appears to be higher than all correlations, a fact that indicates discriminant validity. Moreover, discriminant validity on the indicator level is given as the indicator loading is higher than the cross-loadings (Chin, 1998).

Table 4: Discriminant validity

Construct	Mean	SD	IC	PI	SC	BK	SS
<i>Int. customer collaboration (IC)</i>	3.398	1.16	<u>0.869^a</u>				
<i>Purchaser integration (PI)</i>	3.604	1.16	0.848	<u>0.866</u>			
<i>Supplier collaboration (SC)</i>	2.888	1.28	0.776	0.791	<u>0.816</u>		
<i>Buyer knowledge base (BK)</i>	2.976	1.38	0.707	0.707	0.680	<u>0.835</u>	
<i>Service strategy (SS)</i>	2.858	1.22	0.589	0.561	0.655	0.681	<u>0.822</u>

Notes: ^a On the diagonal, the square root of the average variance extracted (AVE) for each construct is presented. The other lines represent the inter-construct correlation, whereas the correlation is significant ($p < 0.01$).

Structural model

Along with the assessment of the measurement model, PLS analysis is also used to observe the structural model (Figure 1). Therefore, it is required to measure the coefficient of determination also referred as adjusted R squared (R^2) (Chin and Newsted, 1999) and the path coefficient (Chin, 1998). The model explains 31% of the PI variance, 75% of the IC variance, and 68% of the SC variance. In accordance to Chin (1998), these results are substantial. Moreover, the path coefficients (p_c) reveal a significant influence of the purchaser integration on the supplier collaboration ($p_c = 0.659$, $p < 0.01$) and on the internal customer collaboration ($p_c = 0.578$, $p < 0.01$). These results support the hypotheses H1a and H1c. An indirect impact through buyers' knowledge is revealed exclusively on internal customer collaboration ($0.474 \times 0.205 = 0.097$, $p < 0.01$). There is no significant PI influence on the supplier collaboration through a buyer's knowledge base. Hence, hypothesis H1b is supported whereas H1d is rejected.

The same observation was conducted for the service strategy adaptation. The analysis revealed a significant influence of the service strategy adoption on the supplier collaboration ($p_c = 0.273$, $p < 0.01$) but no significant impact on the internal customer collaboration. This result supports hypothesis H2c but rejects H2a. On the contrary, the service strategy adaptation has an indirect influence on the internal customer collaboration through the buyer's knowledge base ($0.415 \times 0.205 = 0.085$, $p < 0.01$) but no indirect impact on the supplier collaboration (through BK). These results support hypothesis H2b and reject H2d. The last hypothesis (H2e) examines the basic impact of a service strategy adaptation on the purchaser integration. Within the PLS analysis, a strong and direct impact was revealed ($p_c = 0.561$, $p < 0.01$) which supports the hypothesis H2e.

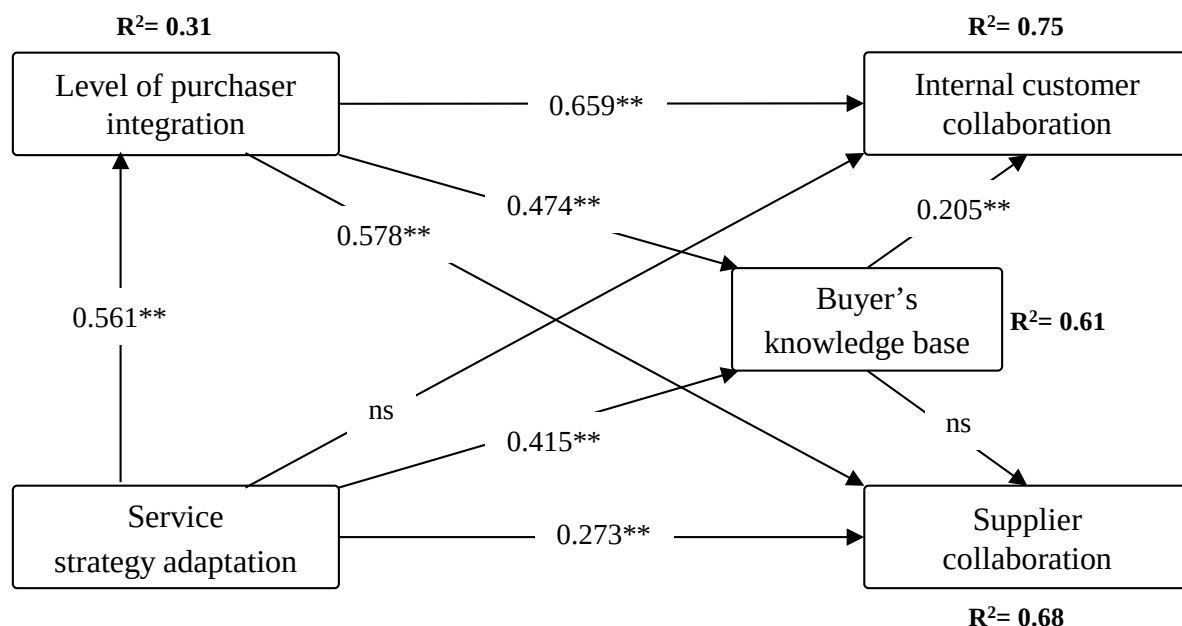


Figure 2: The structural model

(** Factor loading is significant at $p < 0.01$, ns = no significance)

Contextual analysis

With the intention to investigate the aforementioned hypotheses for different service types, a contextual analysis was applied for the research model (Table 5). For the measurement of indirect effects, the approach from Sobel (1982) was applied. As revealed in the literature overview, the analysis considers three service types: consumption, component, and value-adding services. The strongest influence of the purchaser integration on collaborative aspects was revealed for value-adding services ($PI \rightarrow IC$: $p_c = 0.647$, $p < 0.01$ and $PI \rightarrow SC$: $p_c = 0.504$, $p < 0.01$). However, there is no indirect impact through a buyer's knowledge base. This aspect changes while observing consumption services. An indirect impact through a buyer's knowledge base on the internal customer collaboration was examined ($p_c = 0.174$, $p < 0.01$). For component services, the contextual analysis revealed that the purchaser integration has no statistically significant influence on supplier and internal customer collaboration.

Table 5: Contextual analysis (path coefficient and t-values)

(* Factor loading is significant at $p < 0.1$)

Direct relationship (indirect)	Total sample ($n = 103$)	Service type differentiation		
		Consumption ($n = 43$)	Value-adding ($n = 45$)	Component ($n = 15$)
H1a $PI \rightarrow IC$	0.659 (7.52)	0.496 (4.99)	0.647 (5.55)	ns
H1b $PI \rightarrow IC$ (BK)	0.097 (1.97)	0.174 (2.79)	ns	ns
H1c $PI \rightarrow SC$	0.578 (7.79)	0.457 (3.40)	0.504 (3.98)	ns
H1d $PI \rightarrow SC$ (BK)	ns	ns	ns	ns
H2a $SS \rightarrow IC$	ns	ns	ns	ns
H2b $SS \rightarrow IC$ (BK)	0.085 (2.04)	0.171 (2.83)	0.102 (1.65)*	ns
H2c $SS \rightarrow SC$	0.273 (4.85)	0.283 (2.22)	0.362 (2.82)	ns
H2d $SS \rightarrow SC$ (BK)	ns	ns	ns	ns
H2e $SS \rightarrow PI$	0.561 (5.74)	0.622 (7.04)	0.490 (3.79)	0.651 (2.71)
Coefficient		IC(0.81), PI(0.37)	IC(0.72), PI(0.22)	IC(0.84), PI(0.40)
determinants (R^2)		BK(0.66), SC(0.72)	BK(0.49), SC(0.61)	BK(0.85), SC(0.75)

A slightly different picture was revealed in the contextual analysis on service strategy adaptation. While a direct and indirect impact on component services is also missing, differences occur for consumption and value-adding services. In comparison to the influence of the purchaser integration, the service strategy adaptation has a higher indirect impact on collaboration (through BK) for consumption services (SS→IC (BK): $p_c = 0.171$, $p < 0.01$ and SS→SC (BK): $p_c = 0.102$, $p < 0.10$). However, the strongest impact of the service strategy adaptation on the purchaser integration appears for component services ($p_c = 0.651$, $p < 0.01$).

Discussion and conclusion

The aim of the research was to examine the impact of a purchaser integration within different purchasing phases (processes) on the collaboration with both suppliers and internal customers. Therefore, the paper provides some detailed insights concerning purchaser integration in the field of business services acquisition. The results indicate differences within the strategic focus but also for the development of a purchaser and its integration in terms of adequate evaluation procedures. To allow a structural comparison of the results and to reason the outcome, the discussion separates both sections: the purchaser integration and the service strategy adaptation.

The impact of purchaser integration

The analyses reveals obvious differences depending on the acquired type of service. For the internal customer collaboration, the integration of a purchaser shows its major direct and significant impact on value-adding services. This result supports recent assumptions derived from literature (Haensel and Hofmann, 2016b, van der Valk et al., 2009) as firms prioritize these type of services due to their relevance. However, no indirect impact through a buyer's knowledge base was noticed for the internal customer collaboration regarding value-adding services. While looking at consumption services, the examination shows an indirect and significant impact through a buyer's knowledge base. This might relate to a reduced need for a cross-functional purchase as the buying firm primarily consumes the services itself (Holschbach and Hofmann, 2011). Therefore, the buyer's knowledge base mediates the purchaser integrations impact more strongly. No impact is noticed for component services. A possible explanation lies in a more standardized characteristic of these service types, as component services are just an unaltered part of the offer to the end-customer (van der Valk et al., 2009).

The examination reveals a similar picture when observing a purchaser's integration impact on supplier collaboration. The major direct and significant impact occurs for value-adding services followed by consumption services. These findings seem expectable, as purchasers need to be more integrated within value-adding processes and more aware of internal customer needs and supplier specifications, occurring as a link between both sides (Touboulic and Walker, 2015). In addition, the findings also provide strategic alignments for the service provider as communication and collaboration is crucial for the fulfilment of customer needs (Young and Varble, 1997). Again, for component services that are provided as unaltered parts of a firms offer to the end-customer, the purchaser integration does not affect the internal customer collaboration. This might derive from an associated service relevance for companies in comparison to value-adding services.

The impact of a service strategy adaptation

With a view to the service strategy adaptation, a slight shift of its impact is noticed. First, the analysis reveals no direct impact on the internal customer collaboration. Even though other studies could demonstrate a significant impact on other core business areas – postulating the strategy as a fundamental aspect within a company (Van Weele, 2009, Gebauer et al., 2010), the present analysis does not reveal similarities for the service strategy. However, this applies exclusively for the direct impact on customer collaboration. With a view to addressed mediators, an indirect impact through a buyer's knowledge base is revealed. The contextual analysis again presents obvious differences concerning the acquired service types. The strongest indirect impact occurs for consumption services, followed by value-adding services with a slight impact and component services with no noticeable coherence. Again, the results support early findings from Haensel and Hofmann (2016a).

Concerning the supplier collaboration, the analysis presents slightly different results. As a service purchasing strategy also affects the design of a business relationship with external entities (Van Weele, 2009), an indirect impact is confirmed by the analysis. Again, no significant impact occurs regarding component services. A possible explanation might emerge assuming a reduced complexity of component services and therefore, a less frequent requirement for an extended supplier collaboration. For consumption and value-adding services, a significant and almost identical impact arises. However, the impact on value-adding services is higher as strategy adaptation might imply more changes or consequences for the suppliers of the most relevant (value-adding) services. Contrary to the internal customer collaboration, no indirect impact through buyer's knowledge base is revealed. Again, these findings can be interpreted with a missing impact on the knowledge base of the suppliers' employees.

Several hypotheses that promote the service strategy as a fundamental element are supported. This also applies for the service strategies direct impact on the purchasing integration. For all three different service types addressed in the study, a strong impact could be revealed. In this context, the strongest impact on the purchaser integration occurs for component services. As aforementioned, no direct nor indirect impact on the customer or supplier collaboration originates from a purchaser integration concerning component services. However, expectations appear that the purchaser integration does have other positive affects beside the assumed influence on collaboration. All together, the paper contributes to existing literature streams in the field of purchasing collaboration and verifies the variable "level of purchaser integration" described in previous literature (cf. Haensel and Hofmann 2016b).

Managerial implications and further research

Within a practical context, all of the aforementioned results indicate required difference for a buying organization. It is therefore recommended to be aware of differences regarding the acquired services and to treat them in accordance to their assigned purpose. Moreover, firms need to reassess the required knowledge base of the purchaser as their impact on the purchasing outcome differs. For component services, firms need to question the purchaser's integration and the assigned responsibilities. As the results indicate no impact and as literature assumes primarily standardized services, a shift of responsibilities to the internal customer might be suggested. Within a practical context, firms apply for example an independent (or touchless) purchasing. However, the major impact originates from the service strategy. Consequently, the results indicate to clearly distinguish between a product and a service strategy but also to consider services within the overall company strategy.

Limitations of the research arise as no clear distinction between both forms of value-adding services described by van der Valk et al. (2009) is observed precisely. Moreover, the research implies a generalized acquisition of business services neglecting certain specifics, for example different types of logistic services classifiable in more than one service section. For further research, a consideration of these aspects is recommended. Furthermore, certain implications indicate a relevance for related business areas, for example for the design of adequate evaluation models in terms of service purchasing. As resources are limited, different levels of detail for such models are required. In the same context, firms need an efficient assignment of all involved entities during different purchasing phases. Hence, the paper provides some basic insights within the field of business service purchasing, indicating a starting point for further research.

Appendix

Table 6: Measurement items of the variables

Variable	Measurement items	
Internal customer collaboration	IC1	Request from internal customer are processed immediately.
	IC2	Company decisions always consider the purchasing interests.
	IC3	Clear understanding of internal customers' needs.
	IC4	Regular feedback talks addressing qualitative aspects.
	IC5	Regular feedback talks addressing cost aspects.
Level of purchasing integration	PI1	Purchasing clearly differs between purchasing phases.
	PI2	Purchasing includes a pre-evaluation (make-or-buy).
	PI3	Purchasing is aware of quality requirements of services.
	PI4	Purchasing is aware about different service prices.
	PI5	Purchasing clearly differs between qualitative and quantitative criteria.
	PI6	Purchasing considers operational experience by the essential user.
Supplier collaboration	SC1	Shared and communicated goals.
	SC2	Continuous monitoring system for quality aspects.
	SC3	Continuous monitoring system for cost aspects.
	SC4	Regular information exchange to improve the service performance.
	SC5	Collaborative conduction of quality improvements.
	SC6	Savings are communicated and shared with supplier.
	SC7	Regular insights into sales and inventory data.
Buyers knowledge base	BK1	Purchasing has knowledge about the entire purchasing process.
	BK2	Structured processes to assess the purchasing goal achievement.
	BK3	Purchasers are qualified to be very cost-conscious.
	BK4	Established training programs for service purchasers.
	BK5	Requirement of a sufficient purchasing and market knowledge.
Service (purchasing) strategy	SS1	Clear differentiation between goods and services.
	SS2	Service purchasing strategy is included in the firm strategy.
	SS3	Purchasing trainings are designed to address the service strategy.
	SS4	Savings are measured in terms of their contribution to the strategy.
	SS5	Quality is measured in terms to its contribution to the service strategy.

References

- AXELSSON, B. & WYNSTRA, F. 2002. *Buying business services*, John Wiley.
- BOLLEN, K. A. & LONG, J. S. 1993. *Testing structural equation models*, Sage.
- CARR, A. S. & PEARSON, J. N. 2002. The impact of purchasing and supplier involvement on strategic purchasing and its impact on firm's performance. *International Journal of Operations & Production Management*, 22, 1032-1053.
- CARTER, C. R., AUSKALNIS, R. J. & KETCHUM, C. L. 1999. Purchasing from minority business enterprises: Key success factors. *Journal of Supply Chain Management*, 35, 28-32.
- CHAKRABORTY, S., BHATTACHARYA, S. & DOBRZYKOWSKI, D. D. 2014. Impact of Supply Chain Collaboration on Value Co-creation and Firm Performance: A Healthcare Service Sector Perspective. *Procedia Economics and Finance*, 11, 676-694.
- CHEN, I. J., PAULRAJ, A. & LADO, A. A. 2004. Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22, 505-523.
- CHIN, W. W. 1998. The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295, 295-336.
- CHIN, W. W. & NEWSTED, P. R. 1999. Structural equation modeling analysis with small samples using partial least squares. *Statistical strategies for small sample research*, 2, 307-342.
- CLAASSEN, M. J. T., VAN WEELE, A. J. & VAN RAAIJ, E. M. 2008. Performance outcomes and success factors of vendor managed inventory (VMI). *Supply Chain Management*, 13, 406-414.
- CRONBACH, L. J. 1951. Coefficient alpha and the internal structure of tests. *psychometrika*, 16, 297-334.
- CURTIN, R., PRESSER, S. & SINGER, E. 2000. The effects of response rate changes on the index of consumer sentiment. *Public Opinion Quarterly*, 64, 413-428.
- D'ANTONE, S. & SANTOS, J. B. 2016. When purchasing professional services supports innovation. *Industrial Marketing Management*, 58, 172-186.
- DANESE, P. & ROMANO, P. 2011. Supply chain integration and efficiency performance: a study on the interactions between customer and supplier integration. *Supply Chain Management*, 16, 220-230.
- EFRON, B. & TIBSHIRANI, R. 1986. [Bootstrap methods for standard errors, confidence intervals, and other measures of statistical accuracy]: rejoinder. *Statistical science*, 1, 77-77.
- ELLRAM, L. M., TATE, W. L. & BILLINGTON, C. 2007. Services supply management: The next frontier for improved organizational performance. *California Management Review*, 49, 44-66.
- FORNELL, C. & LARCKER, D. F. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.
- FREDENDALL, L. D., HOPKINS, C. D. & BHONSLE, A. 2005. Purchasing's Internal Service Performance: Critical External and Internal Determinants. *Journal of Supply Chain Management*, 41, 26-38.
- GALLOUJ, C. 1997. Asymmetry of information and the service relationship: selection and evaluation of the service provider. *International Journal of Service Industry Management*, 8, 42-64.
- GEBAUER, H., EDVARDSSON, B., GUSTAFSSON, A. & WITELL, L. 2010. Match or Mismatch: Strategy-Structure Configurations in the Service Business of Manufacturing Companies. *Journal of Service Research*, 13, 198-215.

- GETZ, D., O'NEILL, M. & CARLSEN, J. 2001. Service Quality Evaluation at Events through Service Mapping. *Journal of Travel Research*, 39, 380.
- GONZÁLEZ-BENITO, J. 2007. A theory of purchasing's contribution to business performance. *Journal of Operations Management*, 25, 901-917.
- GRANT, R. M. 1996. Toward a knowledge-based theory of the firm. *Strategic management journal*, 17, 109-122.
- GRÖNROOS, C. 2008. Service logic revisited: Who creates value? And who co-creates? *European Business Review*, 20, 298-314.
- HAENSEL, M. & HOFMANN, E. 2016a. Evaluation of business services from a buyer's perspective: The place of consumption as distinctive feature. *RIRL - International Meeting on Logistics Research 2016*. Ecole Polytechnique Fédérale de Lausanne Lausanne.
- HAENSEL, M. & HOFMANN, E. 2016b. The necessity of an integrative approach for business service evaluation from a buyer's perspective. *28th NOFOMA Conference*. Turku, Finland.
- HAIR, J. F., BLACK, W. C., BABIN, B. J., ANDERSON, R. E. & TATHAM, R. L. 2006. Multivariate data analysis 6th Edition. *New Jersey: Pearson Education*.
- HAIR, J. F., HENSELER, J., DIJKSTRA, T. K. & SARSTEDT, M. 2014. Common beliefs and reality about partial least squares: Comments on Rönkkö and Evermann.
- HÅKANSSON, H. & SNEHOTA, I. 2006. No business is an island: The network concept of business strategy. *Scandinavian Journal of Management*, 22, 256-270.
- HALLER, S. 2002. Dienstleistungsmanagement: Grundlagen–Konzepte–Instrumente, 2., überarbeitete und erweiterte Auflage. *Wiesbaden: Gabler*.
- HENSELER, J., RINGLE, C. M. & SINKOVICS, R. R. 2009. The use of partial least squares path modeling in international marketing. *Advances in international marketing*, 20, 277-319.
- HOLSCHBACH, E. & HOFMANN, E. 2011. Exploring quality management for business services from a buyer's perspective using multiple case study evidence. *International Journal of Operations & Production Management*, 31, 648-685.
- HULLAND, J. 1999. Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic management journal*, 20, 195-204.
- ITTNER, C. D., LARCKER, D. F., NAGAR, V. & RAJAN, M. V. 1999. Supplier selection, monitoring practices, and firm performance. *Journal of Accounting and Public Policy*, 18, 253-281.
- KARIMI, S., PAPAMICHAIL, K. N. & HOLLAND, C. P. 2015. The effect of prior knowledge and decision-making style on the online purchase decision-making process: A typology of consumer shopping behaviour. *Decision Support Systems*, 77, 137-147.
- KOHLI, A. 1989. Determinants of influence in organizational buying: a contingency approach. *The Journal of Marketing*, 50-65.
- LAFFONT, J.-J. & MARTIMORT, D. 2009. *The theory of incentives: the principal-agent model*, Princeton university press.
- LARGE, R. O. 2005. External communication behaviour of purchasers—effects on supplier management performance. *Journal of Purchasing and Supply Management*, 11, 28-41.
- LEJEUNE, M. A. & YAKOVA, N. 2005. On characterizing the 4 C's in supply chain management. *Journal of operations Management*, 23, 81-100.
- NARASIMHAN, R. & DAS, A. 2001. The impact of purchasing integration and practices on manufacturing performance. *Journal of Operations Management*, 19, 593-609.
- NEU, W. A. & BROWN, S. W. 2005. Forming Successful Business-to-Business Services in Goods-Dominant Firms. *Journal of Service Research*, 8, 3-17.

- NUNNALLY, J. C. & BERNSTEIN, F. 1994. Psychometric theory. *New York: McGraw-Hill*.
- REINARTZ, W., HAENLEIN, M. & HENSELER, J. 2009. An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of research in Marketing*, 26, 332-344.
- ROBINSON, P. J., FARIS, C. W. & WIND, Y. 1967. *Industrial buying and creative marketing*, Allyn & Bacon Boston, MA.
- ROTTMANN, S., GLAS, A. H. & ESSIG, M. 2015. Procurement process of professional services: A case study of legal services. *International Journal of Information, Business and Management*, 7, 144-162.
- SOBEL, M. E. 1982. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological methodology*, 13, 290-312.
- STANLEY, L. L. & WISNER, J. D. 2002. The determinants of service quality: issues for purchasing. *European Journal of Purchasing & Supply Management*, 8, 97-109.
- TOUBOULIC, A. & WALKER, H. 2015. Love me, love me not: a nuanced view on collaboration in sustainable supply chains. *Journal of Purchasing and Supply Management*, 21, 178-191.
- VAN DER VALK, W. & ROZEMEIJER, F. 2009. Buying business services: towards a structured service purchasing process. *The Journal of Services Marketing*, 23, 3-10.
- VAN DER VALK, W., WYNSTRA, F. & AXELSSON, B. 2009. Effective buyer-supplier interaction patterns in ongoing service exchange. *International Journal of Operations & Production Management*, 29, 807-833.
- VAN POUCKE, E., MATTHYSENS, P. & WEEREN, A. 2016. Enhancing cost savings through early involvement of purchasing professionals in sourcing projects: Bayesian estimation of a structural equation model. *Journal of Purchasing and Supply Management*.
- VAN WEELE, A. J. 2009. *Purchasing and supply chain management: Analysis, strategy, planning and practice*, Cengage Learning EMEA.
- WAGNER, S. M. 2008. Cost management practices for supply chain management: an exploratory analysis. *International Journal of Services and Operations Management*, 4, 296-320.
- WYNSTRA, F., AXELSSON, B. & VAN DER VALK, W. 2006. An application-based classification to understand buyer-supplier interaction in business services. *International Journal of Service Industry Management*, 17, 474-496.
- YOUNG, J. A. & VARBLE, D. L. 1997. Purchasing's performance as seen by its internal customers: A study in a service organization. *International Journal of Purchasing and Materials Management*, 33, 36-41.
- ZABLAH, A. R., BROWN, B. P. & DONTU, N. 2010. The relative importance of brands in modified rebuy purchase situations. *International Journal of Research in Marketing*, 27, 248-260.
- ZHANG, M., ZHAO, X., LYLES, M. A. & GUO, H. 2015. Absorptive capacity and mass customization capability. *International Journal of Operations & Production Management*, 35, 1275-1294.