

Analysing Challenges of Collaborative Supply Chain Strategies in the Environment of Cross-Company Networks

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Abstract

A large number of cross-company network collaborations fail to get their intended effect due to wrongly designed organisation form and business relationship aspects. This was the motivation to establish the project "Organisational concepts for the planning and control of supply chains" within the Collaborative Research Center 559: Modelling of Large Logistics Networks. (SFB559 2006), working on the relationship of organisation forms to the supply chain management (SCM) strategies in a cross-organisational network, in order to reach aspired enterprise and network costs as well as performance goals. SCM strategy in this context is understood as a collaborative inter-enterprise strategy e.g. vendor-managed inventory or supply chain monitoring. The implication for collaborative SCM strategies and their impacts on the companies in the network are analysed. The aim of the project is to create procedures for the implementation of SCM strategies in cross-organisational networks and consequently to facilitate the collaboration in such networks. To do so, the research project aims at developing four frameworks, in order to describe, explain, predict and design organisation forms and SCM strategies. The first result, namely a description framework, will be presented in this paper. The main literature, addressed within this field of research is organisation management, logistics management and supply chain management.

The development of the frameworks have partly used different research methods. To develop the description framework, conceptual literature was use on the one hand and existing results of empirical management research on the other hand.

In order to develop the description framework the requirements on the description framework for the implementation of SCM strategies in a network were examined. The classification of those requirements in three building blocks, namely SCM strategies, intra-company and inter-company organisation, enables a closer observation of the challenges of SCM strategies implementation. Additionally, different organisation forms for SCM strategies implementation are researched and classified. Moreover, approaches of organisation theories, such as system theory, resource-based theory, principal-agent theory, transaction theory, incentive theory and the IMP model are discussed and checked in respect of the requirements. Hereby it can be seen that the IMP model (IMP Group 1990) presents a broad basis for the description of a supply chain. The extension of the IMP model by the specific content of the building blocks enables a comprehensive description framework. In the research we figured out that the interaction of the aspects of three different organisation theories - system theory, resource-based view and principal-agent theory - complete the description framework. The requirements and the research of the approaches of organisation theory result in a description framework that contains three main systems: network environment, embodiment of network behaviour, players & business relationships as processes of interaction. This paper contributes to the description of problems within the implementation and application of SCM strategies in networks and complexity of network business interaction. The main contributions are: definition of requirements for the implementation and application of collaborative SCM strategies in a network, creation of composition of organisation theory approaches to describe the requirements, creation of a final description framework for the discussion of SCM strategies and supply chain.

Keywords: Supply Chain Organisation, Organisation Forms, Supply Chain Management, SCM strategies.

Introduction

Increasing customer expectations, short product life cycles, new information and communication technologies as well as global procurement markets force companies to reconsider their strategies in a supply chain. Companies optimise their own product costs and quality as well as customer oriented targets like delivery time with strategic decisions. However, the enterprise's internal optimisations are already in utilisation, but still not sufficient to satisfy the requirements of the end consumer. That can be observed in different industries. For example an automotive original equipment manufacturer produces a customer car in 1.5 days. The fact that the end consumer gets his car, depending of the car model, approximately 3-4 months, after that is caused by the inefficient cross-company interface organisation. (Holweg and Frits 2004). Supplementary, in the high tech industry, companies like Dell produce a final customer's order in 5 hours. But before cross-company interface optimisation (introduction of SCM strategies), the end customer had to wait 7 weeks to obtain the ordered product. After the implementation of appropriate SCM strategies and organisation forms in the supply chain of Dell, the end customer gets his order in 5 days. Consequently, companies are reorganising their interfaces to their suppliers and customers in order to manage the efficient utilisation of resources on the cross-company interfaces as well as to achieve the desired network performance. The cost, time and quality benefit achieved has to be forwarded to the end consumer. For the design of cross-company interfaces, different collaborative SCM strategies can be implemented. Many SCM strategies have been developed for the requirements of specific industries. Strategies like Supply Chain Monitoring and Demand-Capacity-Planning were introduced in the automotive sector (Odette Supply Chain Management Group 2003). Another attempt to improve the cooperation between a manufacturer and a retailer is the industry standard Collaborative Forecasting, Planning, and Replenishment (Andraski et al. 2002). Some of the strategies such as Vendor-Managed Inventory were created for the retail but can also be used in other industries than those of the automotive sector. However, mainly the design of interfaces and the application of SCM strategies prove to be particularly complex. According to empirical studies, the introduction of SCM strategies fails regarding their intended effect, due to: improper organisation forms, inconsistent operational goals among the involved organisations, lack or different levels of trust. (Schnetzler 2005; Bachmann and Lane 1999; Bock 2003). Organisation forms not adapted to the SCM strategies prohibit the achievement of the aspired objectives of collaboration. Accordingly, SCM strategies are implemented on the basis of the existing organisation forms that are too inflexible in order to enable new strategy processes. The distrusting attitude and inconsistent goals, not customised to the specific partners cause a hesitant sharing of information and put the implementation of SCM strategies at risk.

To meet those challenges, the project "Organisation concepts of supply chains" was created as a part of SFB 559 "Modelling of large logistics networks" at the University of Dortmund, Germany. The target of this project is the investigation, explanation, development and evaluation of organisation forms, realising strategies for the planning and execution of supply chains, in order to improve the collaboration of the supply chain partners and the supply chain costs and performance. The appropriate organisation form for collaborative SCM strategies will in the long run enable the partners to obtain lower costs as well as flexibility within the own company and along the supply chain. Consequently, the question arises which organisation form is suitable for which SCM strategies or respectively which SCM strategies can be implemented when a certain organisational form is already given. To analyse these challenges, the project is working with four different analysis frameworks: description (describing all relevant aspects of application of SCM strategies and organisation forms), explanation (explaining the coherence between SCM strategies and organisation form), prediction (combination of SCM strategies and organisation forms and its effects) and finally decision framework. The objective of a decision framework is to support a company in the implementation of collaborative SCM strategies, elaborating a recommended implementation proceeding for the companies.

At the beginning of the paper current trends in supply chain management, the SCM strategies and their classification will be explained. Following that, the paper will present different organisation forms, found in industrial applications, but also stemming from organisation theory. Those organisation forms will be evaluated as to their suitability in respect of the SCM strategies. After the SCM strategies and different organisation forms have been presented, the contribution of organisation theory to the description framework will be discussed. The description framework integrates all relevant aspects in the application of SCM strategies and appropriate organisation forms, in a company itself as well as between different companies.

Collaborative SCM strategies

In general, strategies comprise the goal-oriented proceeding as well as the long-ranged planning in contrast to short-dated tactics that form part of strategies. (Seuring et al. 2003; Grass 2000; Church and Ware 2000) From a company's point of view, there are different types of strategies. In order to locate the effects implementing collaborative SCM strategies, different company strategies and finally the location of the collaborative SCM strategies in company strategies will be discussed. The companies' strategies can be classified into the following levels (Homburg and Krohmer 2003): On the **enterprise level**, the long-term business objectives are determined. By means of the competitive strategy the company defines, in a more generalised form, which products and services are to be offered in which markets. According to Porter (Porter 1999) two main strategies exist. With **cost leadership** the company aims at providing its products and services at a price as low as possible in comparison to competitors. In contrast, by means of the **strategy of differentiation**, a company seeks to stand out from the competition by unique product and/or service characteristics. On the **enterprise operation level**, the competitive strategy is realised through functional strategies within the different functions of a business unit, such as human resource management, accountancy, procurement, logistics, production, distribution as well as research and development.

Based onto the above classification, **SCM strategies** can be defined as the sum of collaborative processes (Lambert 1998) that are implemented intra-organisationally as well as inter-organisationally on the functional level of the partners in a supply chain. Further on, the competitions strategies (Porter 1999) on the enterprise level with its goals influence the design of the collaborative SCM strategies. The SCM strategies can be described through the related decision objectives, the coordination level, the properties of the exchanged information and the related tasks. (Witthaut and Hellingrath 2003) Additionally, the introduction of SCM strategies affects many functions of a company (logistics, production, purchasing, etc.), depending on the processes of the SCM strategies. The implementation of SCM strategies influences the decision rights and task distribution/allocation in the internal organisation as well as between the companies collaborating. The inter-organisation as the interface between the companies includes decision rights, task distribution and allocation just like the intra-organisation form.

Organisation forms in industry and organisations theory

Organisation forms describe different characteristics of the distribution of the decision rights as well as the distribution of tasks and their allocation. (Picot, Dietl and Franck 1997) The introduction of SCM strategies in supply chain goes with new organisation forms that are to implementate in the companies' existing organisations forms. Thus, in recent years, a multitude of network-based enterprise organisation forms have been discussed. (Pfohl 2004) The classification of the organisation forms is versatile. On the one hand the organisation forms used in the industry, such as joint venture, keiretsu, group, profit centre and project organisation form can be found, on the other hand there are organisation forms discussed in the management science (organisation theory), e.g. virtual organisation, 4th party logistic service provider, lean organisations, staff organisations and so on. Further on some of the organisation forms can be used for intra-organisation or inter-organisation collaboration and some of them for both. Generally we can state that those new organisation forms are derived from basic organisation forms such as functional, matrix and divisional organisation form. Those "old" organisation forms have a different design in respect of the centralisation of the decision rights and their task distribution.

In order to research and analyse the suitable organisation forms for SCM strategies there will be a closer look at the content of the organisation forms. Going from the main content of the organisation forms, namely fixing the distribution of the decision rights and task-distribution/allocation, it can be stated that the organisation forms are either more central or decentral oriented. Centralisation includes, in opposition to decentralisation, aggregation of decision rights as well as concentrating tasks to persons or/and business units. Centralisation enables a strong employee/business unit orientation and the development of functional know-how (Pfohl 2004). On the other hand, decentralisation is a depolarisation of tasks allocation and decision authorisations from, for example, one business unit. Decentralisation contributes to a decrease of conflicts in respect of task and decision rights in a company. Within the similar tasks with its decision rights are sourced out. This is how the number of interfaces in a business unit is reduced. Consequently, the decentralisation leads to the decrease of transaction costs, as coordination and processes diminish in a business unit.

The following illustration summarises in the first place the main difference between the organisation forms (namely, focus of the organisation forms) and in the second place different organisation forms that have been worked out in respect of inter-organisational and intra-organisational applications.

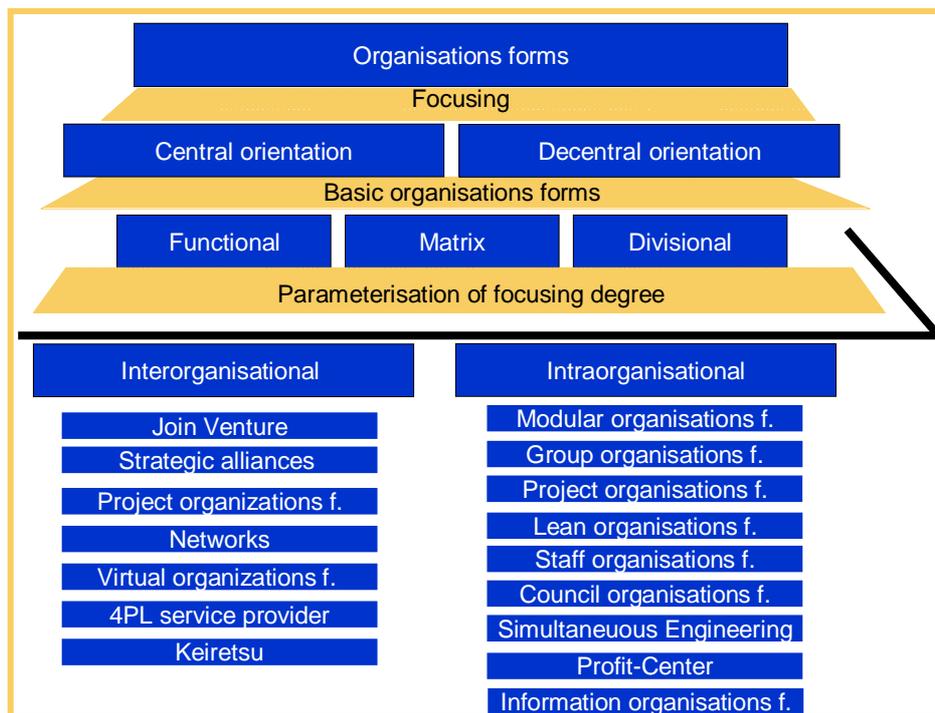


Figure 1 Organisation forms

As it can be seen in figure 1, the basic organisation forms - functional, matrix and divisional organisation form - have a different focus, namely central or decentral. Through the configuration (configuration in respect to the task distribution and decision right distribution) of those basic organisation forms, new organisation forms are created. Hereby the new organisation forms can be deployed for inter-organisation and intra-organisation relationships. Some of the organisation forms are used for both, inter-organisation and intra-organisation relationships, like the project organisation.

To create a framework which is able to describe organisation forms focusing on the implementation of SCM strategies, different factors have been worked out, to be considered in order to cover the interplay of SCM strategies and organisation. Those factors are summarised in the following chapter.

Requirements to describe organisation forms and collaborative SCM strategies

The implementation of SCM strategies requires considerable organisational changes and adaptation of processes in companies. Starting from the main challenges connected to the implementation of collaborative SCM strategies, namely: inadequate organisation form, inconsistent operation goals, lack/different level of trust (Schnetzler 2005), the description framework has to be able to describe SCM strategies, different organisation forms (intra- and inter-company) as well as influencing factors to the business relationship as trust and the other factors that are part of the business relationship. **SCM strategies** can be described in terms of their decision objectives, coordination level, information properties and process tasks. Therefore the description framework has to contain elements describing the assignment of responsibilities as well as the structure of planning and execution processes between the partners within the supply chain. In order to come to the description elements, the intra-company organisation forms have to be described in respect of the possibility of integrating the collaboration processes and the effects of these integrations on these organisation forms. In summary, the description framework has to contain elements describing **different organisation forms** and their configuration, the way these organisation forms are integrated within the company; and the integration of the collaborative SCM strategies in the organisation form. On the other hand the **inter-company organisation forms** have to be described for their ability to plan and control network processes. Furthermore, not only the inter-company configuration has to be described, as the business

relationships depend on company behavior and existing network forms in the supply chain. (Ford; Gadde; Lundgren 1998; Wagner 2002) Due to the fact that successful collaboration is based not only on coordination, but especially on motivation (Bachmann and Lane 1999; Schnetzler 2005), the aspect of motivation has to be considered and described.

Following the implementation challenges of the SCM strategies and use of adequate organisation form, the description framework has to contain three major building blocks with a number of specific elements as depicted in figure 2 (Mehicic-Eberhardt, Hellingrath and Witthaut 2005).

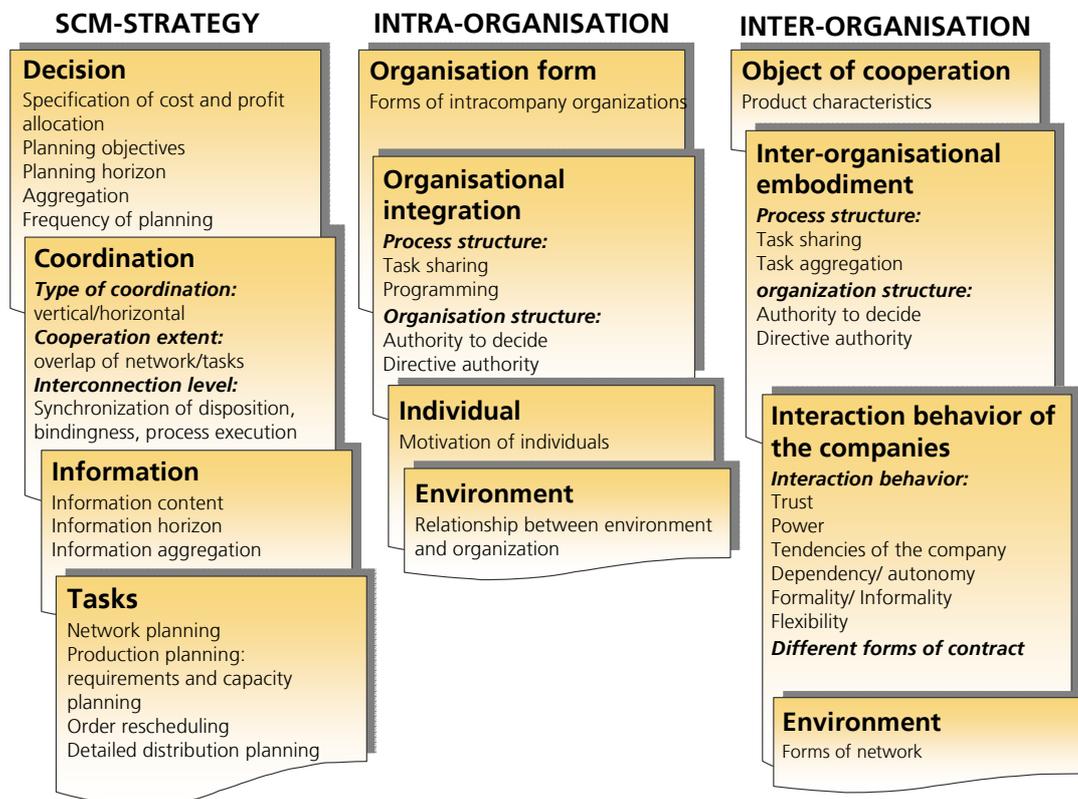


Figure 2 Requirements for the description framework

The concrete requirements on the description framework are elaborated building blocks. The building block SCM strategies contains the requirements in order to describe SCM strategies within decision objectives, coordination level, information properties and relevant tasks of the SCM strategies. The intra-organisation building block contains the requirements that describe the existing intra-organisation form. The inter-organisation building block contains the requirement that describe inter-organisation form. These building blocks should be integrated in a single description framework.

After the derivation of major building blocks and elements of the description framework, it is continued with the discussion, how an organisation theory can contribute to the description framework.

Organisation theory and its contribution to the description framework

Organisation theory is used in applied as well as in basic research in order to meet the requirements of enterprise management. (Schreyögg 1998) The organisation theory works on the one hand with specific coordination and motivations theoretical approaches (Williamson 1975) and on the other hand with decision theory. Both instruments contribute to the identification of problems within an enterprise as well as to the creation of appropriate solutions. The theoretical approaches of organisation theory describe and explain different company/employee behavior and organisation forms within and between companies as well as in respect of their market environment. (Schreyögg 1998) (Homburg and Krohmer 2003) Because of the requirements on the description framework, namely to describe the SCM strategies, intra-organisation and inter-organisation in respect of coordination and motivation, it first concentrated on the theoretical approaches to create a description framework. It was then

worked with different theoretical approaches to describe the challenges of implementation of SCM strategies in supply chains.

Contribution of selected organisation approaches to the description framework for a supply chain organisation

One empirical model and three approaches of organisation theory were identified as a basis for the description framework according to their contribution. In this context, our research concluded that there is no single theoretical organisational approach that fulfils all requirements, but each fulfills certain aspects. These approaches will be discussed and evaluated in respect to their contribution for the description framework.

The empirical **supply chain interaction model (SC-IM)** (Wagner 2002) is based upon the IMP interaction model (IMP Group 1990) that resulted from the interview of 300 enterprises from 15 different industries in 5 European countries. This model focuses on the inter- and intra-organisational design of business relations that supports especially a supply strategy. The description of the business relations within this model can be distinguished according to the following aspects: competition, cooperation, standards, opportunistic performance, power and confidence. Furthermore the factor contract constellation is described respective to the duration of the relation, unstableness, frequency of the contact. Due the fact that the companies are usually focused on their own, the environmental factors that have to be considered within this model via the description of the branch of trade, environment dynamics, market structure and position in the supply chain are of special importance. The supply strategies are to be incorporated into a business relationship. The SC-IM provides an extensive initial point in respect to the requirements of the description framework (building block) **inter-organisation** (object of cooperation, environment, interaction behaviour) on one hand through a broad description of environmental factors and on the other hand through an empirical-based focus on the business relationship. Moreover a part of the building block **intra-organisation** (namely with environment) is described with the SC-IM. A building block **SCM strategies** and with it the integration of the SCM strategies processes into **intra-organisation** forms has to be incorporated.

Working with the **system theory** under the perspective of a company as a socio-technical system allows a high level of abstraction of the coordination and motivation problem of the organisation (Grass 2000). Primarily, description of the supply chain using system theory is reasonable, given the aspects of systems and subsystems. In this way the supply chain can be treated as a system that contains a sum of subsystems, in this case companies. Furthermore, the companies contain different elements, like the organisation and the process structure. These elements are part of the company and business relationships. With the approach of system theory, the structure of the company as well as of the supply chain can be mapped. Furthermore the process structure with its different tasks and processes incorporates SCM strategies processes in a company. The organisation structure on another hand enables the description of the organisation forms. Therefore system theory partly describes the building block **intra-organisation** (organisation form, organisational integration), partly the building block **SCM strategies** (task-process structure) and partly the building block **inter-organisation** (inter-organisational embodiment). Other aspects of the building blocks like SCM strategies (decision, coordination, information properties) or inter-organisation (interactive behavior) are not included.

The **resource-based approach**, in contrast to system theory, ties in with the election, description, and coordination of appropriate resources that are needed within an organisation, in order to fulfil the purpose of the organisation. As a complement to the system theory, which gives the structure for a description framework, the resource-based view describes the content of the important resources (core competencies) in organisations and within the process structure of the company. (Seuring 2003) Furthermore, when transferring this idea to the supply chain, the company becomes an extended enterprise in a supply chain, where each participant carries out only its core competency, i.e., a core competencies oriented supply chain. (Hellingrath and Mehicic-Eberhardt 2005) The resource-based approach with its concentration on core competencies addresses the issue of the coordination of resources. (Wernefelt 1984) In addition, also the SCM strategies collaboration objects are considered, as services and products are performed, for which the companies provide core competencies in terms of resources. This proceeding also determines the services and products that are to be provided by the supply chain partners. (von Stengel 1999) Therefore the resource-based approach addresses the issue of how to identify the resources that should be used within a company and accordingly the external resources that should be used by the company. With the resource-based view, the description of the building block **SCM strategies** within decision objectives, a coordination level and

information property in an organisation as well as in a supply chain is possible. In this context the resource-based view satisfies the building blocks **intra-organisation** (process structure) and **inter-organisation** (process structure) in order to complete the description of the building block **SCM strategies**. Other aspects of those building blocks, as for example interaction behavior, environmental factors and so on cannot be described with the resource-based view. Therefore the resource-based view is not alone suitable for the project as the majority of the factors are not considered.

The **principal-agent theory**, in contrast to system theory and the resource-based view, ties the motivation of the employees involved in the business of a company. For this purpose, the subject of the principal-agent theory is the appropriate delegation of tasks and consequently the contractual design of the relation between principal and agent. Furthermore the contractual design of SCM strategies and of relationships between companies can be described. The principal-agent theory concentrates on the contractual relation of two players. Hereby it deals - under the aspect of motivation - with the question of work delegation, specialisation and barter respectively reconciliation (Picot, Dietl and Franck 1997). Also the factor of interaction behavior is addressed by the aspect of contract constellations. Moreover, interaction behavior is dealt with under the aspects of exchanged information, contract specifications and conflict behavior of players. In doing so a one-sided description of the principal can be found where the opportunism of the principal is not considered (Perrow 1986). Concerning their risk behavior, neutrality is supposed for the principal and aversion to risks for the agent. However, the content of the principal-agent approach contributes to the description of the contractual situation between companies and between a company and its employees. Because of this, the principal-agent theory can be used to describe the part of the building block **intra-organisation** (individual) with delegation of tasks as well as motivation to accomplish these tasks. In addition, the principal-agent theory contributes to describing the building block **inter-organisation** (interaction behavior of companies). The descriptions of the building block **SCM strategies** as well as other aspects of the building blocks **intra-** (organisations form, organisation integration and environment) and **inter-organisation** (object of cooperation, inter-organisational embodiment, environment) are not considered. As some requirements are not addressed, the principal-agent theory is not alone suitable as a description framework for the project.

The empirical model described above and the three approaches of organisation theory cover certain requirements of the description framework for the challenges of the SCM strategies. In the next chapter we will integrate relevant aspects of those approaches into the description framework.

Description framework for the analysis of SCM strategies

The maxim of this chapter is to take the relevant aspects of the different approaches described in order to create the description framework. Each of the organisation theories as well as IMP model contains only certain aspects of the building blocks, but jointly they fulfil all requirements and are able to describe the building blocks. We assume a model with two companies for the description framework. In a later work the results will be extended to companies forming an entire network. The requirements on the description framework, namely to describe the building blocks: **SCM strategies** (decision, coordination, information and task), **inter-organisation** (organisation form, integration, individual, and environment) and **intra-organisation** (object of cooperation, inter-organisational embodiment, interaction behavior and environment) using relevant aspects of the different approaches for the description framework.

The description framework assumes the modelling of two companies and their business relationships, e.g. as a supplier and a customer. It is further assumed that those companies are operating in a specific embodiment of supply chain behavior, which includes a certain level of distribution of trust/power and, also of dependency and expectations. The supply chain environment (characteristics of industry sector, type of network and network topology) is given. This rough structure of the description framework is based on the empirical based SC-IM. (Wagner 2002) The internal structure of the two companies and business relationships is based on the system theory. The business relationships are described as an own subsystem, because of their complexity (Ford; Gadde; Lundgren 1998) which can be structured into process and organisation. The process structure describes tasks, their distribution as well as the process flow. The organisation structure is defined by the number of hierarchy levels within the different organisation forms, roles distribution, decision rights as well as directive authority. Both, process and organisational structure can obtain a different design. For example, regulations may contain general rules in respect to exception handling, but also general rules in respect to individual behavior in a company. In summary, there are two different systems,

namely supply chain environment as the supersystem of the system embodiment of supply chain behavior, see figure 3. In the system embodiment of supply chain behavior, we can find above described subsystems, namely two companies and their business relationships, see figure 3.

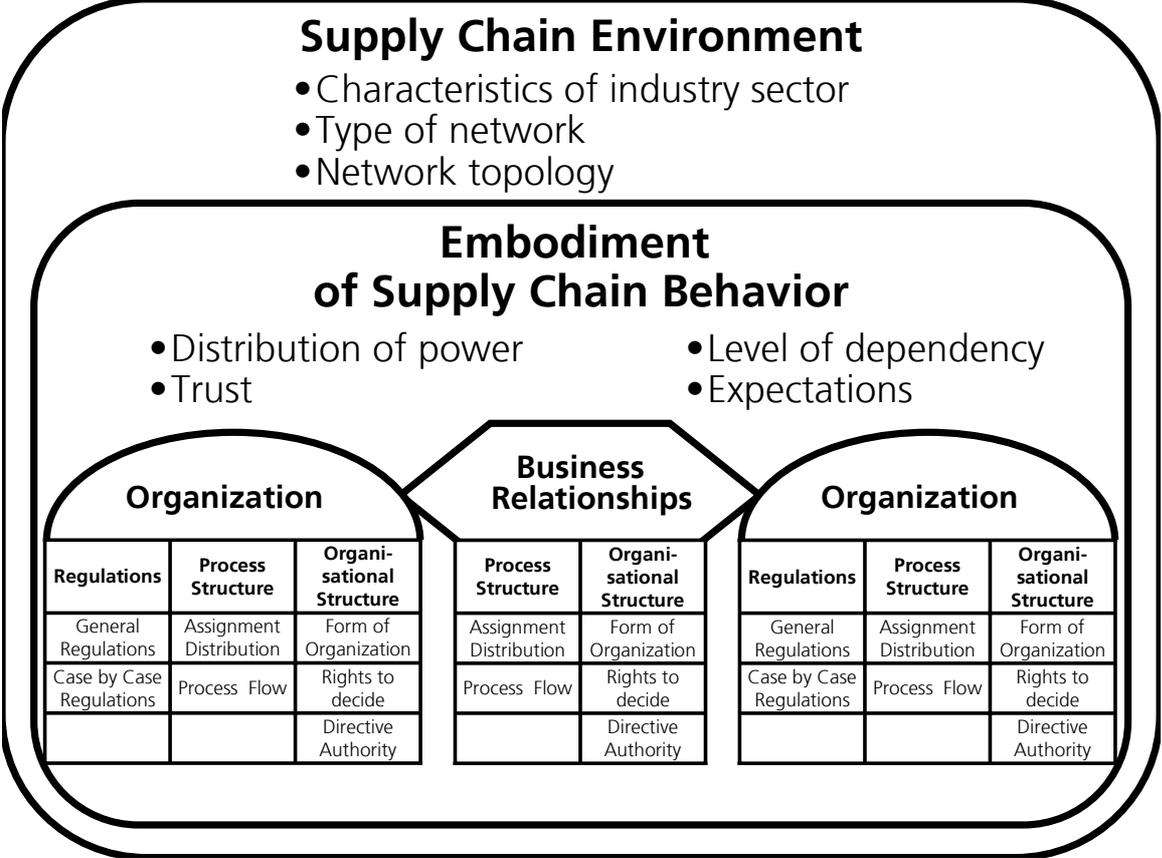


Figure 3 Description framework

The description of the building blocks **SCM strategies, intra-organisation and inter-organisation**, will be done using contributions of **SC-IM, system theory, resource-based view and principal-agent theory**. The contribution of those theoretical approaches and empirical model is to be found in different components of the description framework:

Supply chain environment assumes that the environment affects the relations of inter-company exchange. Here the characteristics of the industry sector, type of network, as well as network topology are essential when choosing SCM strategies and interaction relationships. In particular these contain industry-orientated aspects and structural conditions of networks. Consequently the main description building block is the **inter-organisation** using contributions of SC-IM.

Embodiment of supply chain behavior describes the given distribution of power, the level of dependence, trust and the expectations of the partners that participate in the process of interaction. These factors can develop in different levels which determine the working climate in and between companies. The existence of these factors and their levels of embodiment are going to play a special role concerning the assignment of responsibilities. Therefore attention will be paid to one of the most important factors of cooperation in networks and its control: trust and power. Therefore the main description building block is the **inter-organisation** using contributions of SC-IM and principal-agent theory.

Companies (Organisations). The differentiation between companies, which participate in the process of interaction, substantiates the assignment of responsibilities to organisation forms. The behavior and the performance of a company organisation and the assignment of responsibilities in the process of interaction are marked by the organisational goals, structures and strategies as well as the technological abilities of the company. In turn behavior and performance of the individual contribute, through his personal aims and experiences, to the process of interaction. Therefore on the one hand the organisation forms and their integration, process structure and on the other hand the individuals are observed for the implementation of SCM strategies. Thus the main focus is the description of the

building blocks **intra-organisation** and **SCM strategies** with contribution of system theory, resource-based view and principal-agent theory.

Business Relationships contain the process of interaction between companies (Ford; Gadde; Lundgren 1998) that includes a product specific interaction strategy. In order to identify the form of the interaction process and its length, the characteristics of the collaboration object, namely of the product or service have to be discovered. These could for example be demand plans, frequency of purchase, standardisation of the product, the complexity of the product or the product requirements. By means of these characteristics it has to be found out whether a strategic product is concerned or not. This is of importance for the interaction process, determining its form and length. The interaction strategy is defined on the one hand by the description of the behavior of interaction – restraint, competition or collaboration – and on the other hand by the means of the SCM strategies. Both aspects of interaction strategy are describing different patterns of relationship which can also be found on the level of information exchange e.g. being voluntarily or even contractually obligated. Product characteristics, interaction behavior and interaction strategy on the one hand affect the SCM strategy to be chosen and on the other hand the choice of a suitable organisation form. Consequently, the main focus in the business relationships are partly the building blocks **intra-organisation**, **inter-organisation** and **intra-organisation SCM strategies** with the contribution of system theory, resource-based view and principal-agent theory.

In summary, the resource-based view and principal-agent theory are used to supplement the description of the building block **SCM strategies** and of the building blocks **inter- and inter-organisation**. The description of the building block **SCM strategies** will be described within process structure derived from systems theory. The other building blocks of SCM strategies, such as decision, coordination and information, will be deducted from the resource-based view, through the fact that a company is using those strategies that enable the efficient use of their core competencies. Therefore the resource-based view is used for the description, on the one hand for the own companies' competencies and on the other hand the competencies of the organisations in the supply chain. Depending on the companies' competencies, specific SCM strategies (description of decision, coordination and information) will be implemented. The description of the building block **intra-organisation** follows system theory, principal-agent theory and SC-IM. The system theory defines the organisation forms and describes organisational integration, whereas the principal-agent theory contributes to the aspects of the motivation of individuals and SC-IM contributes to the environment topic. Due to the fact that asymmetric information is also an important part of the building block **inter-organisation** (interaction behavior), the principal-agent theory will be used. In addition the aspect of the building block inter-organisation, namely inter-organisational embodiment can be described with process and organisations structure, deducted from system theory. The environment, as well as the object of cooperation are described with the help of SC-IM.

Future research

The description framework deals with different theoretical approaches, in order to enable the description of the problems and within influencing factors of the implementation of the SCM strategies in the supply chain. Because the description framework enables the description of the challenges in respect of the implementation of the SCM strategies, the explanation framework is needed. This explanation framework contains qualitative and quantitative characteristics in order to find the relations between strategy and organisation form. Further research aims to elaborate the explanation framework by the following: explanation of the direct and indirect influence factors on SCM strategies and of the organisation form from the defined description framework, as well as determination of regularities between these influencing factors. One step will be the further elaboration of all framework components – the supply chain environment, the embodiment of supply chain behavior, the company and the business relations – as well as the causal influencing factors and effects between these components. The concretion of those framework components will firstly be qualitative. It will then be completed by quantitative measures of influencing factors as far as possible. Special research aspects will moreover be the distribution of trust and power in respect to SCM strategies. This follows the assumption that, due to the introduction of SCM strategies, objectives can develop differently in the environment of the supply chain or even the introduction of objectives cannot be realised. In addition, the objectives of the organisation that are drawn from company management and their possible effects on the objectives that are relevant to SCM strategies are analysed. The latter have a direct

influence on the choice and the implementation of SCM strategies. At the same time they affect the existing organisational structures, respectively the form of organisation that has to be chosen.

Finally the results of these investigations will be joined and observed with respect to the interaction of SCM strategies and different organisation forms. Complementary and indifferent effects are to be analysed, just like the concurring ones, in order to derive significant effects that are relevant for the analysis of interacting SCM strategies and organisation form. After the derivation of different effects and after that these are brought in a linkage, their quantification will be conducted in order to create a basis for the prediction framework and for a possible qualitative evaluation. By means of this the criteria for a substantiated evaluation of different forms of organisation for the planning and execution of supply chains can be derived.

The work on the **prediction framework** contains the extension of the explanation framework through the elaboration of existing modeling approaches developed in preceding projects. This will enable us to perform simulation experiments in order to quantify the above-mentioned coherences between SCM strategies and organisation forms. Based on the prediction framework the **decision framework** will contain guidelines for the management of supply chains.

Reference List

Andraski, Joe et al. (2002), "Global Commerce Initiative: Recommended Guidelines – Collaborative Planning, Forecasting and Replenishment (CPFR). Release 2.0," (accessed June 2002), [available at http://www.vics.org/committees/cpfr/voluntary_v2/CPFR_Tabs_061802.pdf].

Bachmann, Reinhard and Christel Lane (1999), "Vertrauen und Macht in zwischenbetrieblichen Kooperationen – zur Rolle von Wirtschaftsrecht und Wirtschaftsverbänden in Deutschland und Großbritannien," in Management von Netzwerkorganisationen: Beiträge aus der Managementforschung, Sydow, Jörg, eds. Wiesbaden: Gabler, 75-105.

Beamon, Benita M. and Victoria C. P. Chen (2001), "Performance Analysis of Conjoined Supply Chains," International Journal of Production Research, 14, 3195-3218.

Bock, Dieter et al. (2003), Studie Supply Chain Collaboration 2003 – Unternehmensübergreifende Zusammenarbeit. Bremen: Bundesvereinigung Logistik, KAT International AG.

Ford, David, Gadde, Lars-Erik and Lundgren, Anders (1998), Managing business relationships. IMP Group, John Wiley & Sons Ltd.

Grass, Brigitte (2000), Einführung in die Betriebswirtschaftslehre: das System Unternehmung; Systemelemente, Beziehungen und Strukturen im System Unternehmung, betriebliches Umsystem. Herne: Neue Wirtschafts-Briefe.

Hellingrath, Bernd and Mehicic-Eberhardt, Sana (2005), "Das grenzenlose Unternehmen," in Industrielle Organisation, Niess, Peter. S and Arnt Spandau, eds. München: Verlag Vahlen, 185-202.

Homburg, Cristian and Krohmer, Harley (2003), Marketingmanagement: Strategien - Instrumente – Umsetzung - Unternehmensführung. Wiesbaden: Gabler.

Holweg, Matthias, Frits K. Pil (2004), The Second Century: Reconnecting Customer and Value Chain through Build-to-Order. Cambridge, Massachusetts, London, England, The MIT Press.

Kubicek, Herbert (1975), Empirische Organisationsforschung: Konzeption und Methodik. Stuttgart: C.E. Poeschel Verlag.

IMP Group (1990), „An interaction approach,“ Understanding Business markets. Interaction, relationships and networks. David Ford, eds. London 1990, S.7-26.

Mehicic-Eberhardt, Sana, Hellingrath, Bernd and Witthaut, Markus (2005), Entwicklung eines ganzheitlichen Modells zur Bewertung verschiedener Organisationsformen zur Planung und Steuerung von Supply Chain, Technical Report. Dortmund: Universität Dortmund.

Lambert M. Douglas; Cooper Martha C.; Pagh J.D. (1998), "Supply chain management: implementation issues and research opportunities", *International Journal of Logistics Management*, 9 (2), 1-19.

Odette Supply Chain Management Group (2003), *Recommendation for Supply Chain Management (SCMo)*. Release Rev 2b, February 12th, 2003.

Odette Supply Chain Management Group (2003), *Recommendation for Supply Chain Management (VMI)*. Release Rev 2b, February 12th, 2003.

Perrow, Charles (1986), "Economic theories of organisation," in *Theory and Society*, 15, 11-45.

Pfohl, Hans-Christian (2004), *Logistikmanagement: Konzeption und Funktionen*. Berlin: Springer, 2. Auflage.

Picot, Arnold, Dietl, Helmut and Franck, Egon (1997), *Organisation: Eine ökonomische Perspektive*. Stuttgart: Schäffer - Poeschel.

Porter, Michael E. (1999), *Wettbewerbsstrategie, Methoden zur Analyse von Branchen und Konkurrenten*. Frankfurt (Main): Campus, 10. Auflage

Ross, David Frederick (1998), *Competing through supply chain management: Creating market-winning strategies through supply chain partnerships*. New York, Chapman and Hall.

Schreyögg, Georg (1998), *Organisation: Grundlagen moderner Organisationsgestaltung mit Fallstudien*. Wiesbaden: Gabler-Verlag.

Schnetzler, Matthias Johannes (2005), "Kohärente Strategien im Supply Chain Management: Eine Methodik zur Entwicklung und Implementierung von Supply Chain Strategien," doctoral dissertation, Zentrum für Unternehmenswissenschaften (BWI), Eidgenössische Technische Hochschule Zürich.

Seuring, Stefan et al. (2003), *Strategy and Organization in Supply Chains*. Heidelberg: Physica Verlag.

SFB 559, Project Homepage of the Collaborative Research Center 559: Modeling of Large Logistics Networks. (accessed January 10, 2006), [available at <http://www.sfb559.uni-dortmund.de>]

von Stengel, Rüdiger (1999), *Gestaltung von Wertschöpfungsnetzwerken*. Wiesbaden: Gabler-Verlag.

Wagner, Stephan M. (2002), "Gestaltung von Beziehungsmustern in Supply Chains," in *Logistik Management*, 4.

Wernerfelt, Birger (1984), "A resource based view of the firm," in *Strategic Management Journal*, 1, 171-180.

Williamson, Oliver E. (1975), *Markets and hierarchies: Analysis and antitrust implications*. New York: The Free Press.

Witthaut, Markus and Hellingrath, Bernd (2003), *Modellierungsrahmen für Dispositionsstrategien in GNL*. Technical Report – Sonderforschungsbereich 559 „Modellierung großer Netze in der Logistik“ 03007.