Inter-functional integration and effects on purchasing and supply management – a social exchange perspective

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Abstract
We take a group-behavioral approach to evaluate the relationship between purchasing integration and other corporate functions and the resulting operational performance. Utilizing an empirical study of 247 cases we show that a trustful atmosphere, based on social and behavioral influences, moderates the integration-performance relation.

Keywords: Inter-functional integration, collaboration, group-behavior

Introduction
Purchasing and Supply Management (PSM) has grown in importance in the business world recently, reflecting factors such as the consolidation of industrial sectors in the light of a general decomposition of the value chains. Increasingly, the position of PSM within the organization is changing from a purely transactional, service delivery-focused role to one which is directly involved in and contributes to the achievement of strategic objectives.

The development brings with it new requirements for the PSM function to achieve integration in the decision-making processes of internal stakeholders and to cultivate relationships with them (Carter and Monczka 2005). Unless effective co-operation with its internal customers is achieved, PSM will be unable to meet its evolving responsibilities such as oversight and coordination of the supply chain, or deliver added value to the organization (Rozemeijer 2000).

This study is intended to address robust empirical data to achieve understanding of the different dimensions of inter-functional integration between PSM and its internal customers, as well as their effects on operational performance. It will focus on the internal buyer-supplier relationships between PSM and other organizational functions and examine the impact of different levels of integration on PSM performance. Thereby, the research approach chosen is strongly based upon social exchange theoretical perspectives (Homans 1958), since it is shown that transaction cost theory (Williamson 1975) alone does not suffice to explain the effects of intra-organizational coordination and integration on the level of the actors involved. The main research question which the study will address is as follows:

To what extent do improved social relationships with internal customers influence the relationship between inter-functional integration and operational PSM performance?

Behavioral operations management and relationship marketing

Operational Management (OM) literature continues to be strongly influenced by normative-mathematical or "perfect world" models, which use deterministic assumptions such as "un-bounded rationality" and "opportunistic behavior" to explain human actions. These relatively simplistic approaches require that people are deterministic, predictable, and uninfluenced by emotions (Boudreau et al. 2003). However, this discipline characteristic does not incorporate considerations of the human "foibles" which form the human deviations from normative theory (Loch and Wu 2007). Fundamentally, analytical approaches in OM studies are often based upon the assumption that individuals are not influenced by the actions in their surroundings and do not react to them (Bendoly et al. 2006). Consequently, OM explores singular decisions, independent of influences exerted by other actors in the enterprise.

In reality, however, decision-making is influenced by the feelings of the actors concerned, as well as by socially-determined aspects of behavior which fall outside the scope of OM's normative assumptions (Bendoly et al. 2006). As Loch and Wu (2007) argue, besides the aspects of cognitive limitations, the study of decision-making and co-operation must incorporate the consideration of the extent of bias caused by the influence of emotion and of culture (Powers and Reagan 2007).

A corresponding development occurred within the Marketing discipline, formerly dominated by the transactional perspective. The transactional view of marketing was increasingly challenged as researchers observed that business benefits often result from the cultivation of strong relationships with external suppliers (Håkansson 1982, Morgan and Hunt 1994). Proponents of the Relationship Marketing (RM) perspective view selling activities not as discrete transactions but as reciprocal and interdependent in nature. They argue that relational exchanges can be analyzed usefully in terms of the attributes normally used to describe inter-personal relationships, such as co-operation, mutual understanding, trust and commitment (Dwyer et al. 1987, Håkansson 1982; Proença et al. 2008). Consequently, any research in the field of RM typically explores dyadic relationships between customers and suppliers. This perspective has been applied not only to external relationships with other companies but also to the internal relationships between functions or departments (cp. Homburg and Jensen 2007).

In the light of the above it can be seen that Behavioral Operations Management (BOM) research and Relationship Marketing research should have close similarities. Both of these research fields could investigate the impact of social influences on interactions and acknowledge that decision-making does not happen in isolation. Furthermore, both could be informed by Social Exchange Theory (SET) (Blau 1964, Homans 1950) which combines psychological and sociological perspectives to describe and predict human behavior in relationships. Within BOM research, so far SET is used to explain aspects of behavior in exchange interactions and decision-making (Charvet and Cooper 2011, Griffith et al. 2006, Li et al. 2008, Narasimhan et al. 2009).

From transaction cost theory towards social exchange theory

In practice, PSM is typically internalized within the enterprise as a dedicated central function. From the perspective of transaction cost theory this is the most efficient approach due to high task specificity, high frequency of transactions, strong interdependencies with other departments and high risks of actor opportunism associated with purchasing tasks (Williamson 1975).

In most companies, PSM does not have any formal control over other functions because there is usually no common central authority other than at CEO and Board of Management level. Therefore, co-ordination cannot be achieved based on direct supervision by the purchasing func-

tion. As a result, decision-making is usually delegated and decentralized in functionally specialized organizations, to make most effective use of specialist knowledge and expertise in the various intra-organizational functions (Herzberg 1974).

This decomposition of the value chain into functional units in terms of organizational differentiation (Lawrence and Lorsch 1967) results in interdependencies between specialized functions and necessitates the exchange of services, information and products between them. Each function "is dependent on the performance of others, both for the accomplishment of tasks that serve as inputs or preconditions for their own specialized functions and for the ultimate attainment of common goals" (Ruekert and Walker 1987, p. 2).

As a result, internal customer-supplier relationships develop that are comparable with those in the external business world, and are maintained by the interactions of individuals and the practice of shared decision-making. A range of factors affect these internal customer-supplier relationships, such as levels of resources invested in the relationship, and behavioral aspects regarding the actors involved, such as emotions and cultural influences (Loch and Wu 2007) on the respective parties. In these lateral intra-organizational relationships, the predominant coordination mechanism is mutual adjustment (Mintzberg 1979, Weigand et al. 2003), a joint-decision making process based on interaction and bargaining between directly affected representatives of functional areas using information readily available to them (Mintzberg 1979, Walton and Dutton 1969). The actors in a relationship do not necessarily pursue the same goals or have the same expectations regarding the relationship and its outcomes. With regard to our analysis of relationships between PSM and its internal customers, this leads to situations where internal clients interpret the need for specific purchases through the prism of their functional values and place greater emphasis on product functionality or operations (Hutt and Speh 2001) than on financial savings, thereby reducing the potential impact of any PSM savings initiatives.

Observing from an organizational perspective and in terms of the transaction cost theory, mutual adjustment represents a more market-like coordination inside the hierarchy. Since the functions need to co-operate, the relationships are based upon a hybrid coordination mechanism – somewhere in the continuum between authority and market. From the perspectives of the actors involved in such internal customer-supplier relationships, however, participation in inter-functional interaction and bargaining processes is conducted solely by the individual and cannot be adequately explained by transaction cost assumptions. Since they are exposed to various behavioral influences (cp. Loch and Wu 2007), the transaction cost perspective can fruitfully be complemented by insights from SET.

The repeated bargaining and negotiation in interaction processes between the same actors are the source of the development of social relationships, as explained by social exchange theorists. "Social exchange" in essence refers to a condition in which two parties influence each other reciprocally in repeated interactions, as the actions of one party provide the incentives and rewards for the actions of the other party (Homans 1950). The essential mechanism through which SET is explained is the relational interdependence in terms of a relational contract, that develops via the interaction that takes place between exchange partners over a period of time and acts as a coordination mechanism (e.g. Dwyer et al. 1987, Hallén et al. 1991, Kelley 1983, Morgan and Hunt 1994). It is obvious that in an organization and under fixed structural conditions, repeated interactions between the same actors are observable due to the interdependencies between functions and permanently assigned roles and positions, so that the interactions and inter-functional decision-making are affected by social exchange (Lawler and Yoon 1993). In the process of mutual adjustment such social exchange is based on give-and-take between the actors involved

(Blau 1964) and facilitates the coordination of the inter-functional co-operation (Dwyer et al 1987, Hallén et al. 1991, Kelley and Thibaut 1978, Kelley 1983).

Research model and hypotheses development
Our goal for this study is to investigate how social relationships positively impact inter-functional interaction and decision-making processes, as well as their performance outcomes. Therefore, 'Operational Performance' is the first element included in this research model in order to represent the outcome of inter-functional relationships. The units of analysis in our study are PSM's internal relationships with internal key customers.

Resource ties are a specific aspect of relationships that have a significant impact on outcomes and refer to the fact, that the resources of an actor can be more or less specifically adapted to the requirements of the other party and to better access their resources (Ford et al. 2003, Gadde and Snehota 2000). Typically, a lot of time is spent at the beginning of a relationship in an attempt to learn the counterpart's processes, attitudes and requirements. Therefore, adaptations are regarded as investments. PSM is dependent on the resources of internal customers. These resources include information about purchasing requirements as well as the internal customers' functional expertise necessary to specify purchasing requirements and evaluate the technical aspects of supplier quotes. As a result, PSM adapts to the needs and requirements of these customers (e.g. Carter and Narasimhan 1994, Sánchez-Rodríguez and Martinez-Lorente 2004) through an internal key account management program. Of particular interest to the current study is the finding that in a close relationship, the adaptations or adjustments made by one actor are complemented by the adaptations of the other actor (cp. Hallén et al. 1991). To address this, the concept of 'Adaptation' is included in the research model, defined as the extent to which PSM's internal customers invest in their relationship with PSM and adapt their processes accordingly.

There are activity links when actors establish connections between their respective activities and decision-making processes in order to facilitate co-operation (Ford et al. 2003). The resultant links are related to the exchange of products and services, the exchange of information, as well as communication between the exchange parties (Håkansson and Snehota 1995). The respective state of inter-functional integration has been explained in the literature in terms of the dimensions 'Interaction' and 'Collaboration' (Chen et al. 2010, Ellinger et al. 2000). Interaction refers to formal communications and information exchange between functions (Griffin and Hauser 1992, Prior 2012, Ruekert and Walker 1987). Collaboration empowers lower management levels to work with other departments and is, therefore, related to decentralized authority (Kahn and Mentzer 1998).

The development of activity links involves investments and combinations of resources which represent the resource ties (Ford et al. 2003). Therefore, the extent to which adaptations are made in the relationship increase interaction and the degree of collaboration which are hypothesized as follows:

H_1 - *The extent of adaptations made has a positive influence on both, interaction*
(H_{1a}) and collaboration (H_{1b}), between these functions.

The degree of interaction and collaboration between the parties in a relationship has positive effects on performance (Kahn 1996). Effective and efficient communication between actors in a relationship reduces errors with regard to products, services and performance and thereby it improves cost structures, quality and delivery (Dyer 1996, Paulraj et al. 2008). Through inter-functional collaboration, the diversity of knowledge resources that have the potential to be applied to the decision-making process get multiplied (Grant 1996, Narasimhan et al. 2010). There-

fore, research suggests a positive performance influence of both, interaction (Maltz and Kohli 1996, Pandey et al. 2010) and collaboration (Fredendall et al. 2005, Lawrence and Lorsch 1967):

H_2 - *The degree of interaction between the functions has a positive effect on operational performance*

H_3 - *The degree of collaboration between the functions has a positive effect on operational performance.*

Another factor that affects the exchange relationship between the parties is the set of subjective social aspects or actor bonds. Actor bonds bind the exchange actors closely as they develop through emotions and the influence of socio-cultural interactions (Han 1992). Actor bonds describe the depth and climate of a relationship (Johnson 1999) which has been discussed using the terms "relationship quality" (e.g. Nyaga and Whipple 2011) or "relationship atmosphere" (e.g. Håkansson 1982, Sutton-Brady 2000). The term 'Relationship Atmosphere' will be used from now on and is defined as the overall state or quality of a relationship, in terms of the degree of dependence, trust, commitment, satisfaction, mutual understanding and absence of conflicts among the actors (cp. Håkansson 1982, Sutton-Brady 2000).

Repetitive negotiation of exchanges in a dyad reinforces the perception of interdependence and thereby endorses "psychological group formation" and commitment (Lawler and Yoon 1993). Co-operative behaviors of individuals result from subjective cost-benefit analyses and the comparison of alternatives (Homans 1958). Hence, the individual behavior of each actor is determined by his anticipation of possible rewards or penalties for his behavior meaning an exchange will take place only if the cost-benefit expectations of both parties are likely to be met (Homans 1950). Moreover, the strengthening effect of payoffs from an exchange increases the gratification with the relationship which is often supposed taken as a source of such satisfaction (Homans 1950). Especially in situations when a goal is achieved in congruence with another actor, e.g. in mutual decision-making or negotiating agreements, such positive feelings are experienced (Izard 1977, Lawler and Yoon 1993). This in turn encourages the actors to remain within the relationship (Meyer et al. 1990) and thereby forming commitment to the relationship (Leik and Leik 1977). Therefore, and because social exchange is recognized as a governance mechanism for a relationship (Blau 1964, Homans 1958, Lawler and Yoon 1993, Powers and Reagan 2007), it is hypothesized that:

H_4 - *The relationship atmosphere moderates the performance impact of interaction (H_{4a}) and collaboration (H_{4b}).*

Figure 1 shows the described hypotheses structure and the following measurement models.

Methodology and data analysis

We designed a survey questionnaire as per the findings gathered from available literature. Before the commencement of the main survey, the questionnaire was duly pre-tested for content validity.

Our measures for 'Adaptation' are based on Brennan, Turnbull, and Wilson (2003) and Nielson (1996). The adaptation scale is measured in a reflective way and addresses the degree to which process adaptations and investments in the relationship are made (Gadde and Snehota 2000). The measures for 'Interaction' and 'Collaboration' are based on Kahn's (1998) bidimensional measurement of 'interdepartmental integration'. Interaction puts emphasis on the formal exchange of information between departments or functions, i.e., meetings, phone calls and emails (Griffin and Hauser 1992, Kahn 1996, Prior 2012, Ruekert and Walker 1987). Collaboration emphasizes team work, the achievement of common goals, and involvement (Chen et al. 2010). Both constructs are measured reflectively. We used the reflective scale developed by

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Sutton-Brady (2000) to measure the 'Relationship Atmosphere' which addresses the overall state or quality of a relationship (cp. Ford et al. 1996, Håkansson 1982).

Internal consistency is given for all four reflective constructs. Cronbach's α values range from 0.89 to 0.93 which are well above 0.60 as the recommended cut-off value (Churchill 1979). For the composite reliability values similar results were obtained (0.92–0.95). All of them were above the suggested cut-off values of 0.60 (Bagozzi and Yi 1988). Indicator reliability is given too. As Figure 1 shows, all measures of the reflective constructs' outer loadings, with the exception of the second item of the relationship atmosphere measure, exceed the recommended minimum value of 0.707 (Chin 1998). Regarding convergent validity, the average variance extracted (AVE) ranges from 0.65 to 0.82 and therefor is above the recommended value of 0.5 (Chin 1998, Fornell and Larcker 1981). Last but not least, discriminant validity is given, as the square root of average variance extracted is higher than the correlations between the constructs (Fornell and Larcker 1981). In sum, all our reflective measures are reliable and construct validity is proved.

'Operational Performance' could be measured in many ways and no standardized direct measuring method has been adopted or even devised so far (Fugate et al. 2010). The effects of PSM performance are measured using a multidimensional approach reflecting the various objectives of PSM rather than by merely concentrating on financial performance (e.g. Flynn et al. 2010). We have utilized the performance dimensions 'cost', 'time', 'quality', 'flexibility', and 'contribution to innovations', to measure the extent of operational performance (Burt et al. 2012). In order to give consideration to the multidimensionality of performance, PSM performance is the only formative measure in our research model.

Test procedures intended for reflective operationalization cannot be directly applied to formative constructs (Bagozzi and Yi 1994, Rossiter 2002). Common Reliability tests are not suitable because positive correlations between the indicators are not imperative (Bollen and Lennox 1991, Diamantopoulos and Winklhofer 2001). In order to evaluate validity, we follow the suggestion of Henseler et al. (2009): With the only exception of the quality performance item (-.01; t-value .131), the outer weights values range from .27 (t-value 2.222) to .35 (t-value 3.204) and are well above the recommended cut-off value of 0.20 (Chin 1998) and are supported by sufficient t-values. Multicollinearity is not an issue, as the variance inflation factor for all the indicators is < 1.801 and thereby below the commonly accepted cut-off value of 10 (Diamantopoulos et al. 2008). In sum, also our formative measures are reliable and valid.

We selected a random sample of 1,000 Chief Purchasing Officers (CPOs) from European companies in production and service industries. We restricted the sample to senior PSM managers because this group is expected to be in a better position to inform about the purchasing practices and the actual performance of their organizations (Sánchez-Rodríguez and Martinez-Lorente 2004). Out of the original 1,000 mails we sent out 290 questionnaires were completed and returned, of which 247 were useable. 72.4 percent of our respondents had been PSM executives at the level of chief purchasing officer or director in their respective organizations. No non-response bias could be found (e.g. Armstrong and Overton 1977).

For the analysis of our survey data we have chosen the variance-based structural equations modeling (SEM) approach of partial least squares (PLS) (Chin 1998, Henseler et al. 2009). Compared with conventional covariance-based techniques such as LISREL, PLS estimates the individual path coefficients more conservatively and does not require normal distribution of data (Bagozzi and Yi 1994, Chin 1998). We utilized SmartPLS version 2.0 (Ringle et al. 2005).

PLS does not use fit indices as covariance-based techniques such as LISREL do. Instead, a good model fit is assumed when path coefficients are significant, and the R^2 values are accept-

ably high (Gefen 2000). According to Chin (1998), the R² values of all our latent variables are substantial (see Figure 1). We used the PLS bootstrapping procedure's t-statistics to test for significance of the latent variables inter-relationships. We can conclude from the results of this analysis that the model fit is sufficient and the effects and predictive power are solid.
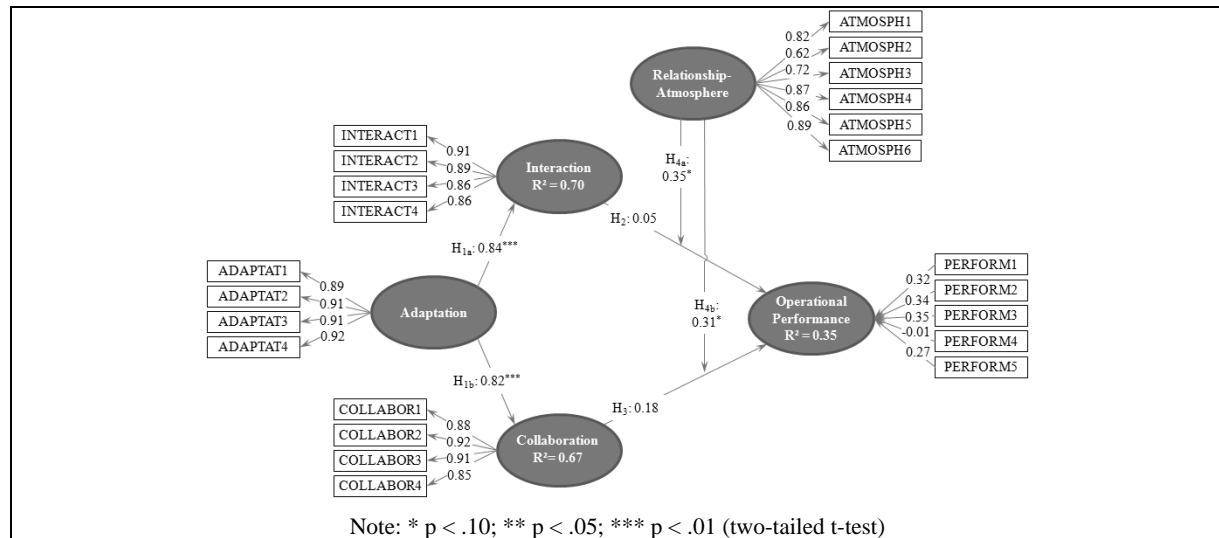

Note: * p < .10; ** p < .05; *** p < .01 (two-tailed t-test)

Figure 1 – Results of analysis

Discussion, contribution, and implications

The empirical data provides evidence that the extent of adaptation has a strong and highly significant impact on interaction (0.84) and collaboration (0.82). Therefore, hypotheses H_{1a} and H_{1b} are both confirmed.

In line with earlier research (Kahn 1996, Kahn and Mentzer 1998, Troiloa et al. 2009), we could not confirm a direct impact of interaction on operational performance (0.05; H_2). Though the direct impact of collaboration on operational performance (0.18) is stronger than the interaction-performance effect in terms of its path weight, it is not significant at the 0.1 level either. Therefore, H_3 could not be confirmed too, which is surprising since earlier research usually confirmed this relationship and often posited that the performance impact of collaboration was stronger than the performance impact of interaction (Fisher et al. 1997, Kahn 1996, Maltz and Kohli 1996, Troiloa et al. 2009). With these results, our study supports the research results of various study that raised doubt about a general positive impact of inter-functional integration and operational performance (e.g. Ellinger et al. 2000, Gimenez and Ventura 2005).

However, 'Relationship Atmosphere' is strong enough to cause a moderating effect that result in a substantial and significant influence for both the interaction-performance relationship (0.35) as well as the collaboration-performance relationship (0.31). Hence, we could confirm H_{4a} and H_{4b}.

The aim of our study was to investigate to what extent social exchange aspects influence the direct impact of inter-functional integration on performance success. Indeed, we found that the integration-performance relationship is strongly influenced by social exchange aspects. The formal exchange of information (interaction) or collaboration alone does not have significant impact on performance success. Only under the conditions of social exchange do these relationships become vital. In fact, the stronger the social relationships in terms of a relationship atmosphere, the higher the impact of interaction and collaboration on operational performance.

Interestingly, in their study, Kahn and Mentzer (1998) already highlighted the importance of social aspects, such as mutual understanding, goodwill/commitment, and satisfaction in working together, for the collaboration-performance impact even though they have not explicitly inserted a social dimension into their research model. We could now show that such social aspects are indeed important for the analysis of integration-performance relations.

Practical implications are two-fold: First, managers should foster adaptations towards the exchange partner which improve the coordination of the relationship. Such adaptations represent resource ties and facilitate the development of activity links based on information exchange (interaction) and collaboration. Second, managers of internal suppliers should ensure that a positive relationship atmosphere exists in the relationship of their organization with its internal customers. Perceived mutual understanding and dependence, trust, satisfaction, commitment and the absence of conflicts enable the activity links in the relationship to show to advantage their positive influence on operational performance.

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