Supply chain strategising

Integration in practice

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Benedikte Borgström

Abstract

Departing from a practice perspective of social systems, this thesis examines customer ordered production. Building on Giddens's theory of structuration, the thesis analyses the principles and practice of a customer-oriented strategy in the supply chain system. While relevant literature outlines the complexity of a customer ordered production strategy, scholars have seldom appreciated the challenges and opportunities of operating in an integrated supply chain. Different supply chain actors are prone to undertake customisation in different ways that counteract each other. Customer ordered production changes as it is being practiced.

Usually customer-oriented strategies are in antithesis to cost-focused strategies. Such an opposition has been revealed to be false due to contextual complexities and dynamics. Instead, in this thesis I argue that planned supply chain objectives and emergent supply chain actions constitute a duality that at the same time enables and restructures strategic development. Learning how this duality evolves might enable the alignment of degrees of customisation and the restructuring of supply chain practices. Customer ordered production implies in practice coordination and adaptation of actors along the supply chain in order to achieve strategic advantages. Supply chain integration, which takes different forms in different contexts and situations, involves various functions and processes as well as enabling technologies with implications for alignment. While departing from the assumption underlying the idea and studies of supply chain management, that is to say, the capability and willingness of actors to take advantage of supply chain integration to act more effectively and efficiently, this thesis investigates what system integration and social integration mean in terms of how they work and what they imply.

Empirically, the thesis builds on the case of a car manufacturing supply chain, namely that of Volvo Cars. The case is presented in two ways: first, it is framed as the strategic development process of a customer ordered production and then as the performative development of a customer ordered production. The two presentations of the case are then confronted with each other. Volvo Cars is special in its industry because of its aligning of production system and supply chains to customer demand and building cars in response to customer orders. The specifics of customer ordered production at the same time facilitate and impede the action of different actors. The recurrent practices of the supply chain are influenced by several logics encountering each other, seen in terms of durability and change. Conditions and consequences vary for different actors in the supply chain, which causes dynamics and potentially conflicts and contradictions.

This thesis aims to inspire social analysis of supply chain integration by offering a practice perspective on the way supply chains work from strategy to practice and in between by engaging in a conversation with different streams of research, particularly supply chain management, industrial network approach and strategising. As customer orientation is widely accepted as a desirable aim for organisations and customer-oriented strategies are in use in business as well as in social and health sectors, just to mention a few, the consequences of such strategies, which this thesis critically investigates, have far-reaching societal implications.

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Chapter 1 - Introduction

In this chapter I will highlight the importance of a practice-based study to supply chain strategising and introduce the case of customer ordered production at Volvo Cars.

Strategy and logistics

Volvo Cars applies customer ordered production with responsiveness to customer orders and, basically, no inventory of complete cars, which in essence captures the trend of customer orientation. If customer orientation is to be more than managerial rhetoric, then its implementation in operations is of special importance. Volvo Cars needed to deal with the nitty-gritty of who should do what of logistics, manufacturing and distribution in the implementation. It is such particularities that set out what relation the customer has to the industrial system. The practices of the strategy are in the logistics of Volvo Cars' industrial system. Its complexity could easily diminish the degree of customer orientation in customer ordered production. There is still considerable ambiguity about what should be done in such a strategy process, especially in relation to logistics.

To maintain customer ordered production, practice is decisive but little is known about how to accomplish that. For managers in manufacturing, marketing and purchasing, logistics is crucial for their everyday activities and experience in order to get things done right and on time. In a strategy such as customer ordered production, logistics is fundamental. Still, research about how logistics relates to strategy is rare. The first time I saw logistics involved in the debate of the strategy-as-practice mailing list that is a forum used by scholars in the strategy-as-practice community, was in a theme suggesting that strategy is about experience, not abstraction. It was argued that "amateurs discuss strategy; professionals discuss logistics". The expression was surprising but seems to be a military maxim that emphasises the importance of what is going on at the frontline. Plans and practice are not in opposition to each other; only discussing strategy would be for amateurs while acting professionals need to engage in logistics; thus, strategy and logistics are closely related. What happens in practice has consequences that matter for most organisations, because logistics play a crucial role to their strategic outcome.

Logistics management means to plan, implement and control "*the efficient, effective forward and reverse flow and storage of goods, services and related information between*

the point of origin and the point of consumption in order to meet customers' requirements" as defined by the Council of Supply Chain Management Professionals, CSCMP (http://cscmp.org/aboutcscmp/definitions.asp, retrieved 20 October 2009), which is a not-for-profit organisation of professionals and academics. The concept of supply chain management emphasises strategic and relational aspects in addition to technical aspects of logistics. Thus, people are involved and they coordinate logistics activities that rely on inter-firm and intra-firm integration of relationships and activities. A commonly used definition is as follows:

> "Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies." (CSCMP, http://cscmp.org/aboutcscmp/definitions.asp, retrieved 20 October 2009).

Strategically, supply chain management is seen as an area where continuous improvements are possible as the requirements of effectiveness change over time. A common rhetoric in the supply chain management field is that firms do not compete with other firms; it is rather supply chains that compete (see, e.g., Christopher 1992). This means that your competitor is likely to draw on suppliers and customers to enhance performance and that you should do the same. There are a few studies that look beyond supply chain management prescriptions and question its proposed strategies (Fawcett and Magnan 2002; New 2004; Tan, Lyman and Wisner 2002). Likewise, few studies in general strategic management literature engage in the doing of strategy (Johnson, Langley, Melin and Whittington 2007; Johnson, Melin and Whittington 2003).

Fawcett and Magnan (2002) argue that the terminology of supply chain management is used frequently in a management environment and is generally associated with advanced information technologies, rapid and responsive logistics service and effective supplier and customer management. By conducting both surveys and case study interviews involving retailers, finished goods assemblers, suppliers and service providers, they reveal that supply chain integration practice seldom resembles the theoretical ideal. There appear to be tensions between the potential of supply chain management and the reality of supply chain collaboration.

A similar story could be told with a basis in the automotive industry despite the fact that it often serves as an exemplar of logistics integration. Its history of being the industry of industries relates to professionalism in management practice and technological development (Drucker 1946). The automotive industry is often used as a reference point for supply chain management because of its application of lean production, total quality management,

advanced logistics arrangements, enabling information technology and collaboration in product development. Despite professionalism in logistics coordination and a general belief to have supply chain management superiority, automotive representatives express that they need to embrace modern supply chain management concepts (Odette 2003). The gap relates to supply chain integration that is more difficult in practice than in supply chain literature. Reality includes a great number of ambiguous choices of the degree of collaboration in a supply chain, which is a complexity not revealed in the supply chain management rhetoric (Fabbe-Costes and Jahre 2007; Fawcett and Magnan 2002).

A case of customer ordered production

Volvo Cars, with a market share of less than two per cent in the automotive industry but market leading when it comes to safety aspects of cars, is also market leading in customer ordered production. In the automotive industry, innovative logistics solutions and cooperative product development are facilitated by integration with suppliers that improves operations. There is not the same emphasis on coordinating with customers of cars; being responsive to customer orders seems to be difficult. Thus, distribution systems are developed that integrate the dealer, and despite technological possibilities such as web-based interfaces with customers, the customer's demand is difficult to respond to in most automotive production systems. A representative of the automotive industry describes that building cars to individual customers, build-to-order strategies, is hampered by the nitty-gritty of logistics, manufacturing and supply. However, twenty years earlier, Volvo Cars implemented a strategy of postponed assembly of cars until the customer order arrived. Generally, the automotive industry assembled cars based on dealers' speculation of orders, but in Volvo's case it was the customer who actually bought the car that initiated assembly of the car. The implementation of customer ordered production was a great success and is still seen as Volvo Cars' strategy of how to sell and build cars. Customer ordered production is a principle nowadays. But what about practice? Is it in practice possible to cut the number of customer ordered cars by half and still be customer oriented? Experience and learning of how customer ordered production is handled with all complexity and dynamics is important to other firms in many different industries. To most practitioners, merely producing customer orders would be a dream, as many uncertainties related to costs of production and inventories, customer closeness, etc., would be alleviated. Customer ordered production is a specific strategy involving the supply chain and demanding coordination with customers as well as with suppliers in order to produce cars in response to orders. The order-to-delivery process of Volvo Cars involves delivery of complex products and dynamics of many different suppliers' production.

The automotive industry is an exception because of its purchasing volume and importance for supply chains. Firms in other industries may not be able to influence to the same extent. Regardless of industry, supply chains of autonomous firms cannot be managed as a single firm, manageability is more like coordination that depends on willingness and capability. Different firms are built up of people, of ideas, of resources, etc., that are difficult to manage also internally taking into account dynamics and complexity of the situation. A supply chain strategy might be planned by a powerful actor but is dependent on development of coordination and integration in a complex and dynamic setting. Volvo Cars is a professional firm that has been confronted by problems of various kinds over the years. So have its business partners; how would the complexity of different problems and solutions of the firms influence the strategy of customer ordered production?

Customer ordered production is a demanding supply chain strategy and a source of learning about supply chain practices and integration. It is of interest to learn about the strategy in practice, for example, what are the conditions and consequences for actors involved? How do they experience the development? And, what happens with the idea of the strategy? The automotive industry experiences overcapacity, downsizing, sudden changes in demand, a rapid pace of technological development and a low budget for that development together with difficult external demands from society. How do such dynamics influence the scenario? Supply chain management relies on the principle of supply chain integration rather than practice. Coordination and integration are prerequisites in principles of supply chain management, but the process of integration and integrative practices is about what happens. Experience and practice have gained little interest in supply chain management literature (Svensson 2003; van Donk and van der Vaart 2004), and the dynamics and complexity involved need to be explored in order to make abstractions that matter (Fabbe-Costes and Jahre 2007; Storey, Emberson, Godsell and Harrison 2006). What practices are needed in order to get the processes of coordinating and organising right? How do people practice metaphorical supply chain management principles such as pipelines, chains and networks? These and similar questions are basically neglected in the literature (Storey et al. 2006). Supply chain management practices are important to explore for actionable knowledge and relevance in research.

Supply chain strategy is a fascinating problem because the established strategic management principles of low cost and differentiation might be challenged by insights from practice. Volvo Cars initiated 100 per cent customer ordered production but the percentage has decreased over the years; why is that? Customer ordered production involves speculative production and postponed assembly in order to respond to customer orders, but all involved firms are supposed to have decreasing costs and improving responsiveness. The firms involved can to different degrees make use of production facilities that mass produce and of low costs in supply and delivery. Thus, what to do differs

and is dependent on circumstances for the individual firm. Well-functioning logistics management involves much complexity. In theory we know little about dynamics involved and what firms do. The interdependence in supply chains means that one actor's doing influences other actors. Learning about practice of supply chain strategy and supply chain integration is based in the exploration of its being done.

The lack of supply chain integration practice in supply chain management literature can be counterbalanced by aspects of integration practices from other sources. Practice theorising is based in interactions of a development (Gherardi 2009), and IMP (the Industrial Marketing and Purchasing Research Group) has contributed with empirically grounded knowledge of business interactions. But, despite IMP's problem orientation towards dynamic aspects of industrial systems and strategies pursued by firms in the industrial network, cross-fertilisation with the strategic management and supply chain management fields is rare. Thus, supply chain strategising has not attracted much interest from IMP researchers (Baraldi, Brennan, Harrison, Tunisini and Zolkiewski 2007). Since 2004 a series of special tracks are organised at IMP conferences in which the research focus is shifted to practice-based studies (Araujo, Kjellberg and Spencer 2008). A phenomenon such as markets is constructed through its practices in an iterative relationship between practices and market (Araujo et al. 2008). This is in line with the phenomenon of supply chain strategies, which implies a relationship between supply chain strategy practices and supply chain development. Also in strategic management research, the notion of strategy as practices has been developed (Johnson et al. 2007; Johnson et al. 2003). Neither market practices nor strategy practices have engaged specifically in supply chain practices but these inspire to a similar development of thought. Thus, if supply chain practice seldom resembles the theoretical ideal of supply chains as integrated systems (Fawcett and Magnan 2002), then the theorising should be revisited in order to learn about the form that supply chain integration takes as a result of practice.

Supply chain strategising relates to integration practices based on insights from a practice perspective of strategy and of industrial markets, which challenges supply chain management and logistics knowledge. The practice of customer ordered production at Volvo Cars relates to customer orientation, supply chain management, strategy and logistics and acts as relational founding to explore integration in practice in relation to supply chain strategising. Relevance of business administration research is a concern that engages: Not only in supply chain management studies is the theory and practice gap problematic but also in, among others, management studies (Williander 2006; Williander and Styhre 2006) and strategy research (Johnson et al. 2007; Johnson et al. 2003; Whittington 2006). Relevance and relational founding have a close relationship (Bartunek, Rynes and Ireland 2006; Dutton and Dukerich 2006; Weick 1995b). This is a reason why I will discuss a specific development of a

Volvo Cars initiative, customer ordered production. Next, a more theoretically informed problem discussion is presented.

Chapter 2 - Problem discussion

In the preceding chapter customer ordered production is outlined as a supply chain strategy dependent on a well-functioning logistics system that involves customers and suppliers among others. It is argued that supply chain strategy in practice needs to be explored. In this chapter I will show what kind of a problem supply chain strategy is. It is rooted in an SCM blind spot of social practices. I have argued that complementary theoretical fields are needed to get close to supply chain strategising, IMP for understanding interorganisational social exchanges and strategy-as-practice for a perspective on action and intent in the industrial network.

Supply chain fundamentals

Supply chain management (SCM) is a "new" research field with influences and contributions from other fields (Bechtel and Jayaram 1997; Croom, Romano and Giannakis 2000; Larson and Rogers 1998; Persson 1997; Tan 2001). Examples of academic departments that claim "ownership" of SCM include logistics management, engineering, operations management, purchasing, marketing and strategic management (Stank, Davis and Fugate 2005). There are also coexisting research traditions (see, e.g., Bechtel and Jayaram 1997 for a categorisation of different schools). For example, channels literature overlaps SCM literature in terms of how to serve the market with goods in an efficient and effective way (see, e.g., Cox and Goodman 1956; Gattorna and Walters 1996). Basically, a distribution channel might be described as a system based on a dominant actor, the producer at one endpoint and a customer at the other (Parment 2006). For an analysis of distribution channels over time, the IMP approach is an opportunity to understand dynamics in the actor structure and actors' activities (Gadde and Håkansson 1992). The dynamics are based on assumptions that resources in use are heterogeneous, that activities have close interdependencies outside the system and that actors' objectives cannot be presumed to be profit-maximisation (Hellberg 1992; Johanson and Mattsson 1987; Skjøtt-Larsen 1999a; 1999b). With this broad background, what is then distinctive for SCM?

Definitions of SCM relate to ontological traditions and theoretical approaches (Bechtel and Jayaram 1997; Cooper, Lambert and Pagh 1997; Lambert and Cooper 2000; Lambert, Cooper and Pagh 1998; Mentzer, Dewitt, Keebler, Min, Nix, Smith and Zacharia 2001b). The Council of Supply Chain Management Professionals (CSCMP) surveyed academics' and practitioners' (6,422 members, response rate 11.2 %) view of SCM in order to explore what should be and should not be included in a definition. The survey indicated that strategy, activity and collaboration are key components (Gibson, Mentzer and

Cook 2005). Actually, academics preferred a strategy-focused definition while practitioners wanted to include activities.

Typically, the work of supply chain practitioners includes planning and managing operational activities and collaborative activities in a business model aiming at efficiency and effectiveness. Thus, they work with processes that are cross-functional and that involve several firms. Coordinating these processes implies several challenges. A recent thesis illustrates problem solving of such challenges at a low organisational level in the case of customer ordered production (Abrahamsson and Helin 2004). Coordination and integration rely on people, practices, strategic decisions and negotiations within and across firms. Supply chain management literature, especially logistics management literature, has outlined what strategies should aim at but less about how and what additional implications might arise from the activities. The conditions and consequences of integration in practice need further research (Fabbe-Costes and Jahre 2007; Fawcett and Magnan 2002) The dynamic aspects of practice are unexplored and the SCM field needs complementary theoretical perspectives for holistic explanations (Giunipero, Hooker, Joseph-Matthews, Yoon and Brudvig 2008; Ketchen Jr. and Giunipero 2004; Peck and Juttner 2000; Skjøtt-Larsen 1999b; Svensson 2003).

The IMP approach is seen as appropriate in order to study interorganisational processes in long-term relationships, such as a supply chain development (Hellberg 1992; Peck and Juttner 2000; Skjøtt-Larsen 1999a). In this approach, the dynamic integration of supply chain processes (Hertz 1993) is seen as a source of advantage based on interdependencies among actors, resources and activities (Håkansson and Persson 2004; Johanson and Mattsson 1992). The value of a network approach to holistic explanations of supply chain development would be seen as incontrovertible, but after a short elaboration of such a claim I will discuss that it needs to be complemented in order to understand the supply chain strategy of customer ordered production in practice.

The IMP approach explains interactions, relationships and networks of industrial firms and other stakeholders (Axelsson and Easton 1992) based on a solid set of assumptions for a supply chain study. Interactions provide the dynamic aspects of relationships (Johanson and Mattsson 1987). Interactions can be seen in commercial, financial, technological and social dimensions (see, e.g., Liljegren 1988). Relationships, direct and indirect, are the basis of cooperation and adaptation to achieve complementary objectives, increase effectiveness of exchanges and reduce uncertainties in the environment (Easton 1992). Therefore, dependence on the other party in the relationship is natural, and coordination originates in interactions. Relationships are investments made of coordination and integration. Investments are processes of resource commitment to assets (Johanson and Mattsson 1987). Investments increase interdependence in relationships; Easton (1992) contrasts hard investments such as investment in a customer-specific tool with soft investments such as

knowledge of a partner's technology, routines or logistics needs. Thus, integration is dynamic but also complex in that it takes different shapes simultaneously.

Networks of firms are unmanageable, in the sense of being controlled and directed by a single firm (Ritter, Wilkinson and Johnston 2004), but network processes are coordinating mechanisms when strong interorganisational relationships exist (Easton 1992). Firms are too independent to be "managed" and the activities are too diverse to control. Interdependent relationships have a coordinative influence on the supply chain through the need for coordination at the dyadic level, which also implies a certain degree of inertia in the network because of the bottom-up self-organising way of network members (Wilkinson and Young 2002).

Several studies from the IMP group have viewed strategy as emerging because of existing activities, resources and actors (Gadde, Huemer and Håkansson 2003) and argue that firms basically have to cope based on their position in the network (Harland and Knight 2001; Harland 1996b). The foundations of strategic actions by a focal actor are its (1) network position, (2) resources and (3) 'network theory' (Johanson and Mattsson 1992, p. 215). Strategising from an IMP perspective emphasises dynamics and complexity meaning that firms need to consider simultaneously the heterogeneity of resources and interdependencies between activities across firm boundaries, as well as the organised collaboration among the companies involved (Gadde et al. 2003:157). IMP researchers use rich descriptions in efforts to understand the processes of interaction between organisations in networks (Baraldi et al. 2007). Despite this, contributions to the strategy literature have been fairly modest (Baraldi et al. 2007). To some extent, this is understandable, as strategy literature involves a wide diversity of approaches that are incompatible with the assumptions of IMP. However, Baraldi et al. (2007) outline the strategising approach (strategy-as-practice) as aligned to assumptions made and methodology applied in the IMP approach in their comparative analysis of different schools of thought in strategic management. A supply chain strategy of customer ordered production in practice is a problem of strategising in industrial networks.

Supply chain strategising relates to integration practices and interactions in the industrial network and thus the IMP approach is a feasible framework. Many issues within the IMP tradition concern micro dynamics of episodes and recurrent interactions but action might be lost because of predetermined categorisations. There is still considerable ambiguity about what happens. Kjellberg and Andersson (2003) suggest that IMP's dominating levels of analysis of business exchange episodes, relationships and networks need to be seen in connection as the action is also between these levels in a research process. Consequences and reactions might bring in another level to a scenario of what happens. Interactions and investments in relationships bring many

possibilities, and in relation to integration in practice it is important to further investigate action of industrial networks as in strategising.

Strategising in the supply chain

The SCM field has taken a route to understanding strategic issues via the strategic management field that is in line with its dominant traditions. One example is Porter's value chain concept that has been related to the supply chain concept (Persson 1997) and the firm's competitive advantage, such as cost advantage or customer closeness (Chopra and Meindl 2001; Morash 2001; Sandberg 2007). Hitherto, most of the applied strategy theories and conceptual models are used for hypothesis testing in supply chain studies (Cheng and Grimm 2006), and cross-sectional studies involving few variables dominate the literature (Craighead, Hanna, Gibson and Meredith 2007; Giunipero et al. 2008). Thick descriptions that provide holistic understanding are rare.

An exception is Sandberg, who studied the role of top management in SCM practices (2007). In a multiple-case study of three "best SCM practice" companies, the strategy content, the strategy formation process, the supply chain orientation, coordination and continuous development of Dustin, Clas Ohlson and Bama were analysed. A common denominator among these cases was the capability in operational logistics and IT support. Their strategic development was driven by lower hierarchical levels rather than by the top management level. Top management is actually described as absent when it comes to the strategically important capabilities. Sandberg's analysis is based on the positioning perspective in order to categorise the cases, on the resource-based view in order to outline capabilities and on Mintzberg's (1998) view on the strategy formation process. The positioning perspective and the resource-based view are the most preferred strategy theories in SCM literature (Burgess, Singh and Koroglu 2006). In order to explain the absence of top management influence, Sandberg has to go outside his theoretical framework; he draws on Regnér's (2003) findings that inductive strategy making improves the development of supply chain practices. Regnér's (2003) argumentation draws on how strategy in practice is created and developed by micro-level processes and activities. Strategy in practice, thus, focuses on understanding action. After a short elaboration of the most preferred SCM explanations of strategy (Burgess et al. 2006), I will come back to strategy-as-practice.

The theoretical directions of strategic management, earlier mentioned as the most preferred in SCM research, are within the strategic management field argued to be of little relevance to strategising practitioners. However, these theoretical directions fit with popular methods in use in SCM. First, the positioning perspective (with Porter 1985 as the main character) implies that a firm can strive to achieve a competitive cost advantage by performing value chain activities at a lower cost than its rivals or by differentiating its offerings

from competitors' offerings. In such propositions, the shaping of strategy and the firm's external relations are not sufficiently emphasised (see, e.g., Melin 1985). In the strategy literature the term value chain (Porter 1985) is more common than the term supply chain (Harland 1996a), which implies a slightly different metaphorical perception and focal interest. The main difference is that the term value chain says little about actors involved, i.e., about the supply chain relationships and structure. Rather, acontextual added product value and business models seem to be scrutinised. The generic strategic alternatives of low cost and differentiation can be pursued in the context of a broad target market or a narrow target market. Second, the resource-based theory is described in its origins, assumptions and implications by Barney and Arikan (2001); it implies that valuable, rare, costly-to-imitate and non-substitutable bundles of resources, controlled by a firm, are the source of competitive advantage. The content in the resource-based view is close to "the capabilities view", "the dynamic capabilities view", "the competence view" or "the knowledge-based view", because they all draw on firm attributes as critical independent variables, specify roughly the same conditions under which these firm attributes will generate persistent superior performance and lead to largely interchangeable empirically testable assertions (Barney and Arikan 2001). Both these perspectives are in line with the content school, i.e., they are about what causes a performance as in what variables are statistically significant. Content is important but dynamics in development is needed in order to understand what happens. Melin (1992) argues that when we study strategy processes also content needs to be in focus and that the dichotomy of process and content in strategy research has been misleading because one is needed to understand the other. What is a process study, then?

Process research with Pettigrew as its leading figure is about how strategic processes develop, especially strategic change. Process studies have focused on strategic change over time involving organisational complexity, people and their behaviour and the contextual situation of the change (see, e.g., Pettigrew 1992; 1997). In a process study the wholeness and the ambiguity of change are needed in theorising of industrial reality (Melin 1987). How a strategy develops is often characterised as "muddling through" (Lindblom 1959), or as a process of logical incrementalism (Quinn 1980) and as a deliberate and emergent process (Mintzberg and Waters 1985). The process perspective on strategy assumes plural outcomes and a pragmatic process forward (Mintzberg and Waters 1985). Process studies are often case studies in order to account for ambiguities, complexity and dynamics in strategic processes (Langley 1999). The IMP Group's view of strategy (Gadde et al. 2003) is based on process studies but has only made modest contributions to the understanding of supply chain strategising. Few SCM studies question rationales and aim to understand strategic supply chain processes (Fabbe-Costes and Jahre 2007). The supply chain literature is abstract and gives little insight into the strategic process and practices involved (Fabbe-Costes and Jahre 2007; Storey et al. 2006). Research

into supply chain strategies, for example that by Fisher (1997), draws on the planning and position school (see descriptions of schools in Mintzberg, Ahlstrand and Lampel 1998). The focus of the SCM literature on content explanations rather than process explanations of supply chain strategy might result in lost relevance (see, e.g., March and Sutton 1997). Explanations of emergent supply chain strategies are neglected (Sebastiao and Golicic 2008), and interpretative process research is unusual (Craighead et al. 2007). Separating content and process issues in strategic development has negative implications both for a holistic theoretical advancement and for relevance and application (Johnson et al. 2007; Johnson et al. 2003).

Practice is based on process issues as well as content issues; these are inseparable in the happening, such as in the development of a strategic idea (Chia and MacKay 2007). Thus, a practice study is likely to challenge the Fisher paradigm that strategies need to be either physically efficient or market-responsive (also challenged by Selldin 2005; Selldin and Olhager 2007) because it draws on a social process of how the either/or content is affected over time by, for example, conditions and consequences. The strategising perspective focuses on particularities, people, routines and activities (Johnson et al. 2003; Whittington 2003; Whittington and Melin 2003), which are key elements of practice. The strategising perspective focus is on "*the detailed processes and practices which constitute the day-to-day activities of organization life and which relate to strategic outcomes"* (Johnson et al, 2003:14), thus, strategic practice is based on an objective of long-term or short-term result of operations. A challenge seen in the strategising perspective is to capture how micro processes contribute to general macro outcomes (Johnson et al. 2003). However, seeing strategy in the logic of practice reformulates the problem of agency and structure and sidesteps the 'micro/macro' distinction (Chia and MacKay 2007), in line with the suggestion by Kjellberg and Andersson (2003) that action does not follow predetermined categorisations and levels of analysis. Micro and macro issues are always together in the happening.

The contribution of strategy in practice to understanding supply chain action is potentially in inductive versus deductive strategy making, which are described as based in different logics. Regnér (2005) argues that both adaptive and creative strategy logics are basic strategy logics. A logic means the underlying procedures, activities and reasoning that generate a particular type of strategy. Regnér argues that in a complex context, a creative logic is likely to be more applicable than an adaptive one, but suggests that this holds only generally and in the long term. In the short term, the two logics complement each other within and across strategy processes. Inductive strategy making is externally oriented and exploratory strategy activities in the periphery of the organisation, such as a project's trial and error, informal noticing and experiments (Regnér 2003). In contrast, strategy making in the centre is more deductive, involving an industry and exploitation focus and activities like planning, analysis, formal intelligence and the use of standard routines (Regnér

2003). These findings are interesting to SCM research because others than the top management team are seen as influential in the strategic development.

Strategising in an interorganisational context is little researched beyond Regnér's work (Regnér 1999; 2003), which is problematic because the interorganisational network makes strategic sense (Baraldi et al. 2007; Gadde et al. 2003; Harrison and Prenkert 2009) and is important in order to understand dynamics of supply chain interdependencies and complexity of the supply chain structure involved in interorganisational interactions. Despite the increased interest in supply chain management practices (Fabbe-Costes and Jahre 2007; Fawcett and Magnan 2002; Sandberg 2007; Storey et al. 2006; Tan 2002) and integrative practices of strategic development (Abrahamsson and Helin 2004; Elter 2004; Regnér 1999; 2003), little attention is directed to practice studies, based on sociological metatheories (Gammelgaard 2004).

Practice-based studies have created a practice turn in many related streams of literature, such as strategy-as-practice (Johnson et al. 2007) and marketing-as-practice (Araujo et al. 2008), and the practice perspective is applied to projects (Hällgren 2009), to management studies (Orlikowski 2000) and to social practice such as learning (Elkjaer 2004; Gherardi 2009). The lack of practice-based supply chain management studies is problematic if we like to explore whether supply chain strategy is the Emperor's new clothes (Fabbe-Costes and Jahre 2007), whether the supply chain actually impacts organisational strategising (Jarzabkowski and Spee 2009), and whether a micro view of strategic development actually gives relevance and meaning (Johnson et al. 2007). Particularly Gammelgaard (2004) indicates that such an approach enables exploration of the human side of logistics strategies and implementation in a new and alternative way with potential to benefit both research and practice by increased closeness.

Strategising in supply chains is meaningful to further theorise about, based on the case of customer ordered production and a purposeful combination of several theoretical fields. SCM and logistics, IMP research and strategising research are bridged in order to understand the problem outlined. These have paradigmatic similarities in assumptions made but also a basic incompatibility in terms of vocabulary and goals. Development in practice of customer ordered production has implications that make sense to these fields. The pluralistic approach is beneficial both because of theory building in itself and because it might cultivate the use of multiple approaches in the theory building of others (Gioia and Pitre 1990; Schultz and Hatch 1996). Strategising in supply chains involves integration that we know little about in practice.

Synthesis of the problem; purpose of the study

SCM research does not yet have a theoretical underpinning that explains strategic supply chain development, where the basic concept of supply chain

integration is questioned. Therefore a thick description of a supply chain strategy is needed, which includes cross-disciplinary conceptualisation and empirical insights.

Empirically, customer ordered production is a supply chain strategy in which integration is key in order to build cars in response to orders. Volvo Cars' production system and supply chains need to be aligned to customer demand. Theoretically, the industrial network approach contributes with rich descriptions of the development of industrial networks, and the strategising approach contributes with a practice-based view of strategy. The common denominator is holistic explanations: The methodology of the industrial network and that of the strategising approach are based on micro stories about people, activities and resources involved in processes and theoretical generalisations, which so far is an unutilised approach in SCM research. This is peculiar since logistics and SCM comprise many different activities of people, expertise of functional areas and different organisational strategies.

It is presumed that dynamics and complexity of practice relate to the happening of strategic content and process development. How dynamics in development relates to content in development over time needs to be explored in order to learn about strategic SCM development. The purposeful combination of several theoretical fields serves as a theoretical zone where social practices bridge in the theoretical analysis in order to learn about supply chain development. The integration of supply chain processes is seen as an emerging process of interorganisational strategising.

Strategising involves both the strategy process and content and seems to relate to changes in a network's multiple objectives, degree of integration and logistics coordination. Its dynamics and complexity seems to be important in explaining how integration actually develops. Over time, strategic content might become controversial and come into conflict with the process because the situation changes. The agreed-upon principles of how to do might deviate from practice. The content of Volvo Cars' supply chain strategy shapes order fulfilment practices that integrate many actors in different dimensions. Integration can hardly be treated as a static concept; it influences strategising and characterises a supply chain. The involved dynamics and complexity need to be examined in order to learn how integration works in practice. It is reasonable to presume that strategy development affects the supply chain and vice versa – but how?

The purpose is to explore and analyse how customer ordered production can be understood and conceptualised. Further, what meaning is to be understood from principles and practices of the customer order based strategy? The principles prescribe a performance of purposeful action in an industrial network, and practice involves intended and unintended consequences. Finally, what implications for integration can be drawn?

Dissertation outline

The dissertation is outlined in Figure 2.1, and in the problem statement I argued that static explanations are not enough to understand supply chain strategies. I proposed practices in order to take advantage of a pluralistic theoretical perspective including dynamics. The conceptual apparatus of ostensive definitions that explains principles of customer ordered production (COP) is substantiated by SCM and logistics literature, IMP literature and strategising literature. The COP practice of performative definition is based on action of change and of stability, in order to learn from COP in use underpinned by social practice literature. The principles and practice of COP make up the theoretical framework that is wrapped up in a research model. The research model puts forward two views, the "closed" one with derived ostensive explanations and the "open" one with a practice view of COP performance.

The methodology describes the working procedure and the ontological standpoint that are related to the study. The problem statement, the theoretical framework and the methodology guide the empirical material of interest and the analysis. The first empirical chapter contextualises the COP development, while the second explicates the development and the third goes into different actors' effects on the development.

At the end of the second empirical chapter an empirical analysis is illustrated of the initiation and development of COP in relation to the first empirical chapter. At the end of the third and final empirical chapter an empirical analysis of the effects is to be found.

The analytical chapters follow the logic and structure of the theoretical and empirical chapters. The first one moves into the analysis of the ostensive explanations and the processual development of COP. The second analytical chapter starts afresh with a performative explanation of situational effects of the development by drawing on Gherardi's, Orlikowski's and Feldman's views of practices. The third analytical chapter attempts to confront findings from the two preceding chapters by explicating contradictions and conflicts in the development. The earlier mentioned practice research draws heavily on Giddens's theory of structuration but hardly discuss the part of contradictions and conflicts. Therefore, this chapter draws more on Giddens's (1979; 1984) original texts in order to understand consequences of strategic development. The final analytical chapter discusses a meaning of interorganisational strategising and logistics integration based on the second-order concept of social practices. The analytical tour ends by a conclusion of the purpose and a suggestion of contributions.

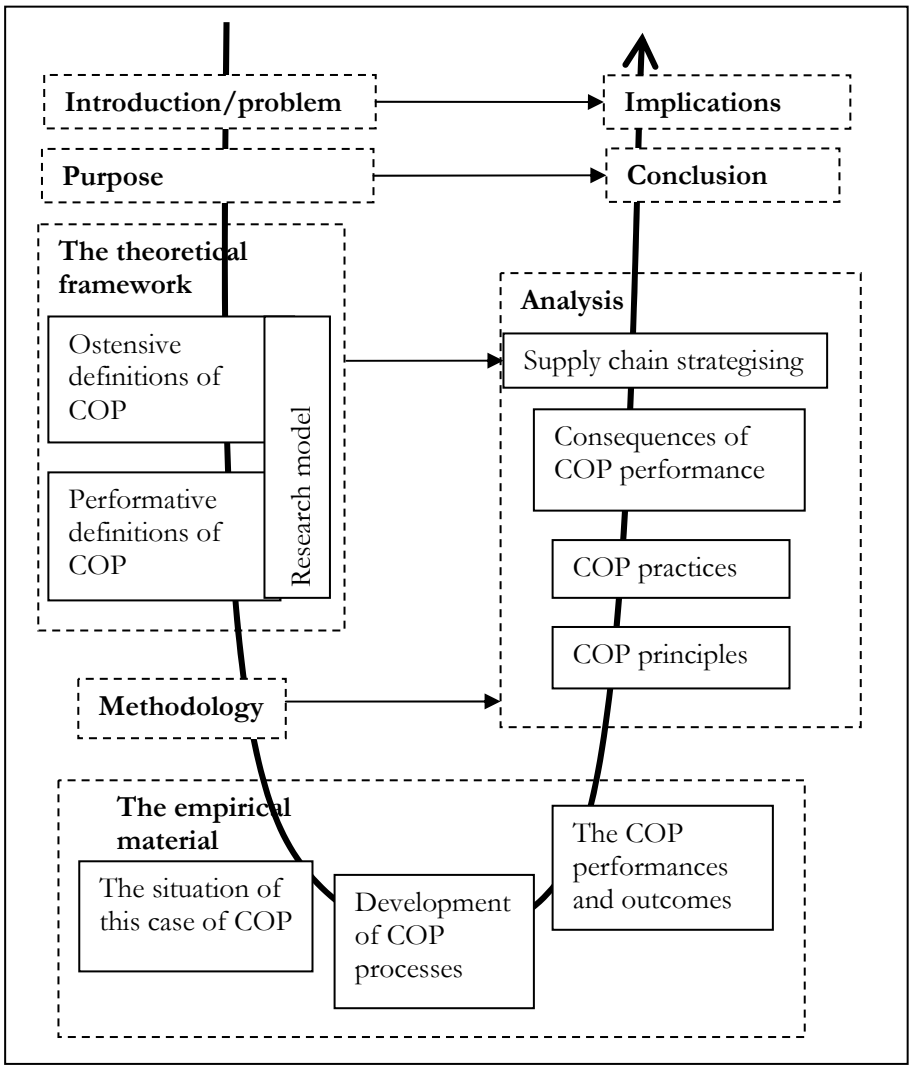


Figure 2.1 Dissertation outline (adapted from Lekvall, Wahlbin and Frankelius 2001:183).

Chapter 3 - Frame of reference

In the previous chapter it is argued that research in supply chain management has explained principles rather than explored practices. The principles related to customer ordered production at Volvo Cars might be explained by SCM and strategic management concepts. However, with the purpose of understanding strategic development, I have argued for a practice perspective in order to explore the actual performance. Therefore in this chapter, I am elaborating on and using the principles in order to learn about the literature discourse of customer ordered production. These draw on the logistics/SCM field, the strategy field and the IMP field. The chapter ends with an exploration of how strategy development in practice, makes up interorganisational strategising. Opening the chapter, the practice lens is a fundament that I will draw on and therefore I start to delineate it briefly (before customer ordered production is described and analysed in its principles and before I outline practices of strategic development).

Introduction

At this point I have criticised existing theories and now the task is to reflect on what is at hand, make use of the criticism, and start a creative reflection process. This chapter is an attempt at such reflection. Following this introduction, it is built along two lines that form the backbone of the chapter; they are the ostensive and performative definitions of customer ordered production. The ostensive definitions explain *principles* and form a reference point for meaningful literature that is well known to readers from each perspective; they are regarded as a natural frame of reference in research literature. The performative definitions explore *practices* (which is my focus). The performative definition of customer ordered production needs to be developed. In the section about principles I learn from the bulk of literature about stabilising actions (logistics practices), dynamics and complexity that might be a part of the development, and in the section about practices I learn how action might be studied and how dynamics and complexity might come into action. The separation into ostensive and performative definitions is inspired by Bruno Latour's analysis of society (Latour 1986). Latour was dissatisfied with the notion that the word "social" was infused with presumptions and acted as a solid manifestation and a picture of its properties. Instead of a structured set of principles, the very action is seen to define society's development and inertia. Czarniawska illustrates this in her view of organisations – there is no such thing as an organisation; organisations have neither nature nor essence, they are what people perceive them to be (Czarniawska 1993:9). Organising is, in contrast, an ongoing intertwined

process of principle and practice. I am inspired by her meaning-making in separating ostensive definitions and performative definitions. The ostensive definitions are typically possible to demonstrate and visible in literature, but in practice these explanations are difficult to detect; the ostensive definitions explain principles. The performative definitions are given in a language that permits action and gives 'aha!' understanding. And in practice these are given a specific purpose, which is possible to characterise: the performative definitions explore practice. More specifically, the principles of a supply chain strategy, such as customer ordered production, and of supply chain integration are characterised in literature as explanations and images like the Emperor's new clothes (Fabbe-Costes and Jahre 2007) because they are difficult to detect in practice. In order to permit action, these definitions need to be infused with actual dynamics and complexity as well as with actual stability. In the frame of reference ostensive definitions are discussed and a base for performative definitions is given.

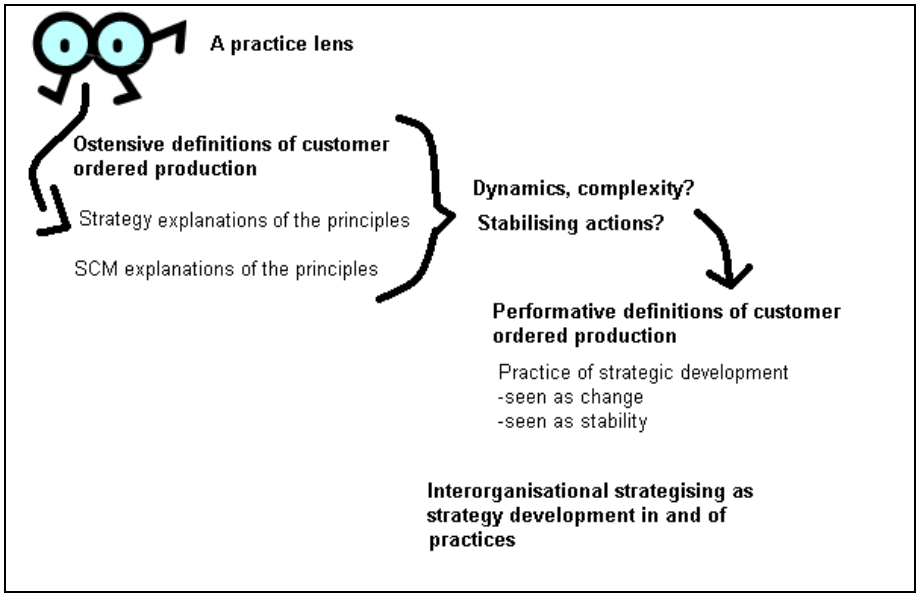


Figure 3.1 Principles of customer ordered production informs practice.

Figure 3.1 illustrates the structure of this chapter in line with Czarniawska's division of ostensive and performative definitions. The chapter is introduced with a description of what I mean with a practice study; what a practice lens is in order to explore practices. This kind of practice study is new to the SCM field and therefore in need of specific elaboration. It differs from practice studies that delineate best practices (practice-performance studies), which are common in the field.

Then, I will elaborate on the principles of customer ordered production (see Figure 3.1), which have shaped our understanding from the perspectives of strategic management, logistics and supply chain management. The explanations from various theoretical fields differ, as they explain different aspects, and I search purposefully for what is known in terms of stabilising actions, complexity and dynamics related to action and practice of customer ordered production. Together with these explanations I will continue to develop meaning related to practice of strategic development, especially customer ordered production (see Figure 3.1). Finally, I will synthesise the framework in a section of interorganisational strategising as strategy development in and of practices, which becomes a research model.

A practice lens

Practice theory is used by various disciplines, often in order to move beyond their problematic dualism and ways of thinking, but there is no unified practice approach (Schatzki 2000). Practices are often seen in social sciences as arrays of human activity while some argue that nonhuman activity should also be included. Strategising and organising are practices that have been treated as implicit knowledge (Johnson et al. 2003) in the strategic development literature. Despite its short history (early 2000s), a strategy-as-practice approach is outlined in terms of a conceptual framework for categorisation (Jarzabkowski, Balogun and Seidl 2007), the approach taken has received criticism because assumptions of the practice approach are sidestepped and the studies are often re-labelled process studies (Carter, Clegg and Kornberger 2008; Chia and MacKay 2007; Gherardi 2009). However, the intent is to treat strategy as something people do and the practice turn is argued to be incomplete in that researchers have difficulties to integrate strategic activity and aggregate effects in studies (Whittington 2006).

A practice study involves both; Gherardi (2009) argues that a practice study concerns *what is happening*, which is more than being synonymous with 'routine', 'what people really do' or 'praxis'. Orlikowski (2000) draws on Taylor (1993) discussing that our conventional view of rules and resources suffers from an objectivist reification while the view of rules and resources as internal schemas suffers from subjectivist reduction. Instead, the rule animates the practice and the rule is what the practice has made it. External entities and internal schemas are rules and resources only when they are implicated in recurrent social action (Orlikowski 2000). Practice is seen as the generative source of knowledge of conduct (Gherardi 2009). For example, humans' recurrent use of a technology as users is a way to enact a set of rules and resources, which structures their ongoing interactions with that technology. The emergent performance of these interactions is described as technologies in practice (Orlikowski 2000). In a similar way, a recurrent use of a strategy is a way to enact a set of rules and

resources, which structures their ongoing interactions. The emergent performance of these interactions is then strategies in practice. Theory of practice is based on the assumption that agency is distributed between humans and non-humans and, regardless of human intentionality, actions are viewed as they take place, that is, in their happening (Gherardi 2009).

Theorisation and methodology are tightly interconnected in conceptions of practice. In a practice lens, principles and performance are seen to interact in the happening, thus the separation in this framework is for analytical reasons. Gherardi (2009) outlines three views from which practice might be researched, the outside, the inside or by effects:

- An inquiry of practices from outside questions the regularity of practices, which organises activities, and the shared understanding that allows their repetition. From outside, practices might be analysed as an 'array of activities'.
- From inside, practitioners and the performed activity are parts of knowing how to align humans and artefacts, such as knowing how to construct and maintain what Czarniawska denotes an action net (2004b). Knowing is a situated activity that people do in everyday activities when they work together. By seeing, listening, reasoning and acting in association with human and non-human actors, the happening is analysed.
- Seeing practice and its effects by a texture of connections in action is practices in terms of consequences. It is the social effects of a practice that are studied in relation to its being practiced in society. Practice is seen "as the effect of a weaving-together of interconnections in action, or as a 'doing' of society" (Gherardi 2009:118). The analysis is through reflexivity of practices and the reproduction of society, such as reflexivity of theoretical construct and its effects.

These approaches are complementary. For example, in research of supply chain management the outside approach might be a study of how logistics managers coordinate transports, what array of activities might be found and the reasons for them. The inside approach would in a supply chain management example mean participation or close engagement with people involved in a project in order to make sense of what is happening. An example of the by-effects approach is to exploit effects of a supply chain management practice such as information sharing and investigate how it cuts across organisational and interorganisational practices and produces effects rooted in the intentional or unintentional doing of actors. The by-effects approach is of a particular interest to my study of development over time. How is it then possible to make sense of this in a study of supply chain strategising?

Practice arrangement

My suggestion is to operationalise the by-effects approach (Gherardi 2009) by viewing the supply chain as a practice-arrangement bundle (Schatzki 2005:476), which (1) is a product of actions performed in practices, (2) is a mesh that embraces existing and sometimes altered practices and material arrangements and (3) continues in existence that accommodates evolution and focused changes in the mesh. I draw on Schatzki (2005) and suggest that the customer ordered strategy in a supply chain (1) is a product of actions performed in relevant practices, and (2) is a mesh of practices in development that (3) are altered deliberately and emergent, which might be described as a bundle of practices and material arrangements. There is a confederation of such practice-material bundles which overlap and interact. Schatzki argues that two questions are central to analyse: how did the bundle originate and how is it perpetuated?

Schatzki's elaboration of practice-arrangement bundles informs about what should be studied, while Gherardi's seeing-practice-and-its-effects elaboration informs about how it might be studied. The bundle will change over time and include different versions of practices (product development practices, governance practices, administrative practices, meeting practices, order fulfilment practices and purchasing practices). The material arrangements might include office space, supplier parks and meeting rooms. Many of the practices of the strategy are part of practice-arrangement bundles specific to parts in the supply chain while also overlapping or conflicting with constitutive practices from authorities or from top management. Therefore, practices overlap and connect. Schatzki (2005) exemplifies an *overlap* as when actions are part of two or more practices and a *connection* as when actions from different practices form chains, actions from different practices are performed in the same place in the material arrangement and actions from one practice forms beliefs of participants in other practices. Consequently, a customer ordered strategy in a supply chain is a myriad of practice-material bundles that overlap and interact. The idea of a practice analysis is to understand the origin and development of a strategy, by reflexivity of practices involved and their effects.

Orlikowski (2000) proposes a practice lens to examine how people enact structures which shape their emergent and situated acting. The process of enactment enables a deeper understanding of the constitutive role of social practices in the ongoing and changing acting in the workplace. The assumption is that people are purposive, knowledgeable, adaptive and inventive and engage in different ways in order to accomplish various and dynamic ends. When practice does not help them, they abandon it, or work around it or change it, or think about changing their ends by reinforcing, ignoring, enhancing, undermining, changing, working around or replacing their existing situated and emergent practice (Orlikowski 2000:423ff). A practice lens is used to understand the situated change (Perrotta 2010), organisational transformation over time (Orlikowski 2001), the overlapping and connected mesh of practices

and material arrangements (Schatzki 2005) and the development of technology in practice (Orlikowski 2000), which makes sense to study performance of customer ordered production in its development.

An example of a situated practices study related to technology change is that by Perrotta (2010), which uses an empirical example of assisted reproduction, where a new technology is going to take the place of the old one. The change is not planned but emerges from the situated practices studied in three different organisational contexts. The technologies have few differences in terms of obtained results and coexist in the daily work practices of the reproductive centres. The progressive passage from the old to the new technology is tied to knowledge processes that evolve. Italian law is one of the factors that activate knowledge and guide action, in this case the choice of technology; others are related to series of practices. This shows how a focus on the happening will explain the development (Perrotta 2010). The example shows how technological change in action is tied to knowledge processes and modifies work practices. With this said about practice studies, I will next extract principles and explanations of customer ordered production that are visible from plausible strands of literature.

Principles of customer ordered production

The cross-disciplinary nature of SCM is problematic in terms of perceptions of what theory is and related implications. Theory might aim at the dynamic and complex nature of social science or the precise nature of natural science. Many natural scientists argue that describing phenomena using categorisation, typologies and metaphors might be powerful tools for managers but it is not theory (Schmenner and Swink 1998). Theory in operations management needs to be developed in a format that can be falsified, refined or supported (Schroeder 2008), a view that is also adopted by some social scientists (March and Sutton 1997; Sutton and Staw 1995). However, many social scientists argue that what theory is not, theorising is (Czarniawska 2008; Weick 1989; 1995c). Are then the theoretical outcomes compatible?

I will make sense of customer ordered production (COP) as a concept with specific principles that are accepted as knowledge among researchers as well as among practitioners. The principles of COP depend on what perspective is taken. Based on research output (publishing in journals), SCM research might be categorised as published in three clusters; one with a marketing and strategic management perspective, one with a logistics/SCM perspective and the last one with an operations management perspective. Due to overlaps and connections in these, I account for strategy explanations of the principles that will be followed by SCM explanations of the principles.

Strategy explanations of the principles

The principles of COP guide order fulfilment execution. Production will be initiated as a response to customer orders, which favours customer orientation rather than standardisation and scale economies. Customer means the user of the products and services, thus, a car customer might be, for example, a private or a fleet customer but not a dealer. The role of customers in a firm's operations increases and such customer interaction reduces uncertainty of demand (Hulthén 2002; Kaplan 2002). To a supply chain, customisation means that boundaries to customers and suppliers are fluid in the meaning that these are involved in the same order fulfilment process. COP is thus an arrangement of order fulfilment practices that involve different parties. It might be described as a build-to-order strategy for customised products based on standardised components. Lampel and Mintzberg (1996) discuss a strategic continuum of standardisation and customisation for a manufacturing firm with four stages in its basic value chain: design, fabrication, assembly and distribution. The increasing degree of customisation in these configurations comprises five different strategies (Figure 3.2):

- Pure standardisation, which is reliant on a broad group of customers willing to take the same offer, thereby allowing firms to take advantage of economies of scale.
- Segmented standardisation, which is reliant on aggregated clusters of buyers as in the designer market. The strategy aims to offer a huge variety and customised delivery but not to the customers' requests, i.e., the product offer is standardised.
- Customised standardisation implies customised assembly but standardised fabrication. The configured components are mass-produced for the aggregate market. The configuration is constrained by the range of available components and a central core such as an automobile body.
- Tailored customisation. A product prototype is modified and adapted to particular customers' wishes.
- Pure customisation. Customisation goes all the way back to design. Buyers and sellers are deeply involved in each other's decision making as in specific, non-recurrent projects.

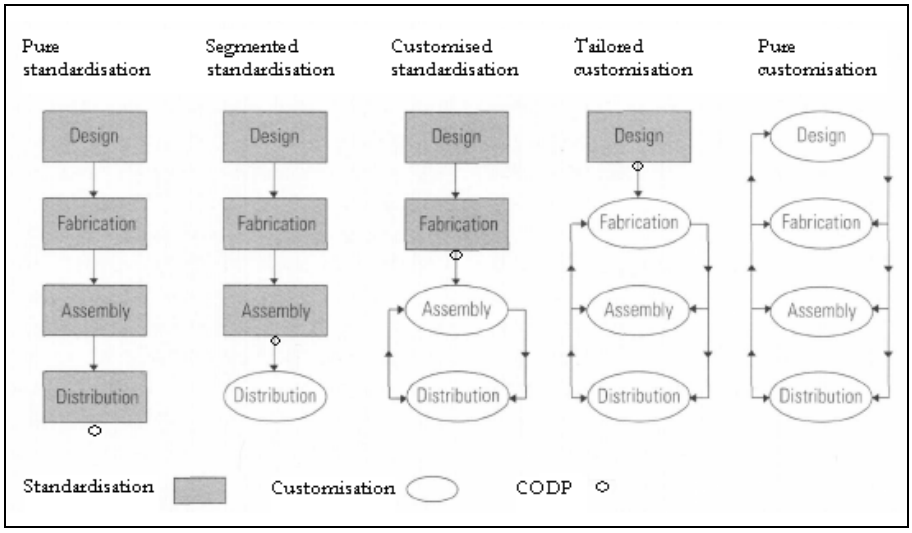


Figure 3.2 A continuum of strategies and customer order decoupling point (CODP). Adapted from Lampel & Mintzberg (1996:24).

The division between customised activities and standardised activities is conceptualised as the customer order decoupling point, CODP (Figure 3.2), which has implications for operations management (Olhager 2003). Different strategies imply different logics and procedures in the order fulfilment process. Pure standardisation strategy means that the whole supply chain is decoupled from customer orders and is fully forecast-driven. Segmented standardisation is decoupled from customer orders before the distribution activities, and so on. The CODP decouples the supply chain with a buffer such as an inventory because manufacturing strategies before it are based on speculation of demand and supply and those after it are based on customer orders. The continuum of strategies has different implications for customer service, manufacturing efficiency and inventory investment (Olhager 2003). While operations management literature on CODP omits non-physical customisation strategies (Rudberg and Wikner 2004), mass customisation literature draws on any means of customisation in order to create customer-unique value (Gilmore and Pine II 1997).

Gilmore and Pine II (1997) elaborate on non-physical customisation strategies as four faces of customisation. These are collaboration by conducting a dialogue with individual customers, adaptive customisation by users of a standard product, cosmetic customisation in delivery, where a standard product is presented differently to different customers by packaging, and transparent customisation, in which offerings are based on buying behaviour but offered as standard products. It is only collaborative customisation that involves customised production or engineering for a customised product; the other types are more about perception of product and service. This means that even

Lampel and Mintzberg's pure standardisation value chain could apply extensive customisation, in terms of adaptive, cosmetic and transparent customisation, by involving the customer in the value chain together with preparations and services for the interactions (see, e.g., Kaplan 2002). Such types of customisation can be altered in a short-term perspective, while changing position of the CODP in the value chain (see Figure 3.2) implies a value chain reconfiguration, which might be a radical change only possible in the long-term perspective.

In customisation strategies, the right-hand strategies in Figure 3.2, the main part of the value chain is configured to be customer responsive. Firms focus on customers and sensemaking of them, and particularly for future innovation, this customer orientation is based on firm and customer interactions (Webster 1994). Customer responsiveness is achieved by postponement of value-adding activities until the order is received, i.e., after the CODP. The customised standardisation strategy corresponds to a build-to-order strategy (Rudberg and Wikner 2004). The objective of a build-to-order strategy is to meet the requirements of individual customers. The needed flexibility is facilitated by outsourcing and information technology (Gunasekaran and Ngai 2005). Outsourcing of different activities increases specialisation of the actors and thereby interdependencies among the actors in the supply chain. Information technology is used to bridge the gap that is created between the interdependent, specialised actors, and especially to keep the supply chain customer-oriented and improve its flexibility.

Supply chain flexibility is crucial to align production to customer demands and involves flexibility in distribution, final assembly, fabrication of components and modules (Fredriksson 2002). For customisation, Duray (2002) says that modularity is a critical aspect because it restricts the range of choice, reduces the possible variety of components and thus allows for repetitive production.

Lampel and Mintzberg (1996) discuss the degree of customisation in order to achieve mass customisation with scale volume and customised offers. The degree would be determined by balancing advantages from the logic of aggregation and the logic of individualisation. The logic of aggregation could be characterised as product standardisation, mass production and mass distribution, which are often misperceived as a conceptual whole (Lampel and Mintzberg 1996). The logic of individualisation is characterised by individual customer interaction with marketing, production and design in the value chain. Combining these logics in different degrees of customisation of the production process is shown in Figure 3.2, but additional degrees of customisation are possible.

Physically or non-physically, the product can vary from being a commodity to being unique, and the transaction can vary from being generic to being fully personalised (Gilmore and Pine II 1997; Lampel and Mintzberg 1996). The distinction of customisation, mass customisation, etc., is dynamic in terms of

who, what and how the strategies are executed. For example, Kotha (1995) shows that a firm can apply mass production in one production line and mass customisation in another production line, which is another way to combine and take advantage of the logics with continuous benefits of learning among these, indicating that mass customisation is a process. Duray (2002) confirms Kotha's findings and argues that the development depends on the type of firm, type of products (standard and custom) and approach to customisation. Different approaches are, for example, using modules, mutability such as using the same brackets for all motor types, late configuration and option bundling. Mixing standardisation and customisation thus involves possibilities but also problems.

Problematic combinations of lean and build-to-order strategies are seen when these develop into island solutions (Holweg and Pil 2001). The development processes of the strategies are different because of the multi-faceted interactions between information, physical flow and the complex rationales of supply-chain evolution (Holweg and Pil 2008). The described principles of customer ordered production are from a marketing and strategic management perspective. Next, I will elaborate on the explanations of principles that are prevalent in the logistics/SCM and the operations management literature.

SCM explanations of the principles

My perspective of logistics, SCM and operations management is formed by the assumptions of the industrial network approach, and I start from there in this section to discuss supply network dynamics and complexity, supply chain transformation and goal complexity. Then, principles are discussed of the concept of build to order on the basis of its content and its process, lean/agile as a continuum and, finally, a the matter of interaction rather than either/or. Then, principles that are specifically related to the automotive order fulfilment process and its practices.

SCM in relation to dynamic and complex supply networks

No business is an island but depends on interactions in networks of actors, resources and activities, which are means and objectives (Håkansson and Snehota 2006). Actors perform activities and control resources, activities use resources to change other resources. Resources are utilised in activities by actors. As the metaphor of network implies, these elements are connected: actors exist in relation to other actors, resources are combined with other resources and activities are linked to other activities as parts in processes. Thus, each element might be seen as a net and the three networks are interwoven in an industrial network (Håkansson and Johanson 1992). A supply chain is a limited part of a network, i.e., a level of analysis which includes three or more interlinked firms (Harland 1996a). SCM also involves action and is defined as

> "[t]he systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across business within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole." (Mentzer, Dewitt, .Keebler, Min, Nix, Smith and Zacharia 2001a:18).

This definition emphasises the strategic effort to coordinate parts as well as the whole towards improved performance. Consequently, the supply chain might be seen as an organisation "*whose participants are pursuing multiple interests, both disparate and common, but who recognise the value of perpetuating the organization as an importance resource*" (Scott 2003:28). In order to enforce a line of action, different actors might, among others, develop coalitions that enhance their resources and potential to influence others in the supply chain (Borgström and Hertz 2007b). The supply chain/network involves autonomous firms as parts within it and in concurrent supply chains willing to organise for certain purposes, which leads to integration in different dimensions over time. Strategic commitment to integrate is key to achieving a structure for effective use of its parts (Lambert et al. 1998; Mentzer et al. 2001a).

The complexity of supply chain integration is conceptualised in Cooper, Lambert and Pagh's (1997) framework in terms of a supply chain's structure, management components and processes (Dam Jespersen and Skjøtt-Larsen 2005; Lambert and Cooper 2000; Lambert et al. 1998; Spens and Bask 2002). The structure in different relationships regards degree of integration. The management components are partly physical/technical components, such as degree of cooperative planning, and partly operational/behavioural components, such as type of power structure. Business processes involve product flows, information flows, knowledge flows and cash flows (Lambert et al. 1998) such as, for example, order fulfilment, customer service and product development (Dam Jespersen and Skjøtt-Larsen 2005). Objectives are negotiated by necessity because one firm's business process is extended to other supply chain firms. The Cooper, Lambert and Pagh framework is comprehensive and involves complexity but is also static. The richness in points of holistic supply chain management is useful for evaluative purposes, but what about time?

My study relates to an order fulfilment process in which different organisations are linked. In the SCM framework this would be contextualised by supply chain structure, management components and processes related (Cooper et al. 1997). But how are they related? Do the categories influence each other or are they actually parts of each other, or is the framework too abstract to be of any use? The framework is problematic because of dynamic dependencies (Dubois, Hulthén and Pedersen 2004). Any supply chain process is likely to shift in character along the supply chain (Lambert et al. 1998). It might be intertwined or disconnected but seldom a straight pipeline. In practice, the organisations have diverse processes. For example, the main

activities of tier one might be organised in eight processes and those of tier two in five processes, while the focal firm cannot see its activities in processes at all because its view is functionally based (Lambert et al. 1998). This mismatch of processes has not occurred as problematic in earlier studies but might be a reason for some problems related to supply chain coordination. In order to understand development in supply chain processes, the dynamics and complexity involved are important (Nilsson 2005). Strategic supply chain initiatives depend on what is but also on what happens. Few, if any, strategic initiatives can be developed without taking changes of interdependencies into account.

Thus, context forms action and action forms what part of context matters. Over time different interdependencies are likely to shape the development. Based on this, the supply chain management framework restrains further understanding of strategic supply chain development. The industrial network approach offers a more fine-grained level of analysis in order to see the change rather than the outcome of the change. With that perspective, a supply chain structure is made up of actors that have relationships to each other. Actors are individuals, parts of firms and groups of firms, and actors at lower levels of organisations can be parts at higher levels (Håkansson and Johanson 1992). Supply chain processes are networks of activities that are dynamic and interrelated and performed by an actor or a resource. The supply chain components are strategic initiatives seen as forces that bind actors, activities and resources together. For example, heterogeneity and subsequent functional interdependence is a binding force, power relations another, as well as knowledge and experience of networks. What matters is the interaction in relationships, but the richness of these has the consequence that much is discarded when an aggregate view of relationships is required (Easton 1992). Relationship behaviour is an aggregate of interactions that are the here and now of relationships, i.e., the dynamics of relationships. Thus, the industrial network perspective has a micro perspective that enables understanding of strategic supply chain development.

The dynamics in industrial systems is conceptualised by Johanson and Mattsson (1992). It is based on the network of relationships between actors and the production system of resources and activities (Figure 3.3). The actors are interdependent on each other in exchange relationships and they control resources that are interdependent in the process of activities in the production system. The network level and the production system are assumed to have a circular causal relation, which implies that dependencies gradually become stronger (Johanson and Mattsson 1992). It is the interaction in business networks that leads to a process of learning and systematising actions via the interdependencies (Håkansson and Ford 2002). The processes are sequences of actions, key transition points and focal actors (Pettigrew 1997) for network change as well as for stability (Håkansson and Ford 2002). The Johanson and Mattsson framework regards the industrial firm network to which the final

customer is eventually linked. The final customer, in line with other customers in this network, is perceived to influence both by exchange processes and by the process related to the production system. Customer value is important to both these processes and might be conceptualised as an appreciation of differences, primarily in costs and performance (see, e.g., Anderson 2004; Anderson and Narus 2004).

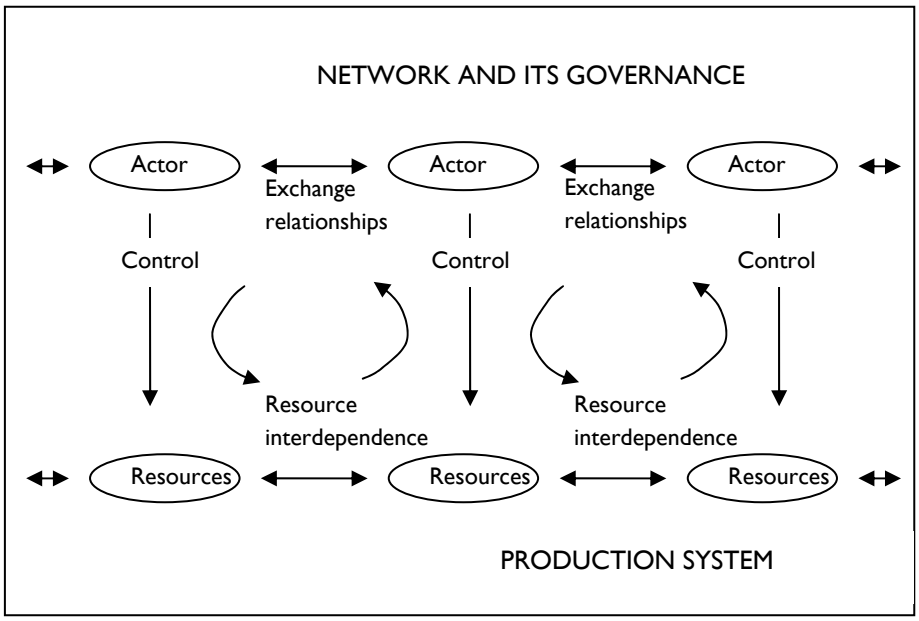


Figure 3.3 The industrial system. Source: Johanson and Mattsson (1992).

The Johanson and Mattsson framework is analytic rather than prescriptive. This is based on an assumption that development is similar to a testing process and can be done more or less thoughtfully and efficiently. Strategic action relies on interactions that will always depend on a specific situation and context. There are no standardised approaches to strategic network success (Håkansson and Ford 2002). Frameworks such as that of Cooper, Lambert and Pagh (1998) stylise principles, pinpoint gaps and are for inspiration. An analytical framework facilitates exploration and a customised approach to development. An analytic SCM framework is about coordinating to achieve supply chain integration, which is a process of coordinating activities, resources and organisations (Hertz 2001), and for this reason the Johanson and Mattsson framework would work.

Supply chain transformation

Integration means more than putting together pieces into a whole. An integrated supply chain structure has behavioural consequences, for example,

regarding ease of communication (Schary and Skjøtt-Larsen 2001; Stern, El-Ansary and Brown 1992). An integrated supply chain tends to change continuously because of dynamics and complexity, which the strategy of supplier base reduction might illustrate: within the automotive industry, supplier base reduction is used to organise suppliers into hierarchies (Essig and Arnold 2001; Lamming 1996). The direct supply base of the OEM is reduced but the number of suppliers is the same in a different network constellation. Thus, from the OEM's perspective, the supply chain is more integrated towards fewer actors while it is disintegrated with regard to other actors. A reason for this is the great difficulties involved in coordination and cooperation.

Coordination and integration in an organisation are complex as interests differ across the traditional functions. The complexity regarding interorganisational coordination is the same but different. It is other decision makers and other interests that drive the integration, which might conflict with the intraorganisational decision makers' intent (Gunasekaran and Ngai 2004; Sarkis and Talluri 2004; Yusuf, Gunasekaran, Adeleye and Sivayoganathan 2004). Integration involves a process of change (Hertz 1992). The interorganisational integration process is made up of coordination between two parties, i.e., at the dyadic level, of which the network coordination is a resultant (Easton 1992). Hertz (1992) suggests that integration is a key function to increase effectiveness "…*through reduced redundancy and duplication in the resources used to fulfil a certain activity chain, to prevent duplication of activities as well as to achieve mobilisation of resources"* (p. 108).

Is more integration better than less? The choice of process as well as the level and depth of integration in a chain is of great importance (Dam Jespersen and Skjøtt-Larsen 2005). The assumption in the SCM field that integration leads to supply chain efficiency and effectiveness has been criticised (Bagchi, Chun, Skjøtt-Larsen and Soerensen 2005a) because integration is more than a unifying act. First, it is a process of different transition points from looser to tighter integration. Also, the functional scope of what functions to involve might vary and has implications. In addition, the content of integration matters. For example, investing in an IT system for the purpose of facilitating information exchange with particular customers will increase integration but has implications for various functions in the organisations involved and it might be implemented for cost reasons or for time pressure reasons, or both. Thus, integration is an investment, it is a resource committed beyond what is needed to execute current exchanges, and it is associated with acquiring knowledge of the technical, administrative or logistical characteristics of a partner (Easton 1992). Investments are decided upon both on the level of exchange relationships and on the production system level (Figure 3.3). Therefore, the question of more or less integration depends on the situation of other investments, opportunities and problems.

Goal complexity

SCM aims to improve efficiency and effectiveness. Investments in the network and learning about the interdependencies in activities and resources in order to guide development are suggested to be the basis of the logic in supply chains and networks (Håkansson and Persson 2004; Thompson 1967). How to implement that will always depend on the specific situation and context (Håkansson and Ford 2002). Efficiency and effectiveness are often regarded as independent constructs (Pfeffer and Salancik 1978): efficiency is an internal standard of utilisation performance while effectiveness is an external standard of fit. In supply chains, seen as activity systems, the constructs are interrelated, because effectiveness is negotiated in strategic relationships and efficiency is in relation to effectiveness rather than to usage rate of resources (Borgström 2005). The supply chain's sequential and pooled interdependencies are the key to achieving economies of scale and scope while reciprocal interdependencies of mutual exchange of inputs and outputs between two parties are the key to improving innovation and agility (Håkansson and Persson 2004).

Goal complexity is well known in strategic management research; profit-maximising goals are presumed in economic theories while social theories presume that plural goals coexist (Whittington 2001). Different actors in a supply chain or a network are likely to create a bundle of strategic priorities. It is possible that goals on different levels develop differently and that continuous interaction in relationships calls for and directs emergent strategic choices. Interactions form relationships and vice versa, which affects the processes of strategising (Hall 2003), i.e., "*the detailed processes and practices which constitute the day-to-day activities for organizational life and which relate to strategic outcomes*" (Johnson et al. 2003:14). In an interorganisational setting, development goes on among actors giving input to it in different arenas (Nordqvist 2005), and strategies are seen to emerge in dialogues within and across organisations. These dialogues provide the situational context and act as a basis for further development, including setting strategic outcomes.

More specifically, the inter-firm relationship is a mutual orientation of two firms towards each other (Johanson and Mattsson 1987). Activities are seen as processes which are not entirely separable from past and future activities. Interactions in the relationship are either exchanges or adaptations (Håkansson 1982) and part of a process of enhanced involvement in the relationship. The adaptation process is gradual and mutual; Johanson and Mattsson (1987) state that these adaptations are a result of day-to-day experiences and occur through continuous processes. Thus, the strategic process is based on rational planning among actors that are aware of management concepts as well as emergent objectives formed by interactions in a relationship (Mintzberg and Waters 1985).

Johanson and Mattsson's (1992) conceptualisation of the industrial system with interdependencies between the production system level and the governance level of business relationships illustrates actions from the

governance level and the production system level that interact in industrial networks (Figure 3.3). The production system interactions and the network level interactions are the basis for strategising. Potentially, the business level has more responsibility for exchange processes and the production level more responsibility for the adaptation processes, but both types of processes take place on the different levels and are interdependent. Still, efficiency and effectiveness might have different meanings to actors on the business level and on the production level, and goals on these levels might support or be in conflict with each other.

Thus, I have accounted for how an industrial network involves network dynamics and complexity and argued that a supply chain transformation will be marked by goal complexity, directed by different strategising activities. But an industrial network also involves stability. The complexity and the interdependencies are managed by stabilising actions, such as investments in relationships and routine procedures to handle interactions.

The concept of build to order

The success story of Dell Computers is often told to give meaning and inspiration to the build-to-order strategy. The build-to-order supply chain is illustrated by Dell building customised computers in their order fulfilment process, with the objective of meeting the requirements of individual customers by leveraging the advantages of outsourcing and information technology (Gunasekaran and Ngai 2005). The build-to-order supply chain can be defined as the configuration of firms and capabilities of the supply chain that support a higher level of flexibility and responsiveness to changing customer requirements in a cost-effective manner (Gunasekaran 2005), which is of special importance in the auto industry (Holweg and Pil 2004).

Thus, outsourcing and effective information exchange are means for a cost-effective supply chain responsiveness. But how will these come into play? Gunasekaran and Ngai (2005) reviewed the supply chain build-to-order literature, focusing primarily on strategies and tactics. The review revealed on the one hand a lack of social elements, such as how supply chain people design, control and implement a build-to-order strategy and on the other hand a knowledge gap of the dynamics and complexity involved in the trade-off between responsiveness and the cost of logistics. This knowledge gap corresponds to both strategic content and strategic process. The strategic content of either responsiveness ends or costs ends is heavily debated in this paradigm and I will take off from that discussion because it has implications for the explanations of the paradigm regarding COP. Then responsiveness issues related to strategic process are discussed.

The either/or debate of strategic content

A grand debate has erupted whether firms should pursue either responsiveness or costs or if they should strive for both (Schmenner and Swink 1998). In the operations management field the argumentation is: on the one hand, a manufacturing plant faces a trade-off because it cannot outperform competitors with the highest levels of product quality, flexibility and delivery while at the same time maintaining the lowest cost. On the other hand, capabilities might be cumulative so that improvements enable other improvements (Schmenner and Swink 1998).

Hayes and Wheelwright (1984) were among the first authors to address the issue of trade-offs versus synergies in manufacturing performance, building on the work of Skinner (1969). However, Skinner argued that decisions made, related to manufacturing practices, had implications for the strategy, while Hayes and Wheelwright's thesis was that a set of best practices would lead to world-class manufacturing. Thus, Skinner (1969:142) argued that making manufacturing-related choices is an ongoing task needing explicit recognition because the variables of cost, time, quality, technological constraints and customer satisfaction are forced by the subsequent compromises, but Hayes and Wheelwright (1984) explicitly advise against the pursuit of multiple competitive priorities. Ferdows and De Meyer (1990) suggest that the nature of trade-offs depends on certain factors and they experience that firms improve in a cumulative manner rather than exchanging one capability for another. They argue that capability development is by a cumulative trajectory involving quality, dependability of the production system, production flexibility and cost efficiency (later, innovation is added, see Hayes, Wheelwright and Clark 1988). However, the order in the development of cumulative capabilities is too complex to be limited to a sequence (Flynn and Flynn 2004). An influential conceptual contribution was that of order winners and qualifiers that are market-specific and time-specific (Hill 1993). Hill describes innovative products' winning criteria to be the service level provided, while qualifying criteria are price, quality and lead time. For commodities, price is the order winner, and availability, quality and lead time are qualifiers. The simplicity of these concepts has appealed to many to include them in their theorising, but then the specificity that is likely to provide dynamics is seldom involved.

Schmenner and Swink (1998) argue that the debate originates in poor theories and that better definitions are needed. They draw on economic theory in order to demonstrate "all the hallmarks of the familiar theories of natural science" in a theory that explains both lines of the argumentation at an abstract level. Against that, recent authors have developed their own descriptions of world-class manufacturing practices, building on practices such as quality management and JIT (Flynn, Schroeder and Flynn 1999). Flynn et al. (1999) state that Hayes and Wheelwright's best practices still hold but are improved if they are used in concert with new practices such as JIT, and they also find strong evidence of synergies from a combination of practices that

simultaneously relate to cost, quality, dependability and flexibility (see, e.g., Krishnamurthy and Yauch 2007). However, Flynn et al. (1999) also say that the potential for trade-offs exists depending on type and content of practices related to the different initiatives, which seems to be in line with Skinner's thesis in 1969. The dynamics and complexity related to a plant's performance break through the neat laws that operations management aims to reach.

Supply chains are likely to involve even more dynamics and complexity. In spite of this, most supply chain literature takes the trade-off as a given, based on Fisher's (1997) seminal matching principles saying that a functional product needs an efficient supply chain while an innovative product needs a responsive supply chain. Over time, research into lean and agile management principles has led to revisiting the trade-off (Christopher and Towill 2002; Christopher and Towill 2000; Goldsby, Griffis and Roath 2006; Lee 2002; Mason-Jones, Naylor and Towill 2000b; Reichhart and Holweg 2007; Sebastiao and Golicic 2008), and the debate goes on, now more related to supply chain capabilities than to manufacturing capabilities (Reichhart and Holweg 2007). The either-responsiveness-or-low-costs debate resonates with discussions of either customisation or standardisation and of either agility or lean. The middle-ground dynamics of customisation/standardisation has already been discussed. Next follows a process view in order to involve dynamics and complexity also related to responsiveness/costs and thereafter a discussion of agility/lean.

Continuing the debate: responsiveness issues over time

It is reasonable to define responsiveness as a distinct concept rather than as the antithesis of costs. Reichhart and Holweg (2007) synthesise the literature on manufacturing and supply chain flexibility and responsiveness in order to define supply chain responsiveness. Supply chain responsiveness is defined in the following way: "*The responsiveness of a manufacturing or supply chain system is defined by the speed with which the system can adjust its output within the available range of the four external flexibility types; product, mix, volume and delivery, in response to an external stimulus, e.g., a customer order*" (Reichhart and Holweg 2007:1149). Product flexibility means ability to introduce new products or changes to existing products. Mix flexibility denotes possibility to alter the product mix (within the existing product range) that the system delivers. Volume flexibility signifies how the system's aggregated output is changeable, and delivery flexibility stands for potential to alter delivery agreements (e.g., shortening lead times or even changing the destination of the products). Especially for in-sequence delivery arrangements, such as in the automotive component industry, delivery flexibility also includes the ability to make changes to the agreed delivery sequence (Reichhart and Holweg 2007). Such changes have implications for cost efficiency of the supply chain. Thus, responsiveness and costs are distinct but interrelated phenomena.

Responsiveness is an investment. The resulting responsiveness might be either potential or demonstrated depending on the usage (Reichhart and

Holweg 2007:1149). The potential or demonstrated responsiveness might shift over time as the types of responsiveness (product, volume, mix and delivery) might communicate across different time horizons. It is reasonable to assume that responsiveness involves a risk of costs when the potential responsiveness is not demonstrated in a time period.

The flexibility types relate to machinery, material handling, operations, routing, expansion, program etc. For example, a question based on these different types of flexibility is "being flexible to what?", meaning that the aims of different types go in different directions (Koste and Malhotra 2000). Also, the flexibility of production factors, for example, a shift from unskilled to multi-purpose skilled labour can enable additional flexibility to respond to customer demands, which means that flexibility can be used in a productive way and be cost-effective. Thus, the different objectives imply that the trade-off would be either flexibility or flexibility, because one type of flexibility sometimes needs to be compromised against another type of flexibility instead of against costs. So, in this way responsiveness includes supply chain dynamics and complexity: responsiveness in the supply chain results from flexibility in the supply chain's different parts and it is cost-efficient only when the potential and the actual responsiveness are aligned implying that the time horizon matters (Reichhart and Holweg 2007).

The agile and lean continuum

Supply chain responsiveness is a core concept of various operations strategies, such as lean, agile and build to order (Reichhart and Holweg 2007). Sometimes lean and agile are seen as rival strategies (see, e.g., Goldsby et al. 2006 for a description of lean, agile and leagile strategies). Lean aims to apply the methodology of Toyota Production System to any mass-producing organisation for improved value creation (Hines, Holweg and Rich 2004; Womack and Jones 2003; Womack, Jones and Roos 1990); agile draws on and adds to lean with the ability to manage and apply knowledge effectively in order to respond to change and uncertainty via professional employees and cooperation (Bernardes and Hanna 2009; Cerruti 2010; Christopher and Towill 2000; Ebrahimpur 2002; Goldman and Nagel 1993; Håkansson and Persson 2004; Krishnamurthy and Yauch 2007; Yusuf, Sarhadi and Gunasekaran 1999; Yusuf et al. 2004). Even those who argue that there is a lean/agile conflict see this as escapable by defining business-specific conflicts through data analysis and dialogue (Christopher 2000; Stratton and Warburton 2003).

Common to all of these strategies is the importance of customer-oriented pull systems, as opposed to forecast-based mass production systems. Crucial aspects of build-to-order supply chains are by definition flexibility and responsiveness. The dialogue leading around the lean/agile conflict is portrayed in different ways. For example, postponement of supply chain activities is used to customise without long delivery times (van Hoek 1998); upstream activities are managed by lean principles and downstream by agile. Postponement was

first suggested by Alderson (1950), followed by Bucklin (1965), and became popular in SCM literature in order to propose innovative supply chain solutions. Also, mass customisation is a form of postponement to create customer-unique value at the lowest possible cost, such as customisation in the product design, in the production, in the delivery or in the use (Gilmore and Pine II 1997), that relies on modules of the product and production process that might be combined differently based on individual orders (Feitzinger and Lee 1997).

In a similar way, in the concept of leagile that denotes hybrids of the lean and agile approaches, inventory is used to decouple the agile part and the lean part of the supply chain (Mason-Jones, Naylor and Towill 2000a; Mason-Jones et al. 2000b). However, the leagile approach relies on the either/or assumption of a homogeneous set of customers that prioritise either cost or availability, while mass customisation relies on practices to achieve cost-effective responsiveness in different combinations. In yet another way, Stratton and Warburton (2006; 2003) draw on Gattorna and Walters (1996) in addition to their own case study to explain how supply of a stable base demand for a product may be separated out from a potential demand surge by splitting early and late production. For example, their case study shows that a minor part is made by the case company, Griffin Manufacturing Co., and a major part is supplied by a low-cost source in Honduras. Operational conflicts created by, for example, an outsourcing decision are difficult to appreciate in terms of strategic issues beyond direct costs. Buying from a low-cost country far away will have implications for quality, responsiveness and the service level, which might end up as high-cost supply chain outcomes (Christopher, Peck and Towill 2006).

Often, different objectives are discussed in the literature, such as product quality, speed of delivery, dependability of delivery, the possible variety of products and manufacturing costs. These objectives are mere monitoring points that express little of perceived performance, holistic performance or financial results. Sometimes the question "trade-off by whom?" is more interesting than "what trade-off?". The people involved, and various intra- as well as interorganisational performance aspects, such as working capital or sustainability, impose dynamics in the trade-offs (Christopher et al. 2006; Da Silveira and Slack 2001). Different trade-offs may have common sources, effects and management strategies, and such complexity is difficult to study in surveys as is often the case in the operations management field (Da Silveira and Slack 2001). One source of customer-driven strategies is the continuously increasing number of variants that make a forecast-driven strategy unlikely to succeed, and another source of customer-driven strategies is the pressure for short or immediate delivery times. Combining these demands imply that for right-away delivery of all possible Mercedes E-Class variants, more than three septillion (3×10^{24}) variants should be in held stock (Pil and Holweg 2004). Thus, firms need to cope with changing customer requirements in a cost-

effective manner, supported by flexibility and responsiveness (Gunasekaran 2005).

Interaction rather than either/or

The different operations strategies are practices bundled for a reason, for example, increased value by lean practices. Based on the earlier discussion, the difference between a build-to-order strategy and other types of strategies is complexity related to the involved supply chain interdependencies. Also, the operations strategies involve a significant change in how people view their jobs, how they behave and how they are compensated for their behaviour together with an unlearning of other mental models. Targeting thinking, being and doing by a method brings in the practices in the performance rather than the selling label of lean, etc. Basic tenets in the discussion of trade-offs versus synergies in operations management are that practices lead to capabilities that lead to superior performance (Hayes and Wheelwright 1984). The relationship with financial performance has been difficult to establish, but the relationship between practices and capabilities comes easier (Flynn and Flynn 2004). Even so, operation strategists suggest that prescriptive suggestions regarding "should our plant adopt X?" will be answered with "it depends", and that complementary types of studies are needed (Ketokivi and Schroeder 2004:185).

Examples of different order fulfilment practices are postponement, modularisation, the use of "frozen horizons" and quantity flexibility contracts (Reichhart and Holweg 2007). On the basis of specific practices and interactions there is potential for lean and agile outcomes, but specific actions change the situation (Christopher et al. 2006). Storey, Emberson and Reade (2005) find that customer-responsive supply chains that work well are vulnerable to erosion of advantages because of a number of institutional factors that lead to competing priorities between collaborative interorganisational working on the one hand, and competing corporate strategies and ingrained routines on the other.

The social practices that guide action may be more interesting in order to learn about strategic dynamics and complexity than the distinct classifications. Such performance is complex, especially in the bigger picture of interrelated firms, multidimensional goals and different and simultaneous stakeholders. Many attempts at technical optimisation of performance rely on conceptual simplifications and lean on the either/or rhetoric, despite the fact that the empirical underpinning of the trade-off postulate is weak (Adler, Goldoftas and Levine 1999). Rather, the case of the National Industrial Bicycle Company of Japan, NIBC, shows how both mass production and mass customisation are pursued simultaneously, and NIBC not only copes with both approaches, it also cross-fertilises them via a system for knowledge creation (Kotha 1995). Further, the trade-off debate in the literature, simultaneously in different fields, limits actionable knowledge development (Kotha 1995). Actually, a trade-off is not the problematic issue for practicing managers that it is for academics; it is

an easily understood but dynamic concept that describes the operational compromises routinely made by managers (Da Silveira and Slack 2001). In that perspective, either/or choices are impossible but compromises are made routinely; can a compromise be a routine? And how can routines confront efficiency and flexibility? I will return to that issue with reference to Adler, Goldoftas and Levine (1999) on how the practices function and relate to the outcome, after a discussion about the order fulfilment process.

The automotive order fulfilment process

The automotive order fulfilment process has been mapped by Holweg (2003) from order entry to product delivery. The study comprises six European volume manufacturers with production facilities in the UK. A simplified order fulfilment process, as shown in Figure 3.4, starts with the order submission at the dealer. The order is submitted to the National Sales Company and is then sent on to the vehicle manufacturer's central order bank. There, the order awaits being scheduled for production at a particular plant, and once scheduled for a build week, the orders for the build week in question will be lined up in a sequence for production, and parts are called off from suppliers' inventory or production. After assembly, the finished vehicle is distributed to the dealer, and the order is fulfilled (Holweg 2003). In Figure 3.4 also the sales and operations planning, involving market, programming and purchasing functions, connects the parties, which to a certain extent frames the order fulfilment process. There are underlying forecasts which strongly influence the current system. The assembly is generally determined 2-3 months prior to the production period via the "production programme", against which actual customer orders might compete also in a build-to-order system (Holweg 2003). The programme becomes a forecast for the suppliers.

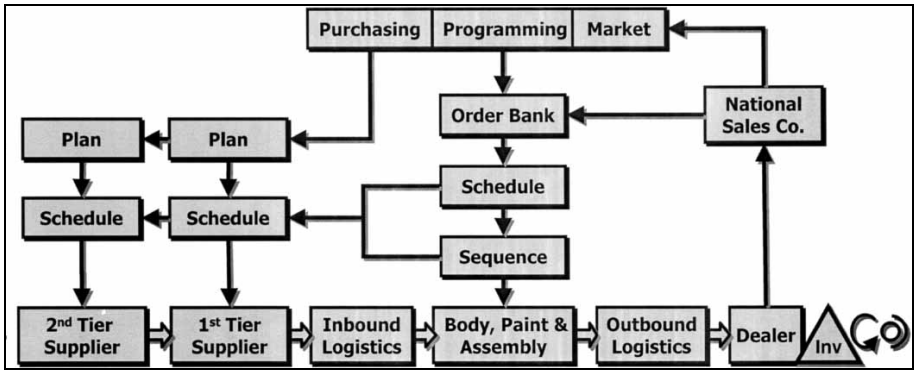


Figure 3.4 Simplified order fulfilment process. Source: Holweg (2002) in (Holweg 2003).

Schedule instability is seen as a significant cost driver in the supply chain; Reichhart and Holweg (2007) identify two major tools for limiting demand uncertainty contractually: for automotive manufacturers *frozen horizons* are usually 4-6 days in which the production schedule does not change, which substantially reduces the need for very short-term responsiveness; prior to the frozen horizon, a *quantity flexibility contract* can be used to set upper limits for possible changes in order to reduce allowed changes. Uncertain and variable demand can require product, mix, volume and delivery changes. Each type of responsiveness might relate to different practices, and if, for example, two change, even if it is proportionally, then the performance will change (Reichhart and Holweg 2007).

The order fulfilment processes that Holweg (2002) studied make vehicles to stock, which is seen in the inventory levels in the marketplace (Figure 3.5). It is also interesting that a second CODP is seen at the first-tier supplier, who uses inventory as a buffer against variability of demand and batch-driven production as well as against inflexible second-tier suppliers (Holweg 2003).

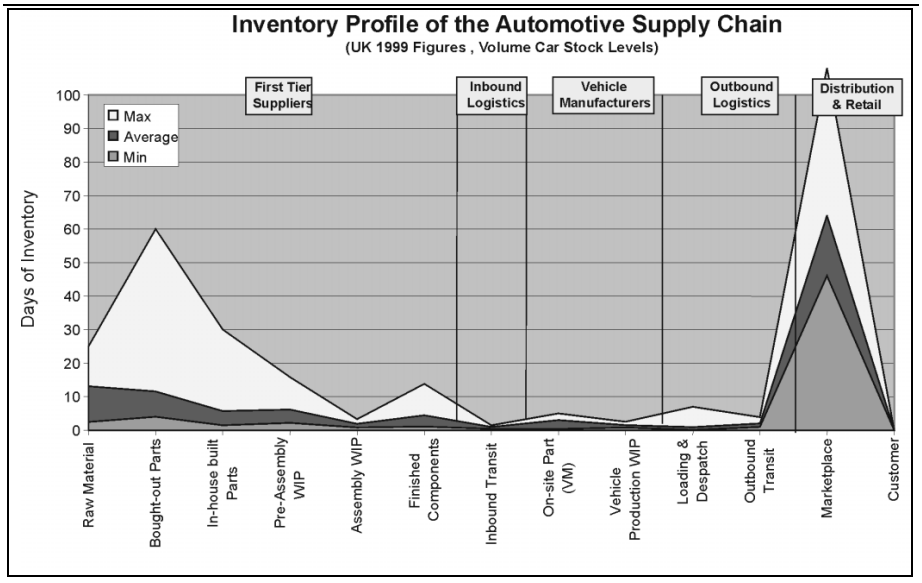


Figure 3.5 Stock levels across the automotive supply chain. Source: Holweg (2002) in (Holweg 2003).

A stock increases responsiveness to customers' demand in a short-time perspective, but not necessarily in a long-term perspective when it comes to product development and launching new models. Then the customised supply chain is needed to learn about customers (Kotha 1996).

Practices in the order fulfilment process

In order to understand obstacles to attaining both efficiency and flexibility and to learn how to overcome them, Adler et al. (1999) studied flexibility at a Toyota subsidiary, an auto assembly plant in California with a focus on agility in major model changes. The auto assembly plant was highly efficient but at the same time very flexible to engage in non-routine tasks. In comparison with other American auto assembly plants, the differences were ascribed to the working procedures of meta-routines, switching, enriching and partitioning (Adler et al. 1999).

First, routines for changing other routines, so-called *meta-routines*, were applied. These are standardised procedures for changing and creating new routines such as, for example, a procedure for problem solving or a procedure for reflection and review. Second, both workers and suppliers contributed to non-routine tasks while working in routine production. By *enriching* their tasks and implementing their ideas, they improved the routines. Third, routine and non-routine tasks were separated temporally, and workers *switched* sequentially between them. Model changes relied on participation of knowledgeable workers and suppliers during and after the project. Pilot runs were adaptive and an opportunity for learning. Finally, novel forms of organisational *partitioning* enabled subunits to work in parallel on routine and non-routine tasks. Temporary teams developed assignments with mutual adaptation to different functions in the organisation and to suppliers. The Toyota subsidiary, involving also the suppliers, increased efficiency and simultaneously learned and used creativity over time.

Kohn Rådberg argues that Volvo Cars was an example of how routines could be enforced to only work for increased efficiency (2005). The Toyota meta-routines increased the efficiency of a given level of flexibility, while enriching, switching and partitioning increased innovation and thereby both flexibility and improvement of ongoing operations (Adler et al. 1999). At the Toyota subsidiary in California, meta-routines together with routines for efficiency and flexibility were used to explain a behaviour that permitted agility and led to superior performance in efficiency and flexibility in relation to other auto assemblers (Adler et al. 1999). The exploration seems to originate in mindful practices because the explanation suggests that production both relied on and forced high levels of mindfulness in routine production; this is in line with what Kotha describes as knowledge creation through interaction between mass-customisation and mass-production systems (Kotha 1995). Feldman and Pentland (2003) argue that meta-routines are sometimes used as a synonym for an operations strategy such as total quality management and are seen as a mechanism for dynamic capabilities much in line with practice-performance literature but that every routine can, by its ongoing performance, result in change.

Mass customisation could be seen as a meta-routine. It is described as a mediator between low costs and responsiveness by Duray (1997), who argues

that mass customisation can be categorised based on the degree of customisation and modularity. Modularity can be achieved in different ways, for example by sharing common components, by swapping options on a standard product or by re-arranging components. It is modularity that provides the "mass" component of mass customisation as modules are customised. Duray identifies four configurations of mass customisers based on different types of module use and degree of customer involvement: mass pure, mass tailored, mass standard and point of sale. Customer involvement is based on the concept of customisation, Figure 3.2 (Lampel and Mintzberg 1996) and equals the customer order decoupling point. This means that practices related to module use and to customer involvement make up the performance of mass customisation. Table 3.1 illustrates some differences that Duray (1997) identified when comparing different types of mass customisers. Duray (1997:205) defines mass customisation: "*A mass customized product provides end-user specified customization achieved through the use of modularity of components".* For example, both Dell and Levi Strauss fit this definition in different ways. Dell is categorised as 'mass standard', and uses modules, while Levi's is categorised as 'mass tailored' and tailors a common pattern to fit each customer's measures, but the basic style is the same.

What is interesting in Table 3.1 is that the strategy becomes a result of certain practices of customer involvement and use of modules for product variety, which might change over time. Duray notes that there exist high performers in all types of mass customisers but not whether these change as a type over time.

Table 3.1 Type of mass customiser and typical practices (Adapted from Table 3.3 in Duray 1997:55)

	Mass pure	Mass tailored	Mass standard	Point of sale
Customer involvement in value chain	Design	Fabrication	Assembly	Post production
Product variety	All unique, each product uniquely manufactured with modules	Unique fit, modules altered, then assembled into product	Combinatorial, modules assembled into products	Combinatorial, modules are finished units
Inventory	Raw	Raw/component	Component	Finished
Strategy	Make to order	Tailor to order	Build to order	Make to stock or JIT

Strategic development is vulnerable to erosion from dynamic behavioural barriers (Storey et al. 2005). Storey et al. studied a customer, Marks and Spencer, and a supplier, Courtaulds, that developed a well-functioning system for quick response in supply, which eventually fell apart. They suggest that one reason was that Marks and Spencer changed their organisational structure and

mindset and with that their objectives. They wanted, among other things, coordinated collections. Another reason was that Courtaulds changed their production structure and objectives towards off-shoring production in order to reduce costs, which was on their corporate agenda. Their supply became more difficult to coordinate, especially with the Mark and Spencer objective of collections. Thus, corporate agendas make a difference.

Supply chain relationships, built at a more operational level, are vulnerable to changes in corporate policy. Established and emergent practices are changed in the organisation, which suddenly has a new person with other ideas at an important position, or is changing priorities as negotiations go on internally and externally (Storey et al. 2005). Their findings are in line with the Johanson and Mattsson model in Figure 3.3, which suggests that the production system and the network and its governance are interrelated but might have different logics. The buyer/supplier relationships involve exchanges and adaptation in line with the Johanson and Mattsson interaction model (1987) that are developed mostly at the operational level. The operational level is in line with the peripheral strategy making: inductive, externally oriented and exploratory strategy making (Regnér 2003). In the automotive industry, a general concern is to increase customer responsiveness, and Holweg (2003) discusses that a root cause of the inability of current vehicle supply systems to provide responsive order fulfilment (see the performance illustrated in Figure 3.5) is a strategic misalignment of the internal order fulfilment process with external requirements. A reason behind this misalignment is to be seen in the historical development of forecast-driven mass vehicle production. In the study by Storey et al. (2005), corporate strategies interrupted collaborative relationships and supply chain development but it was also the other way around. And in the Holweg study (2003) there is legitimacy from history. The adaptive and creative strategy logics are both seen as basic strategy logics where the underlying procedures, activities and reasoning generate a particular type of strategy (Regnér 2005), but these might occur as misaligned in certain phases.

Summarising, at this point I have illustrated that principles in the literature get stuck in abstract descriptions while the performance is in the micro-processes and in the practices, such as meta-routines and routines that open up for explanations based on dynamics and complexity. Content and process issues are inseparable, since these are intertwined by the practices. The principles of customer ordered production from a logistics/SCM perspective add to earlier described principles discussing standardisation/customisation and build-to-order strategy in the increased complexity of involved interdependencies. The dynamics and complexity of an industrial network, and especially a supply chain transformation, is directed by different strategising activities and goal complexity. Also important, an industrial network involves stability of investments in relationships and routine procedures to handle interactions. The principles of customer ordered production derived from the logistics/operations management perspective add to the picture additional

dynamics, complexity and stabilising actions. The conceptual discussion argued that responsiveness might over time relate to low or high costs depending on business-specific conflicts. Responsiveness might come from outsourcing, information technology, postponement, modularisation and customisation in the product design, in the production, in the delivery or in the use, buffering through inventory or separation of product flows. However, none of these practices can promise either responsiveness or low costs as the outcome is situational. But, in addition to this complexity there are competing objectives and parallel happenings; these bring in additional dynamics and opportunities to shape the outcome. Some practices might be seen to alter the structure and the complexity of the order fulfilment process, such as postponement, modularisation, the use of "frozen horizons", quantity flexibility contracts and stock levels that are prone to achieving stabilisation; others relate to working procedures, such as routines/systems for knowledge creation, compromises and routines for changing other routines (meta-routines) that are prone to change. In such change a meta-routine can draw on practices that otherwise work to stabilise the content and process in strategic supply chain development. The dynamics, complexity and stabilising actions I have derived based on principles of customer ordered production from ostensive strategy explanations and SCM explanations might now facilitate a performative definition of customer ordered production where the practice of strategic development is partly seen as change and partly as stability (Figure 3.1).

Practice of strategic development

The development of COP as a build-to-order strategy could be seen as two aspects of strategy, in line with technology and technology-in-practice (Orlikowski 2000), and as a meta-routine with ostensive and performative aspects (Feldman and Pentland 2003). I will next discuss how a principle such as customer ordered production is infused with action that explains its development mostly in terms of change drawing on Orlikowski (2000) before I discuss that performance for change and stability is based on the same explanations, drawing on Feldman (2003) and Feldman and Pentland (2003).

Development as change

Orlikowski (2000) studies technology and technology-in-practice, which might be hardware, software and techniques. The concept of technology involves COP as a technique. Thus, *COP is a conceptual artefact*, and *the use of COP is COP-in-practice* or what people actually do with the artefact in their recurrent situated practices.

Use and appearance of the COP artefact

A concept like COP comes with a set of properties crafted by designers and developers. Also, COP is applied by users who to some extent choose how to interact with it. The typical and expected range of activities depends on what people do; by intent or by error the use might change or an artefact is added by another concept. In the performance, the dynamics of the moment gives new meaning to the use and therefore the dynamics is important to understand the happening. At the same time, the use is restricted: physical properties of artefacts define the use. Orlikowski (2000) explains that conceptual artefacts, such as COP, are more likely to be used in different ways than software-based artefacts, which, in turn, are more likely to be used in different ways than hardware-based artefacts. Likewise, a larger system or network in which the artefact is integrated narrows the range of alternative use. Standardised, interconnected and interdependent artefacts are less likely to be changed by use. Consequently, a supply chain concept that is integrated intra- as well as interorganisationally is less likely to change than a less integrated concept because of many complex connections. The use and value of technology is strongly influenced by users' understandings of a technology and these are strongly influenced by images, descriptions, rhetoric, ideologies and demonstrations presented by intermediaries such as journalists, champions, managers and "power" users (Orlikowski 2000; Orlikowski, Yates, Okamura and Fujimoto 1995), who emphasise the role of interpretation and perception.

Orlikowski (2000) proposes that technology-in-practice is a kind of structure and that Giddens's (1984) development of structures enacted in practice can be applied to learning about the structure of social action. People use a technology and draw on the properties of the technological artefact; these are partly in the materiality (real existence), partly inscribed by designers and partly added on by users over time. Also, people draw on their assumptions and knowledge of the technology, which involves emotional and intellectual meaning associated with technology and use. In practice, this constitutes the rules and resources that structure their social action. Also, other institutional contexts matter. Orlikowski makes a point of the fact that the institutional context where users live and work and the social and cultural contexts they participate in, structure people's use of technology. This knowledge and these experiences and meanings will structure people's use of technology. For example, if COP is the technology in use, then other institutional contexts might be different functions in the firm, customers and suppliers.

COP-in-practice as one of several structures

Because the performance of COP is situated in a number of overlapping social systems, people's interaction with COP will enact other social structures along with the COP. People's recurrent and situated actions enact the technology-in-practice and other structures and reconstitute the structure. This development might be deliberate or emergent: *reinforcement* is one way by which actors

reinforce rather than change anything, and *transformation* is another way by which actors enact changed structures within a range between modest and substantial changes (Orlikowski 2000). Technology is never fully stabilised or completed, and change is implemented by people influenced by competitive, technological, political, cultural and environmental aspects. Thus, people enact, influence, adjust or adapt by, for example, improvising and generating situated innovations in response to unexpected opportunities or challenges (Orlikowski 2000).

The role of social practices becomes clearer if strategic development is seen as a process of enactment through a structure. Actually, it is proposed that the value of a practice lens is to see what, when, where, how and why different groups enact different structures through their recurrent interaction with a particular set of technological properties, in similar and different contexts, at the same time and over time (Orlikowski 2000:420). Strategic development is seen through a practice lens, based on what people do with a concept, such as COP, in their everyday practices, and how such use is structured by rules and resources. Orlikowski (2000) draws on Giddens (1984) regarding the implications of such a study and to what extent the outcomes are generalisable. First, generalisations hold because people know them and therefore apply them, and second, the unintended consequences of agents' patterns of action are generalisable (Giddens 1984; Orlikowski 2000). Feldman and Pentland (2003) pursue a similar line of thought arguing that the development could be seen in terms of people knowing what COP is (ostensive aspect) and knowing how to work with COP (performative aspect), but their explanation of consequences is specified to patterns of action within routines and outcomes of routines from apparent to considerable stability.

The enactment process of COP-in-practice could be understood by how thechnologies-in-practice are enacted (Figure 3.6). Orlikowski (2000) draws on Giddens (1984), explaining that technology-in-practice is a structure, and that actors draw on their knowledge of their prior action and the situation at hand, the facilities available to them (e.g., software) and the norms that inform their ongoing practices, and in this way enact the "structure" (Figure 3.6). Furthermore, actors are a community of users who tend to engage in a technology in similar ways because they learn, coordinate and tell stories that become relevant. Technologies-in-practice coexist with other structures that interrelate with the one in foreground (Figure 3.6). Any structures are interpretations based on empirical material, that is, they are subjective based on action in a point of time. For example, Orlikowski studied "collective problem solving", and then both "individual and collective incentive structure" and "cooperative culture" can be and are changed together with the structure in the foreground. Actors experience changes in awareness, knowledge, power, motivation, time, circumstances and technology. Technology-in-practice is changed through the same process through which all social structures are changed – through human action (Orlikowski 2000:411). By studying

technologies-in-practice in order to explore what people do with technology in their everyday practices and how such use is structured by the rules and resources implicated in their ongoing action, it might be possible to understand change in conditions as well as consequences.

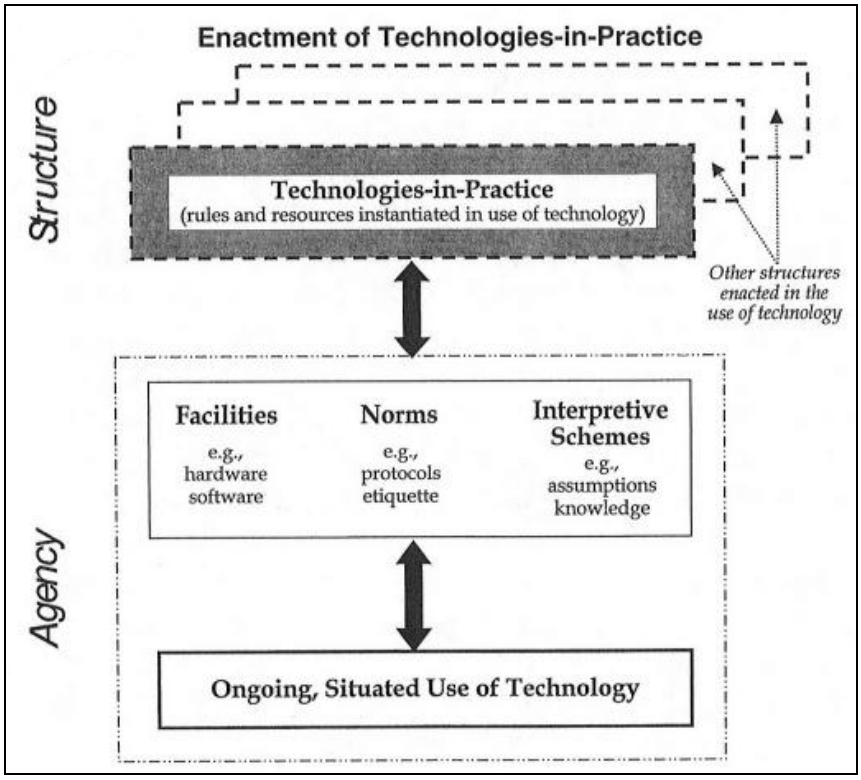


Figure 3.6 Enactment of technologies-in-practice (Orlikowski 2000:410).

COP, as an artefact, influences the enactment process of COP-in-practice that involves structures such as outsourcing, information technology or postponement and agency, which might be mindful or mindless in its use of "frozen horizons", quantity flexibility contracts and stock levels. COP might be reinforced or transformed in the enactment by people who are influenced by different aspects.

Development as stability

Traditionally, routines are seen to create inertia or at least contribute to inflexibility, but through the previous discussion it is clear that in practice they could be a vehicle to create change. In line with the mindful practices at the Toyota subsidiary in California (Adler et al. 1999) that were used to explain a

wanted behaviour, Feldman (2003) shows that mindfulness, rather than mindlessness, explains stability in spite of a requested change. Feldman's argument is that organisational participants use what they understand about how the organisation works to guide their performance during the routine; they draw on what seems relevant and choose whether to enact a requested change.

Individuals' and groups' patterns of action within routines might generate a wide range of outcomes, from apparent stability to considerable change (Feldman and Pentland 2003). An ostensive definition includes an idea and guidance, and a performative definition includes the enactment; as a whole, COP should be defined as interplay between variability and stability. Thus, strategic development might lead to change as well as stability.

Stability and change stem from the same dynamics, which is a recursive relationship between understandings and performances (Giddens 1984; Orlikowski 2000). Different actors create stability and change (Giddens 1979). Giddens's theory has been criticised, because it is difficult to apply to empirical studies (Berard 2005), and those that draw on Giddens's theory are criticised for excluding the analysis of contradictions of the consequences (Walsham 2002); Orlikowski's and Feldman's Giddens-based analyses show that the Giddens-based analysis is fruitful in that both produced seminal results. In Feldman's study (2003), which comprises organisational participants in a housing division of a large state university, a routine was supposed to be changed but stood out as the change that would not occur. It was one among others that were changed; managers were pushing the change and no one was against it. Consequently, Feldman suggests that stability can occur because organisational participants make conscious efforts to understand what actions make sense in the context in which the work is being performed (Feldman 2003). Furthermore, Feldman and Pentland (2003: 95) defined organisational routines as repetitive, recognisable patterns of interdependent actions, carried out by multiple actors; these are capable of change because the structures of routines and agency (with its subjectivity and power) interact.

Feldman (2003) discusses organisational routines, which from a stability and change point of view could be extended to interorganisational routines (Harrison and Huemer 2005). If the routines guide and are enacted by interorganisational actors and actors are knowledgeable of the routines as a structure and perform within these routines, then the routines apply to an interorganisational setting. Feldman (2003:745) argues that many different kinds of performance are possible, since performances are interdependent on each other. People draw on their observations and understandings of other performances in their action. In the light of interorganisational routines this means that a routine is influenced by the behaviour of a buyer-supplier relationship. For example, a buyer interacts with the supplier via several functions of both firms and it is likely that change and stability in routines occur because of these interactions (Feldman 2003:745). Different structures have different logics and dynamics, and each might affect how people perform

their work. Therefore, in a supply chain where one logic of mass production is appropriate in one part while another logic of customer orientation is suitable in another part, an ambiguous (from the point of one logic) performance might occur.

Table 3.2 Change and stability of a strategy

Dynamics	Mass production	Customer orientation
Conceptual artefacts have few physical properties (Orlikowski 2000). Material durability (Law 2007).	Likely to be used in different ways.	Likely to be used in different ways.
Integrated in supply chain (Orlikowski 2000). Discursive stability (Law 2007).	Distinct character narrows the range of alternative use.	Distinct character narrows the range of alternative use.
User's understanding (rhetorics, ideologies, images) from media, top management, owner, etc. (Orlikowski 2000). Durability by concurrent similar strategies (Law 2007).	Recession, etc.	General trend.

In the section on development as change, Orlikowski (2000) discusses that use might change or add to an artefact and that physical properties restrict use (Table 3.2). Law (2007) discuss the other side of change; what network configurations (the actor-network as a point of departure) lead to relative stability (Table 3.2). Law (2007) argues that, first, social arrangements of non-bodily physical form tend to hold their shape better than those that depend on face-to-face interaction, but it is the configuration of the actor-network that produces durability; this is material durability. A second durability is deliberate strategy together with translation of strategies of other networks; irrespective of how they work in one network, durability is enforced; further, also circumstances in nature, the social and the political add to strategic durability (Law 2007). Finally, discursive stability comes from the fact that discourses define conditions of possibility and limit the possibility to recognise others, i.e., certain kinds of realities. However, other realities exist, and the difference contributes to stability (Law 2007). If we assume a low-cost discourse and a responsiveness discourse, both exist and have to be handled. When one mode becomes problematic, others might become more effective (Law 2007).

Interorganisational strategising as strategy development in and of practices

My point of departure in this chapter was that ostensive definitions of COP are at hand from literature and that a performative definition needs to be

developed. The ostensive definitions form an artefact that might be referred to for guidance on customer-responsive strategies. On the basis of reviewed literature, COP's properties might be substantiated as in Table 3.3.

Ostensive definition
Frozen horizons, quantity flexibility contracts (Reichhart and Holweg 2007), stock levels (Christopher et al. 2006), dynamic supply trade-offs (Stratton and Warburton 2006; Stratton and Warburton 2003), meta-routines and other routines for mindfulness (Adler et al. 1999), negotiated production programmes (Holweg 2003) and degree of customisation and modularity (Duray 1997) are practices that are mentioned in the literature but not in relation to strategic development. The original properties of the ostensive definition were loosely outlined in opposition to a low-cost strategy and were thereafter substantiated by different cases, such as Dell, Levi Strauss, and Courtaulds. Thus, general principles of agility are defined, but much less of the practices representing its implementation path (Cerruti 2010).

Table 3.3 Elements of an ostensive definition of COP (summarising principles of COP)

Elements	Conceptual properties
Customer orientation	Towards individual customisation but under the influence of mass customisation principles (converging in, e.g., postponement activities). In the offer vs. in the future (development). A variant handling option.
Operational logistics	Planning and managing operational and collaborative activities in a customer-oriented pull system. Exchange interactions, such as social, business and information exchange. Adaptation interactions, such as product, production and routines adaptations.
Standardisation/ customisation	Non-physical and physical. Long-term vs. short-term adaptation.
Outsourcing of activities	Specialisation and increased interdependence. Separating flows of products for a stable base demand from surge demand (early/late, a minor flexible flow/a major inflexible flow).
IT support	Glue for specialised actors and interdependent activities.
Integration	Strategic decisions and negotiations within firms, involving functions such as market, planning and purchasing, and across firms, involving, e.g., sales companies, logistics firms and suppliers. Hard and soft investments. Efficiency and effectiveness among actors, resources, activities.
Responsiveness	The speed with which the supply chain can adjust product, mix, volume and delivery flexibility in a cost-effective manner based on customer requirements; might be potential or demonstrated. Responsiveness is of, e.g., outsourcing, IT, postponement, modularisation and customisation in the product design, in the production, in the delivery

	or in the use, buffering through inventory or separation of product flows.
Inventory	Used to decouple agile part of supply chain from lean part.
Modularisation	Building blocks for assembly to orders. Module use changes the chain of activities and, if a supplier is responsible for the module, also the degree of dependence in the relationship.
Mutability	Standardisation of parts in modules is a practice to simplify customisation.
Postponement	Late configuration and customisation based on customer orders.
Option bundling	Using modules with predefined combinatorial possibilities (Note, in order to mass customise, these bundles are finished products instead of modules).
Routines in order fulfilment process for customised products (exchange and adaptation)	*Frozen horizons* is an agreed time period before production in which the schedule does not change in order to facilitate short-time responsiveness/cost effectiveness. *A quantity flexibility contract* facilitates long-time responsiveness/cost effectiveness. *Postponement* and *modularisation* affect, in particular, the stock level of parts and modules, which is a buffer for customer orientation and for management of mismatched demand and supply. The modules are combined to achieve product variety and responsiveness.

The properties in COP are also parts in other structures, such as mass customisation, and are never fully stabilised or completed. Such overlaps cause dynamics, and change is implemented by people who are influenced by competitive, technological, political, cultural and environmental aspects. This is the kind of dynamics and complexity I have searched for in the literature (Law 2007; Orlikowski 2000; Schatzki 2005).

It is reasonable, based on the principles due to dynamics and complexity related to a customisation strategy, to assume that the degree of customisation varies over time (Duray 1997; Feldman 2003; Feldman and Pentland 2003; Gilmore and Pine II 1997; Lampel and Mintzberg 1996; Orlikowski 2000). There might be simultaneous types of customisation, such as collaborative customisation that involves customised production or engineering and perceived customisation of product and service. These might be enacted by various groups of actors, which eventually will be consequential for the strategy in practice. The enactment might, due to the understandings about how the supply chain operates, result in stability instead of change (Feldman 2003).

Performative definition

With the assumption that a performative definition needs to involve both dynamics and complexity to account for variability and for stabilising performance, I have resonated with principles-of-COP literature and with practices-of-COP literature. In the course of the chapter development the induced performative definition is:

> COP is an interplay between variability and stability. The interplay develops in the use of COP by error or by intent and reinforces or transforms the use. COP is likely to be changed because dynamics in the

> moment gives new meaning (from, e.g., the technical, social or political context) at the same time as physical properties of COP define the use. COP is one structure among others that actors involved need to enact. This means that actors enact development in, for example, the structure of outsourcing, and then its logics and dynamics will interfere with those of COP. There is a recursive relationship between understandings and performances.

The definition enforces the argumentation of the strategy-as-practice field that strategic development might be more or less connected with top management decisions. Instead it is an enactment process of COP-in-practice, in line with other technologies-in-practice (Orlikowski 2000; Regnér 2008). A development might be planned or more emergent and imply change or stability of activities (Adler et al. 1999; Feldman 2003; Feldman and Pentland 2003).

An example of this kind of strategic development is illustrated by Regnér (2003), who describes fundamentally different strategy activities in the organisational periphery and centre. Regnér (2003) describes that strategy making in the periphery is inductive and is oriented towards the business network and others. The role of the supply chain for this type of strategy making becomes acknowledged. Earlier strategic management research that includes other actors talks about the role of middle managers, consultants and board of directors, i.e., actors that are on an organisation's pay-roll (Floyd and Lane 2000; Jarzabkowski et al. 2007; Samra-Fredericks 2003).

COP-in-practice

Building on earlier work on structuration (Giddens 1984; Orlikowski 2000), I argue that the kind of system in which the COP structure works enacted by users (strategic actors) is the industrial system (Figure 3.3). The structure of activities, resources and actors involves dynamics that are based on, for example, the network of relationships between actors or the production system of resources and activities that involve actors with multiple objectives. See, for example, in Figure 3.7 that the industrial system is one among several structures that is influential as a principle and as a property of COP.

If Figure 3.7 depicts the action, then seeing practice and its effects through a texture of connections in action is seeing practices in terms of consequences. The social effect of COP in relation to COP-in-practice is seen as "the effect of a weaving-together of interconnections in action" (Gherardi 2009:118). The analysis is by reflexivity of practices and the reproduction of society, in line with the source of Orlikowski's (2000) inspiration, Giddens (1984). It focuses less on the performing actors and more on the performed actions regarding agency, interpreted as effects.

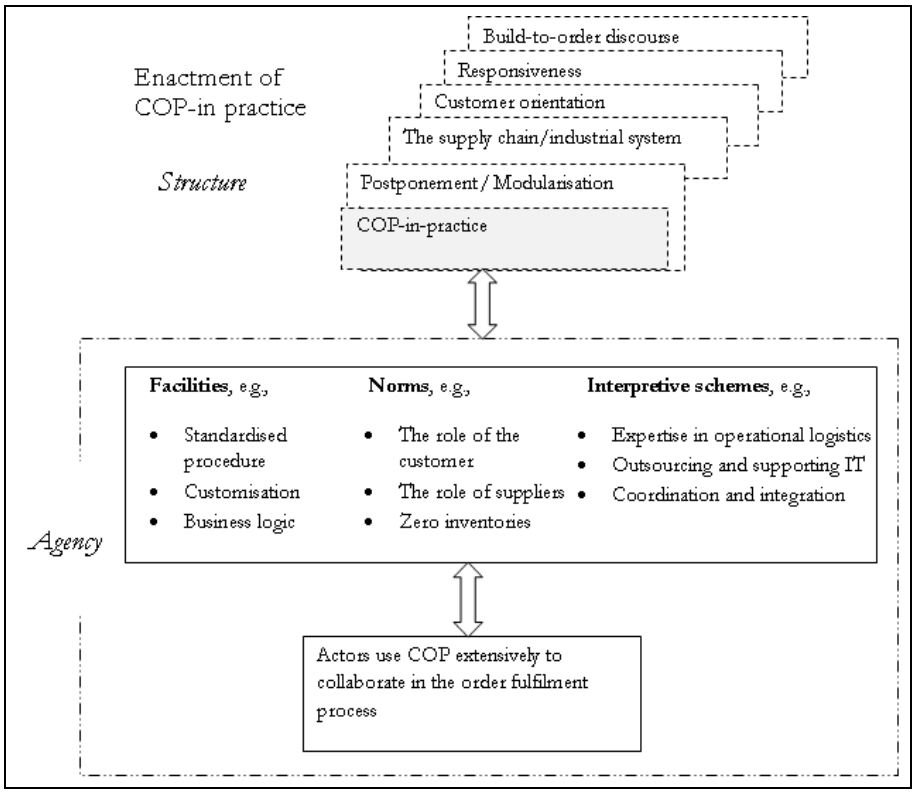


Figure 3.7 COP-in-practice enacted by strategists in the supply chain.

Strategising patterns is an example of this kind of weaving together of interconnections in action. Jarzabkowski (2005) studies strategising over time. Situational patterns in the strategic development are conceptualised by drawing on different types of legitimacy in the action (Jarzabkowski 2005; 2008). The patterns are of two basic types of strategising, procedural and interactive strategising. Procedural strategising is based on structural legitimacy and on an embedding structure of administrative practices. Interactive strategising is framing meaning based on interpretative legitimacy in the interaction. More specifically, strategising is fluid and based on different degrees of legitimacy and ensues from action and structure. In Jarzabkowski's (2005) university study, different types of strategising are seen to result in different activity systems dynamics. One type, pre-active strategising, is actually difficult to trace as activities are localised. It involves low structural and interpretative legitimacy and results in weak dynamics for any happening. A second type, procedural strategising, involves high structural but low interpretative legitimacy, while a third type, interactive strategising, involves low structural but high interpretative legitimacy. Procedural and interactive strategising are polar types that either strengthen development by embedding structures or alter it through human

agency. The final type, integrative strategising, has high structural as well as high interpretative legitimacy, which stabilises development into an incremental change over time (Jarzabkowski 2005). Thus, specific patterns of strategising can be perceived.

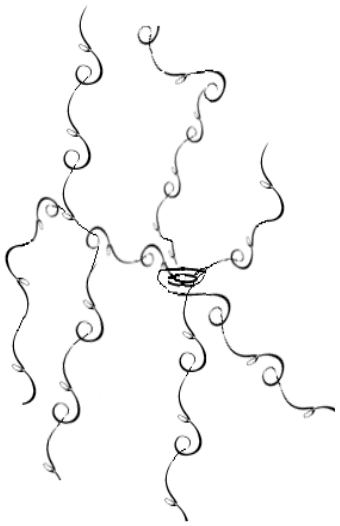
Ostensive definition of COP	**Performative definition of COP**
Customer orientation Operational logistics Standardisation/customisation Outsourcing of activities IT support Integration Responsiveness Inventory Modularisation Mutability Postponement Option bundling Routines in order fulfilment process for customised products (exchange and adaptation)	

Figure 3.8 A proposed weaving-together study of COP performance.

A weaving-together study of COP effects of practices and material arrangements bundles is illustrated in Figure 3.8. COP performance reinforces, transforms, overlaps and connects different streams of actions (Orlikowski 2000; Schatzki 2005). A performative development (in line with the by-effects approach, Figure 3.8) is guided by and guides different ostensive properties of COP differently over time. The development might be reinforced rather than changed, or transformed into changed structures that are enacted. Aspects are enacted by situated innovations in response to unexpected opportunities or challenges (Orlikowski 2000), which might reinforce, ignore, enhance, undermine, change, work around or replace their existing situated and emergent practice (Orlikowski 2000:423ff). A development seen as a practice-material arrangement might overlap when actions are part of other scenarios and connect in chains. For example, actions from different practices are performed in the same place in the material arrangement, and actions from one practice forms beliefs of participants in other practices. In this way, a COP strategy in a supply chain is a messy myriad of practice-material bundles (Law 2004). When it comes to a practice-material bundle of people, resources, machines, etc., Law (2004:1) argues "If this is an awful mess. . . then would something less messy

make a mess of describing it?" The proposed weaving-together study aims to understand origin and development rather than workings and aims to make a sensible meaning of performative COP.

I would now like to revisit the part of the purpose of this thesis, which was to explore and analyse how strategic development related to customer ordered production can be understood and conceptualised. Based on the theoretical framework and the suggested performative definition of COP (involving agency and structure), a logical manner to understand and conceptualise strategic development is achieved by exploring and analysing the literature and taking in practice. Integration practice and COP practice are connected in action. A practice-arrangement bundle (Schatzki 2005:476), denotes a supply chain as a product of actions performed in practices (no difference regarding intent to only perform a logistics practice or to make a change). The bundle is a mesh that embraces existing and sometimes altered practices and material arrangements that will purposefully illustrate the COP strategy as a bundle of practices and material arrangements. Practices performing in industrial systems (Johanson and Mattsson 1992 interact with the practices and material arrangements of other entities. By that, the frame of reference offers a plausible conceptualisation and an explanation of the relationship between practices and strategic development.

Chapter 4 - Methodology

Business life is in my view complex and full of paradoxical tensions. Is there any "true reality" to find behind the different scenarios in business life? Not in my view – I see social reality as something that is created dynamically as a part of participants' consciousness. This reality is socially negotiated among the participants. I am puzzled by ambiguities, dynamics and complexity and therefore a qualitative approach is an easy choice to learn more about that aspect of business. Now, this is possible by different methods, and in this chapter I will reflect on my abductive research process and on its outcome. Both reflection during the research process and reflexion after the research process need to be illustrated, in order to show the trustworthiness of the interpretation and the relational foundation (cf. Alvesson and Sköldberg 2008; Dutton and Dukerich 2006). The chapter intends to give transparency to my research procedures, which permits the reader to assess the value of the study (in line with Dubois and Gibbert 2010). Such transparency refers to reducing the level of complexity and walk the reader through the decisions taken in the development of theory, method and empirical phenomena.

Reflections on doing research

Doing research is a process rather than a project. I would like to characterise my research process as a constructed intrigue founded in relations with research companions. The construction is informed by empirical matters and by theory, and the relational founding is the source, means and ends of the research.

Reflexive construction

A reflexive contribution to established theory is possible through a systematic search for deviations from what would be expected in empirical contexts and through the use of that as an inspiration in critical dialogues between theoretical frameworks and further empirical work (Alvesson and Kärreman 2007). The direction of the dialogue might be changed because of changes in the empirical case, the theoretical direction and methods applied. The outcome of the dialogue, that is, research results, differs along the research process in the meaning that each turning point in the dialogue is important and matters because there is a reason to involve, for example, a new theory in the dialogue. The trustworthiness of the research is in the plausibility of the research process and in the "beauty" of the theoretical development. Beauty is perceived differently according to different stakeholders' criteria. Therefore the relational foundation of the research is decisive for the process and the research outcome.

The first phase of the empirical study

In August 2003 we, as researchers of logistics and SCM, were invited to Odette Sweden AB in Stockholm, which is a cooperative association for the automotive industry. We were asked to and decided to take part as academic partners in a Swedish SCM project. The project concerned IT integration of supply chains and was developed as an industry-wide management concept labelled supply chain monitoring (SCMo). In addition to ourselves, those taking part in the meeting were one representative from Volvo Car Corporation working with strategic logistics issues, the CEO of the automotive suppliers association FKG, Fordonskomponentgruppen, and the CEO of the OEM[1]-owned organisation Odette. Participants from nine OEMs, four automotive suppliers and interest organisations for the automotive industry jointly wrote the recommendations for SCMo in 2001 (Odette 2003). SCMo was an industry-wide initiative that has been implemented in competing supply chains, of which we studied two less successful pilot projects in order to learn about these before a Swedish project was initiated. The projects studied lasted for approximately six months and were terminated in 2004.

Basically, the projects were studied in retrospect through telephone interviews with European key actors and through analysing the written SCMo recommendations. The telephone interviews were conducted by us, the academics, but often the representative from Volvo Cars participated. In all interviews he provided access as a former participant in the development group of the SCMo recommendations. The informants' role in the SCMo project was as initiators or as project leaders in the firms of the supply chains (OEMs, suppliers, IT system suppliers). The information from the interviews was not perceived as secret, because SCMo was developed as an industry initiative, but the informants wanted nonetheless to remain anonymous. De facto, studies of failures are sensitive information to individuals as well as to firms and also an important input to research.

A Swedish project was prepared and system suppliers were chosen. The Swedish project group was supplemented with one participant from Volvo Trucks. JIBS participants, besides myself, were Susanne Hertz and Jens Hultman. Our role was to give academic input to concept development and project implementation, and to map the order fulfilment process in a few chains, with at least three firms in each. The role of Volvo Car Corporation was to be the driving force for a trial implementation, within the own organisation, in relation to suppliers and IT system suppliers. The role of Volvo Trucks was to follow the project, give input and learn. Odette's role was to coordinate and manage the project. Close to the ending of the project, another participant came into the project group without being really interested in SCMo. In the SCMo concept, the build-to-order strategy is a given and a goal of how to fulfil orders. Interestingly, the new participant was interested in another

[1] Automotive original equipment manufacturers.

(complementary) IT solution for tracking and tracing the material flow. It was an advocate at Volvo Cars for an RFID (radio frequency identification) project, who tried to mobilise forces for RFID implementation in this project. The two ideas were seen as possible to combine in some aspect, in order to make things happen in a way that Lindblom (1959) denotes as "the science of muddling through". The two projects were both seen as important; they got internal support but lacked resources. The struggle for financing was not solved and the project ended. (As an epilogue it could be mentioned that SCMo as well as RFID was eventually tested in another setting, however only with internal Volvo Cars actors and with a different objective.)

The SCMo setup was meaningful to my study because of the common learning and the access it provided to the issue. I saw this unique opportunity to study a case of increased supply chain integration as essential to learn from and learn with in a process study. Process studies are, in brief, used to understand how a sequence of events changes over time (Langley 1999; Pettigrew 1992). A process study with its assumptions[2] matched the needs and possibilities of studying SCMo, a change project that I defined as a case of supply chain integration. However, the SCMo project ended and I had to reevaluate my study. For a fact, the project ended before it affected supply chain integration. It would be possible to use the material and do a more static case study of it, searching for themes and variables that made sense. But then, my presumptions of the importance of dynamics could not be investigated. What was this about (more than an ended project)? The project offered a well-accepted conceptual solution to a well-known problem and it was prioritised by the management as an issue of strategic importance. What was the problem? That is, beyond the lack of resources; or was it just the lack of resources that was the problem? In a few attempts to interpret the development I co-authored a chapter about the characteristics of SCMo, such as power and transparency, wrote an article about power in supply chain development issues and also authored a conference paper about objectives, the meaning of efficiency and effectiveness in supply chains (Borgström 2005; Borgström and Hertz 2007a; 2007b). However, as far

[2] Pettigrew (1997) points to five assumptions in process research. The first is to acknowledge that a process is embedded in context and therefore demands several levels of analysis. He claims that the inner and outer contexts embed processes, and asymmetries between levels of context are a source of change. The decision to bring in or leave out certain aspects and levels is researcher-led. The second assumption is that a process is interconnected by its past, present and future and the sequence and flow of events is, in a process study, a key to understanding patterns and the underlying logic of the process. Third, context and action form a duality in holistic explanations, i.e., they could hardly be separated as context-free variables with causal power to explain a process. Fourth, links between context and time require holistic rather than linear explanations; in other words, conditions link process and context to a certain outcome. The last assumption, the fifth, is that a process analysis interrelates to the process outcome in order to find causes of an effect. Pettigrew argues that a comparative study of several change processes is beneficial in order to understand and explain the type of process. Pettigrew, Andrew M. (1997), "What is a processual analysis?," Scandinavian Journal of Management, 13 (4), 337-48.

as I could understand from the empirical study, it was not a question of less integration or about inertia, because the coordination continued in other ways. How would this influence my research? One option was to end the process and go deeper into the context and understand it (potentially by comparing this implementation to other implementations). However, that was not so interesting because similar studies exist. The newness and contribution from the process study was in the participative method and its inherent possibilities to understand integrative processes.

Instead I decided to pick up some interesting empirical deviations from what would be expected and develop my theoretical understanding. My choice of method needed alignment with the phenomenon instead of sticking to analytic labels and pre-formulated research strategies (Czarniawska 2008; Van Maanen 1979a). The SCMo project was about better matching demand and supply and aimed to increase integration of the supply network in that ambition, but the distribution network was not involved. This meant that when matching demand and supply, the important demand side was not included and the project participants knew very little about the distribution network.

A recent dissertation, a comparative case study (Hallström 2005), concerns the car distribution organisation seen as characterised by overcapacity, intense competition and manufacturers heavily focusing on brands. The study argues that, among other forces in the distribution setting, industry overcapacity appears to undermine efforts to create constructive relationships between channel members. Order-to-delivery systems and systems to feed back market knowledge are superseded by the pressure to sell pre-produced cars. Particularly volume brands suffer from fierce competition, while a premium brand provides some protection from competitive forces. Actually, Hallström suggests that the pull philosophy, which is a cornerstone of the predominant strategies in the automotive industry (lean and build-to-order strategies), should be rejected. The main reasons are partly customer-based, such as "immediate delivery drives volume", partly dealer-based, such as "letting dealers develop competition against other dealers of the same brand", partly manufacturer-based, such as "taking advantage of scale economies", and partly based on the existing volume convention that the wisdom and way of thinking of manufacturers, importers and dealers to a great extent emphasise volume, including reward systems. In addition, Hallström argues that all in the distribution chain are likely to benefit from higher volumes since more cars means more profitable after-sales services, including more spare parts. Here the logic falters in the assumption that the distribution network should act in a transaction-based logic and still be able to share the benefits of after-sales incomes, that is, act in line with relationship-based logic. Hallström's thesis is contrary in its conclusions to that of Holweg, which is more comprehensive in that it is based on car distribution *and* the supply network; Holweg investigated the inhibitors of responsive order fulfilment in new vehicle supply systems (Holweg 2002; 2003; Holweg and Pil 2004). Thus, here was an unresolved theoretical issue. I decided to change my

approach at this point. My empirical material involved a unique case (in the automotive industry) of customised production and I had access to empirical material regarding the initiation of the development. In addition, I could see an opportunity in applying a practice lens on the development in order to gain deeper understanding of the content and process of the development. After this turnaround I might see the SCMo project as an attempt to stabilise certain working procedures in the bigger picture of development instead of as a change process of integration. Thus, in the research process I changed my assumptions of what was happening.

The last phase of the empirical study

Unexpectedly, two students who studied another project at Volvo Cars argued that despite the customer ordered production, that is, that all cars are produced for a specific customer, a dealer they interviewed was troubled by all cars that they owned and had not yet sold.

What was happening? My supervisor and colleague in this phase, Professor Susanne Hertz, had studied the implementation of the build-to-order strategy and learned that no car was produced unless it was customer ordered and we had learned that this strategy was alive through the SCMo project. This was strange. Based on theory, we would have expected to find a production-oriented logic in the part of the supply chain that produces cars and a customer-oriented logic at the dealers'. But here we learned that the supply chain acted in line with the build-to-order logic and the dealers were plagued by cars in stock because of a forecast-based logic. The development contradicted our assumptions.

Was this related to the SCMo project? It would be easy to say that this is something quite different because it is related to another process, but it is still connected to the functioning of the order fulfilment procedures. Pettigrew described a process as a river of several streams flowing into one another in a terrain, constraining and enabling each other (Pettigrew 1997). In such circumstances the practice lens is an appropriate methodology in order to analyse either how parallel streams of action might reinforce or transform the development or how these enforce stability.

As stated before, I regard the context and the process to be intertwined and cannot be studied as a process *in a context* because it is a development process that includes the context. My experience, based on interactions with people and different functions in the supply chain, is that the strategy seemingly had changed dramatically in meaning. This might not be strange because different actors are situated in different contexts and act on the basis of different rationales. The situation is changing all the time, and to my knowledge the practice approach is a better approach in order to understand what is

happening with the idea and strategy of customer ordered production[3]. A practice approach attempts to follow the action and create meaning of the performance. My change in approach evolved in line with the change of my empirical study in order to explain the happening or non-happening of a specific idea rather than of an organisation.

Some consequences of my choice to follow what was intriguing relate to the case. Both Holweg (2002) and Hallström (2005) used a mapping technique in order to learn about car distribution, which includes an empirical material that provides wide and deep knowledge about a state of affairs. This type of material often results in a number of later studies using the same material in their analysis. Since I decided to follow a specific development by learning from purposeful questions to the empirical field and literature, the reutilisation is limited. My wide and deep knowledge relates to a development rather than an organisation or a distribution system.

Seeing practice and its effects by a texture of interconnections in action

The relational founding from the earlier part of the study provided another type of access and avenue of learning. To me, doing research is learning about what is going on and to construct a mystery and then solve it meaningfully because I want to interpret the meaning of the research object (Alvesson and Kärreman 2007; Asplund 1970). Therefore the empirical study evolved, but now I had to arrange the access from outside. I referred to the earlier cooperation when arranging new interviews and to the sake of their strategy. Those that I contacted were genuinely interested but we did not know each other as we did in the SCMo working group. And, the learning was related to the development of customer ordered production. How would that affect my study?

Well, in a constructivist/interpretivist study, which relies on an intersubjective ontology, the interpretation arises from interactions and reflections in order to see constructions and learn what is going on (Hatch and Yanow 2008). Much interpretative research draws on Clifford Geertz's concept of thick descriptions (Geertz 1973). How thick is a thick description? Geertz

[3] Taking a second look at the assumptions of process studies discussed by Pettigrew (1997), I would like to point to some differences in how processes or, better expressed, actions unfold. First, as a process evolves, there is no such thing as levels of analysis or of context; the happening involves certain aspects such as decision makers, authorities and resources, and these are involved to the extent that they take part in the development and re-direct its path. There is a structure of action that is dynamic and complex. Second, the interconnectedness of past, present and future gets its meaning by those involved in the action, who create the meaning along the process. Third, context and action are inseparable rather than a duality. Fourth, Pettigrew seems to argue that context and time are needed for an understanding of the mechanisms and logic of a process (seeing the process as an object), while I instead argue that these are important in order to understand the social apects of the process, i.e., the mechanisms and logic are inherent in the social aspects and their practices instead of in sequences of the process. Fifth, the outcome is inseparable from the performance.

argues that we need to see beyond the "face value" of what we study. A common misunderstanding is that researchers have to live in the studied cultures in order to understand them. Another misunderstanding suggests that more empirical information results in better descriptions. In some of the recently published dissertations in Sweden this is evident; the field study tends to be extended and involves hundreds of hour-long interviews and videotaping in addition to participation in meetings. This material is then used to interpret common themes. Such field studies are purposeful especially in studies that rely on an objective ontology, in which methodology helps to fully represent the observed objects (Hatch and Yanow 2008). These studies are in contrast to constructivist/interpretivist studies that are grounded in intersubjective ontology. The interpretation in this case arises from interactions and reflections in order to see constructions and learn what is going on (Hatch and Yanow 2008).

Actually, explorative interpretative theory development relies on insights. The conventional wisdom in qualitative case study research that the findings of the case depend on the identification of common themes across the interview statements of multiple informants has been challenged by the argument that the number of cases or the number of interviews loses in importance if the aim is to get new insights (Llewellyn and Northcott 2007). Following the same line, Alvesson (2003) criticises the dominating neo-positivist and romantic views on interviews and argues that interviews might be used to explore issues. The interview is a site for new insights. Thus, the interview is a shared experience and a site for further empirical and theoretical exploration rather than a window to see a "reality". The empirical material is seen as inspiration that results in learning based on knowledge, which is of importance in order to gain new insights into a productive inquiry (Cook and Brown 1999).

My productive inquiry has emerged–from studying a process of changed supply chain integration in which individuals' action was important to studying development of an idea, the build-to-order strategy where the happening was in focus. COP is the case and the unit of analysis. The decision to change focus was connected to the closing of the SCMo project and the peculiar indications of what the order fulfilment process had developed into. The research logic involved systematic combining (Dubois and Gadde 2002) and was abductive (Alvesson and Sköldberg 2008). The history is constructed to make a point (Van Maanen 1995), and also the interpretative analysis involving use of theory and further empirical fieldwork is constructed in order to increase knowledge of the development of customer ordered production (Alvesson and Kärreman 2007). Such constructive theorising is pragmatic for increased sensemaking (Alvesson and Kärreman 2007; Czarniawska 2008). Thus, in this continuation I searched for meaning of the development in different empirical sources.

The empirical material I used, besides my own participation in interviews and meetings, consists of written sources (see Appendix 1). One source was Mediearkivet, which is a digital full-text database of newspapers that includes

material from more than 300 Swedish printed newspapers, magazines and business press, dating back to 1987. Volvo Cars is a business of great importance in Sweden which has attracted and still attracts interest from media. Media discuss what is happening when it is happening with a specific perspective such as critical examination, pitching good news or just reporting on the latest development. I used search criteria such as Volvo Cars and customer ordered production in Swedish. Another source is my supervisor's material from the study of the first phase of the development. In addition, an important source is other research reports; Volvo Cars has attracted a huge interest from academia, and some dissertations have been valuable to my inquiry.

Also, I searched for meaning by writing papers (two co-authored with Susanne Hertz about strategic development in supply chains and about strategic content issues in logistics and SCM research and one as a sole author about methodology) in order to refine the problem, the empirical material and my interpretative theoretical repertoire in line with Weick's argument that interpretative activities are to make sense: "How can I know what I think until I see what I say?" (Weick 1995a). Thus, my writing is preceded by a way of seeing and a way of thinking that is based in knowing, and this interpretative process is based in my identity as a researcher that is made up by interactions in relationships. Consequently, the theorising relates to interactions in relationships. Therefore, the relational foundation affects trustworthiness and applicability of the research outcome but also acts as an energiser. Huff (2009) emphasises that as scholars we are involved in a conversation by interacting with other scholars, and as a good conversation stimulates development, we need to choose the conversation in order to increase knowledge and be published, i.e., be listened to in public. Actually, the relational foundation is argued to be an underappreciated dimension of interesting research because it acts as a feeder and enabler of the overall quality of a research project (Dutton and Dukerich 2006). Interaction partners within the foundation can include co-members of a research team, people whom one is studying and individuals who are neither researchers nor participants, but who, through their direct or indirect contributions to the research, affect research quality (Dutton and Dukerich 2006:21). Next, I will elaborate a little on the relational challenges pertaining to access, learning and collaboration that have contributed to the quality of my research project.

Relational foundation

Theoretical literature is ideas, argumentations and a huge amount of investments (careers, financing, emotions, etc.) and acts as a conversation partner that sometimes engages and at other times leaves me cold. The literature is the official conversation that is able to invite new conversation partners and acts as an open invitation. I have sought conversation partners

partly by subject search and partly by getting to know my conversation partners' partners, i.e., looking into their references. The continuous writing of papers gives me access to blind review comments and an indication of whether my contribution to the conversation makes sense.

Authors gather to converse at conferences, which offer opportunities to learn more about both the conversation partners and new ideas. I have taken part and I like to take part in the NOFOMA conference, the CEMS workshop, the IMP conference and others. I have engaged in logistics, SCM and industrial purchasing and marketing discussions. Hitherto, I have participated in one conference with reference to the strategy-as-practice field, which also inspired me, especially since two colleagues and I created writing workshops where we energised each other in the discussions and targeted this conference each with one presentation. More conversations through conferences are difficult to manage because each one demands a great amount of resources, such as time and funding of conference and travel costs.

To me as a doctoral candidate, the doctoral courses, especially in the later phase of the research process, have been invaluable – access to appropriate literature, common learning through informed discussions about a subject and getting to know others interested in the area. These courses have added to my interpretative repertoire, which is necessary in order to ask interesting questions and conduct the continued study.

The relational foundation with Susanne Hertz has been precious in the study of Volvo Cars and in theoretical discussions. We have shared a genuine interest in the empirical part as well as in much of the theory, which gives a possibility for me to learn as in an apprenticeship with friendly but constructive criticism along the way, which might be more important to the overall quality than the more outcome-related blind review comments. Co-working gives access to insightful comments on ethical issues, quality issues and the decisions that direct the research process as it proceeds. Besides the learning aspect, I accessed the early part of the empirical study in this relationship, via documents from that period, transcriptions, discussions and joint participation in a teaching case, which made sense in the interpretation of that material as well as in what questions to ask next. In the early phase of the study Jens Hultman and I shared the work of transcribing interviews, and together with Susanne Hertz we acted as a research team participating in the SCMo project, discussing the empirical material and its inherent surprises. However, also the SCMo project group participated in some of these discussions and took advantage of our material, which contributed to the overall quality in that phase as it was meaningful and created productive questions. Refining questions and making sense of material is a part of the productive inquiry (Cook and Brown 1999). The people whom I was studying offered as much access as I asked for despite their pressured schedules.

Thus, in the reflections on doing research by reflexive construction I would like to underline Dutton and Dukerich's (2006) claim that the relational

foundation is an underappreciated element in research. Being in a sphere of common interest in order to learn about the research object, doing high-quality research and having an intent to learn together is the most valuable foundation in order to enjoy the research process and to do interesting research.

Reflections on writing research

Writing up research is often a retrospective action in order to make sense of the research results to others. The material I write up is an informed choice based in an interpretative repertoire developed through unofficial papers, such as doctoral course papers and through peer-reviewed papers (different parts of the academic conversation). As my study changed in its characteristics when I was doing the research, the papers and my interpretative repertoire developed in order to make sense of what was happening. The published papers along my study involve supply chain integration (Borgström and Hertz 2003; Borgström, Hertz and Nyberg 2008b), conceptual development of supply chain objectives (Borgström 2005; 2009a), inherent challenges of increased supply chain integration (Borgström, Hertz and Hultman 2005a; 2005b), implications of SCMo (Borgström and Hertz 2007a), the role of power in supply chain integration (Borgström and Hertz 2006a; 2006b; 2007b), logistics consequences of strategic choices (Borgström, Cui and Hertz 2008; Borgström, Hertz and Nyberg 2007; 2008a), meaning of customer ordered production in practice (Borgström and Hertz 2008a), opening up a new theoretical perspective of customer ordered production (Borgström and Hertz 2008b; 2009) and opening up a methodological perspective (Borgström 2009b; 2009c). The objective of this endeavour is to make the research interesting.

What makes research interesting? And, why does it matter? Bartunek, Rynes and Ireland (2006) discussed these issues in the Academy of Management Journal Editors' Forum as a response to a survey of the journal's editorial board members. The survey indicated a need for interesting research that both has more influence and might produce a higher degree of learning because of its positive effect and the fact that it is read, understood and remembered. Intriguing issues have impact but that is not enough; to be interesting, issues must also be investigated in a competent and defensible manner. In qualitative research, new insights and thorough understanding are keystones in order to explain why and how the empirical phenomena develop in a certain way. Van Maanen (1979b) characterises qualitative methods as an umbrella term covering an array of interpretative techniques which seek to come to terms with the meaning of particular and ambiguous phenomena in the social world. A piece of qualitative research is to be seen as a map of a territory and, as such, the map might be better or worse for reasons such as its descriptive value, importance to target group and novelty of the findings uncovered. The map must be able to communicate an understanding and persuade the reader.

Thus, the writing is a performance with a persuasive aim because the theories are aimed to do practical work rather than mirror reality, the theories help generate reality for readers (Van Maanen 1995:135). The empirical part of this thesis should be read as a narrative based on my sensemaking of interactions with people involved in the development and with literature. The empirical part was written in order to illustrate the parallel streams of happening that enforce and contradict each other and the specifics of the order fulfilment practice that is influential in the strategic development. The description is a step in the theorising that I will come back to. The theoretical framework is another stepping stone. It was written up in three major parts starting with an introduction to my practice perspective because I have argued that, in practice, we have not yet made sense of strategising in supply chains. We know little about the complexity and dynamics involved in the development. The framework continues by bringing together the principles of my subject of what is known in relation to customer ordered production, especially the concepts and the accounted-for dynamics and complexity. And finally I bring together what customer ordered production development would mean in a practice perspective by putting forward a framework suitable to bring knowledge, now including dynamics and complexity of practice that increase the understanding of strategic development in supply chains. Thus, in order to understand what is happening in the development, I draw on variables from ostensive research results – what might affect dynamics and complexity, and what comes into play in the happening that I will theorise on in a performative manner.

Theory in this perspective is seen by Colville, Waterman and Weick (1999) not only as a map in line with Van Maanen (1979b), but also as past, present and future: as a resource of retrospective sensemaking, as present interaction and translation between theory and practice in a conversation and as future sensemaking of ideas with explanatory possibilities rather than explanatory predictions. Thus, theorising includes sensemaking of the past, the present and the future. My interpretation is ongoing and situational, and future interpretations will have another past, present and future hopefully involving some reflections based on this research. How can the findings be generalised and interesting to practitioners? Colville et al. (1999) argue that sensemaking of academic writing to practitioners is achieved by (1) using a broker or an editor who is able to point out the meaning by cues, feelings and experiences or by (2) keeping ambiguity and inviting readers to project their experiences and learn from that. The alive and unfinished theory that resonates with the reader is exemplary – good theory is a pretext for conversation; it stimulates activity and adaptive processes. Good conversations are social processes for bringing people and ideas together and creating something that was not there before – theorising (Colville et al. 1999:143), based in an intersubjective ontology (Hatch and Yanow 2008). Interpretation arises from interactions and reflexions in order to see constructions and learn what is going on.

Czarniawska (2008) argues (in line with Balogun, Huff and Johnson 2003) that traditional ethnographies do not offer the best approach to studying contemporary organisations, where organising happens simultaneously in many places. Strategic development in a supply chain happens in several organisations and in several of these organisations over time; the boundaries are fluid. The territory of an organisation, a group or a supply chain is questionable to use in a map when the phenomenon is fluid. Thus, it is difficult to get close to the happening because while the traditional ethnographer is at one site, the managers being studied might not be (Czarniawska 2008:6). Instead, Czarniawska proposes different ways to get close to actors, such as shadowing key actors, in order to capture the phenomenon despite its mobile, dispersed, heterogeneous and computer-mediated character. Shadowing actors could as well be following objects, in order to describe development of the situated object. How is this best illustrated? Czarniawska calls for novel ways of presenting the material, such as photo reportages, which seem to target an aesthetic understanding via other media than text. However, also text might be used in novel ways of writing up ethnographies in order to reach different readers, such as dramatising them or creating heroic stories of nitty-gritty happenings. Or, as Czarniawska draws on Latour's (1996) text and symmetry principle in order to show a good example of a text, this illustrates different possible "worlds" in conflict that move and shape one another. And more importantly, the "worlds" need to be free from judgement until the end. She argues that questions about a text, such as whether it is reliable, valid or at all science, should be replaced by questions such as: Is it interesting? Is it relevant? Is it beautiful? The text should be read and create interest for further conversation (Czarniawska 2004a:136). All descriptions involve interpretations, no matter if photographs, dramas or sticking-close-to-the-field quotes are used (Czarniawska 2008:16).

In my empirical part, the parallel streams of happening in the order fulfilment practice and the strategic development serve as the plot. It should be clear that I want to make a point of the text, which is informed by interactions with the empirical field and with the literature (Alvesson 2003; Alvesson and Kärreman 2007; Czarniawska 2004b). It is thought of as a history that leads to a point based on an intrigue that is arranged of actual occasions and activities (Czarniawska 1997). Often a timeline is used to situate a scenario, but time gives a poor structure to my story. For example, Ericson (2008) uses a musical metaphor, the fugue, to describe the structure. She uses the fugue in order to capture a flow of strategic activities and to represent dynamism, constituted in themes that are repeated, expanded and varied. I use the parallel streams of happening in order to represent strategic development instead of using time. The empirical Chapters six and seven illustrate the ostensive and performative "worlds" that move and shape one another after an initial contextual description of Volvo Cars in Chapter five. At the end of Chapter six the COP development is substantiated in an empirical analysis of how parallel processes

affected development involving COP. Likewise, in Chapter seven the performative effects are substantiated as effects in between change and stability.

The empirical interpretations are further developed in the analytical chapters. First, in the analysis I investigate/ ostensive definitions of COP in relation to the empirical analysis of how parallel processes affected development involving COP. Second, I analyse the performative COP in its interaction with different actors. These two analytical chapters were planned and followed from the theoretical framework. In the writing process I understood that I needed an additional analytical chapter about consequences. In Giddens's (especially 1979) discussion, consequences were important to elaborate on because these infer meaning. The literature that draws on Giddens (see, e.g., Orlikowski 2000) seldom pays enough attention to outcomes and contradictions of consequences. The third analytical chapter therefore elaborates on consequences of confrontations of ostensive and performative explanations in order to understand COP development. Finally, the fourth analytical chapter is made to create meaning of the analysis in terms of conceptualisation of interorganisational strategising. The intent in the empirical and the analytical parts of the thesis is basically related to the purpose and additionally related to showing ambiguity on which readers can project their experiences and from which they can learn (Colville et al. 1999). The research writing is based on and further develops insights from the research doing. Often a theoretical analysis is based on different ways to refine existing ostensive concepts. The practice lens opens up to understand meaning from what is happening from at least three views (Gherardi 2009; see description of views in the practice lens section in Chapter Frame of reference). My choice to see practice and its effects through a texture of connections in action is practices in terms of consequences, which was based on the empirical material, the interest in supply chain integration and its effects, and the engagement in Orlikowski's (2000) treatment of Giddens's (1979; 1984) theory of structuration. In this way methodology is an important part of theory that is used in the analysis. The two complementary ways to study practice, as proposed by Gherardi (2009) relate to practices as an array of activities as seen from outside and practice as in knowing a situated activity from inside. The view to see practices in terms of consequences was upheld by an active productive inquiry (Cook and Brown 1999).

Reflexions on theory construction

Basically, I contribute to theoretical generalisation (Bryman 2002) and, to the extent that the outcomes work, to learning something more than the contribution in practice of existing constructions. Additionally, it is argued that reflexivity is a route to more thoughtful and interesting research (Alvesson, Hardy and Harley 2008). In this line of reasoning, reflexivity means a second

thought of what one is doing and, especially, the role that different moves and manoeuvres play in producing particular research accounts. It may also inspire creativity through opening up for new perspectives and providing reference points for what one is doing (Alvesson et al. 2008; Alvesson and Sköldberg 2000). However, without critical interrogation, reflexivity may be used as a cynical rhetorical device designed to demonstrate researcher credentials and it may primarily fulfil ceremonial purposes of legitimation (Alvesson et al. 2008).

My theory construction started in questions about integration and supply chain integration. Fabbe-Costes and Jahre (2007) argue that more rhetoric than reality seems to be the case in the claims in SCM literature that there is a positive relation between supply chain integration and performance. They argue that it is difficult to prove the claims made in SCM literature. And, it *is* important to critically question SCM premises and consequences (New and Westbrook 2004), but then SCM should be seen in its practice of coordinating and should not be evaluated by supply chain integration principles of SCM literature. Ostensive principles enable people's specific performances of SCM, and the performative aspect creates and modifies the ostensive aspect of SCM (cf. Feldman and Pentland 2003). In my line of thought, this means that SCM might very well be an applied concept that is practiced depending on different situations. It is fruitful to understand the meaning in what is ongoing, in order to develop theory. With that ambition I use the practice-based approach in order to increase learning of practice and so influence the ostensive definitions. In this sense, I use a destabilising reflexive practice, which I will describe in more detail, because not only socially constructed concepts but also my construction needs critical examination (Wenneberg 2000). In what way is this research worthwhile?

Besides a theoretical contribution to an intersection of supply chain strategising in the domains of strategising, the IMP and the SCM literature on the practice approach is a contribution. The situated study and critical examination follows a tradition in Swedish organisation and management research (Alvesson 1995; Brunsson 1981; Czarniawska 1993). In my research approach I have relied to a great extent on Alvesson and Kärreman (2000) and agree that theoretical development requires a freer stance and a somewhat weaker coupling with "pure" empirical facts than what inductive approaches require (cf. Glaser and Strauss 1967) and a stronger coupling with theories, approaches, etc. (Alvesson 1995:48). This does not mean that empirical studies are unimportant but that interpretation is a process of empirical material, the interpreter, the research design and the research project. Alvesson (see, e.g., 1995) defines interpretation by drawing on Asplund's (1970) questioning of meaning of a social phenomenon by interpreting and making sense of its basic character arguing that interpretation is the act of giving a phenomenon meaning or discovering (something of) its 'inherent' purpose of significance. Czarniawska (2008) seems to have a stronger faith in the inherent possibility of stories to make meaning and a worry that premature theorising might produce

bad theories. In my view, these are proponents of two complementary dimensions of sensemaking, i.e., they use different acts of interpretation. However, it seems as if both Alvesson and Kärreman's (2007) way of reasoning and Czarniawska's (2004a) way of reasoning can be expressed in the words of Lewin: "There is nothing more practical than a good theory" (Lewin 1945:129, quoted in Ghoshal 2005), based on their grounding in pragmatism and guiding principle of whether the results work.

Consequently, theorising represents a continuous elaboration that is ended more for pragmatic reasons, such as that the sensemaking at hand is sufficient and plausible (Weick 1995a), than for objective reasons, such as that "no additional search in literature or in empirical material would add knowledge". Reflexivity related to such pragmatic ending enhances the value of the contribution by exploring the process, the results and what it might construct in terms of effects. Reflexivity is in relation to others, and Alvesson et al. (2008) call for reflexivity embodied in the research process and in the critical writing in relation to the academic community. Their call for reflexivity harmonises with the Dutton and Dukerich call for a relational foundation (2006). Such foundation with research participants, journal reviewers, etc., is the key to developing and sustaining interesting research, and Dutton and Dukerich believe that researchers should pay more attention to effective relational practice. Alvesson et al. (2008) identify four sets of textual practices that constructivist researchers in the field of organisation and management theory have used in their attempts to be reflexive. The reflexive practices relate to theoretical reflexivity, the field worker's reflexivity, institutional reflexivity and reflexivity by deconstruction, and are labelled multi-perspective, multi-voicing, positioning and destabilising reflexivity (which I exemplified earlier and will describe here). These are four groups of reflexive research practices that my study might be evaluated on and I will briefly describe them in the following way:

- Multi-perspective practices: Instead of treating a perspective as a manifestation of principles, it is worthwhile to seek out anomalies among perspectives. There are limitations in using a single frame of reference in order to provide new insights; sometimes the accumulation of perspectives adds reflexivity to a study (I will discuss this issue in more depth in the following paragraphs).
- Multi-voicing practices: How can the researcher speak authentically of the experience of the Other? Well, we do and thereby our particular experiences and interests in the process and our choices matter to what should be presented as meaningful. Giving observant research accounts that are creative and show that researchers as well as research subjects are vulnerable and experiencing and work to co-produce knowledge is a way to make sense. Actually, the whole section

"Reflections on writing research" is devoted to this and I will not elaborate further on the issue.

- Positioning practices: Particular knowledge claims are accepted in the context of a particular research community and society, and if research is institutionalised, then we need to be reflexive about the institutionalised way of doing research. Thus, why do we draw on specific knowledge claims? And why do we expect that our contribution should be accepted? Positioning practices are to clarify these issues (I will return to these questions). Positioning is also a way of taking part in a conversation, to which I have devoted a discussion in "Reflections on doing research".
- Destabilising practices: gap-spotting and critical examination of research accounts and academic conversation are destabilising practices in that these practices target unreflexive research of others. Others have another relational and reflexive foundation, which gives them the possibility and responsibility to maintain the questioning conditions and consequences of the construction of a theory. These practices are intended to destabilise the epistemological assumptions of other forms of theorising. They problematise the conditions and consequences of a theory's rationality, truth and progress and expose a theory as a myth. These practices are often the starting point of a scientific paper and sometimes the reason of taking part in or trying to initiate a new academic conversation.

An inherent limitation that Alvesson et al. (2008) recognise in the multi-perspective practices for reflexivity is: If each paradigm, metaphor or theory is individually flawed then how would a mixing be able to make a difference? They draw on Schultz and Hatch (1996), who argue that it is important for a field with a multiplicity of perspectives to take on challenges of using these in concert. Schultz and Hatch say that researchers might see perspectives either as incommensurable because of the differences, as integrated (ignoring the differences) or as crossed (engaging in the differences). My choice was to cross perspectives and engage in differences in two different ways; in a sequential manner and through second-order concepts.

First, in the "Principles of customer ordered production" I use the sequential strategy, where one perspective informs another (Schultz and Hatch 1996). The ostensive principles are developed foremost in the operations management field and are useful as a basis to explore practice. The principles rely on empirical findings but are based in an ontology different from mine. However, my contributions might still be illustrative to the operations management field in case complexity and dynamics are sought after rather than being assumed to be non-existent. Second, in the theoretical section "The practice of strategy development" I emphasise similarities that exist between the logistics/SCM field, the strategy field and the IMP field. I use practices to

act as bridges between the perspectives, and this is the crossing tactic of using practice as a second-order concept (Schultz and Hatch 1996). Practices take a position that necessarily blurs paradigm differences in order to construct bridges linking the perspectives (Gioia and Pitre 1990). A paradigmatic synthesis is not possible because of the basic incompatibility, not of paradigmatic assumptions in my case but of paradigmatic vocabularies and goals. Still – the multi-paradigm approaches to theory building can generate more complete knowledge than can any single-paradigmatic perspective (Gioia and Pitre 1990), both because they offer the potential contribution of theory when applied to theory building within any given paradigm, and because they also offer a contribution to theory since they foster an awareness of multiple approaches to theory-building and of constructing alternative theories.

The reflexivity inherent in applying multiple perspectives is questioned by Alvesson et al. (2008) on the premise that the choice of perspectives is with reference to the academic community, not the perspectives themselves, and relies on academic norms or fashions which are inevitably politicised, socialised and institutionalised. If my interest in practice studies is awakened by the ongoing fashion in social sciences, it is not because I have a special interest in one perspective and a desire to develop this perspective. It is rather the potential to see my phenomena in a better way that is my energiser; this way increases my interpretative repertoire as well as that of others. Other ways of seeing might do the same and might also improve research. We will see – that is another journey.

Also, the institutional reflexivity inherent in positioning practices is questioned by Alvesson et al. (2008). Why do we draw on specific knowledge claims? And why do we expect that our contribution should be accepted? I did change positions in my research process. In the first phase of my study, I planned the empirical data to be process data; stories of what happened and who did what when. This was feasible as my access to the SCMo development was almost unlimited. However, as the study emerged into the direction of strategic development, I changed the research design. My empirical material is another type of process data; stories of what happened, but instead of who did what when, different stories of what happened are interwoven in order to make sense of the development. These stories are chosen because they make a point of the history, the present and anticipated future. The claims of knowledge that I draw from the material are situated in my ontological position and I expect that the changed position is accepted because it is common that case studies evolve with the case.

I have already described my use of destabilising practices in the deconstruction of the subject matter and also the route I took in order to make sense of the concepts. The deconstruction is important but arguably the construction is at least as important. The material involved in the construction is historical documents such as empirical material from Professor Hertz's study in the 1990s, material provided by interviewees, other material in the form of

more freely accessible documents, such as published research related to the phenomena, material related to observations from meetings, from interview meetings, from working group interactions and, of course, interviews. The transcription of the interviews was a part of the first analysis of the interview material. I often comment on the transcriptions in Microsoft Word; they were a basis for formulating new questions after the interview occasion. These questions were then directed to the interviewee and to others not yet interviewed or already interviewed. The plan was to create meaning of the development. The two different phases of the study involved fundamentally different accesses to the research object. The first phase relied on participation in a project while the other relied on tracing; the access in the first phase was from inside the happening as a co-creator while the last phase was from outside as I weaved together interconnections in action. Both are feasible for a practice lens (Gherardi 2009), but I took that lens by the time of the second phase as the shift made me reflect on the design, what the case would be about and the outcome. The case is not set until the research process is over, and such casing (Ragin and Becker 1992) is advantageous in an abductive approach (Alvesson and Sköldberg 2008; Dubois and Gadde 2002). Flexibility to pick up inconsistent findings and explore what they are about is needed in order to explore and develop theory in unanticipated directions (Hall 2003).

In sum, interpretative research is possible in a wide range of approaches. I have reflected on the reflexive constructive approach I have used that ended in my choice to "see practice and its effects by a texture of interconnections in action", which is also mirrored in the presentation of the empirical material and the theoretical framework. This endpoint is a pragmatic result of a dialogue with the relational foundation I have accounted for. The trustworthiness is explained much in terms of plausibility in the research process and in the results of the theorising. It is connected to a relational foundation that also determines the value of the contribution in terms of the extent to which others choose to draw on the knowledge claims. The relational foundation acts as a feeder and enabler of the overall quality of a research project (Dutton and Dukerich 2006), not only based on trustworthiness but also in order to create interesting research. I have argued, in line with Czarniawska (2004a:136), that the usual scientific questions such as: Is this reliable? Is this valid? Or, at all, is it science? should be replaced by plausibility questions, such as: Is it interesting? Is it relevant? Is it beautiful?, because the account should be read and create interest in further conversation. A response to the latter type of questions is provided in this chapter by reflections on doing research and on writing research, and by theory construction reflexions. The response is based on my intersubjective ontology, but I am aware that some readers may have an objective ontology, and these would have preferred a methodology that fully represents the observed objects (Hatch and Yanow 2008). Objectivism is contrary to my constructivist/interpretivist study, but I would like to illustrate the quality of the work to all readers, rather than to readers with a specific

ontology. Dubois and Gibbert (2010) seek to provide common ground between an orthodox objective view and unorthodox abductive approaches, because too often methodological debates take place between proponents of different positions and are far from fruitful: "For instance, a case study relying on an abductive approach resulting in a case used both as inspiration and illustration to develop a theoretical idea, should not be judged based on Yin's or Lincoln and Guba's deductive quality criteria" (Dubois and Gibbert 2010:135). Their conclusion of how to bridge is to provide a transparent approach to the interplay between theory, empirical phenomenon and method. The transparency should make explicit the various stages in an effort to make the logic, reasoning and causalities evident. My approach of making research doing, research writing and theory construction transparent works to illustrate the choices made and their implications.

Chapter 5 - A note on Volvo Cars Corporation

In this first empirical chapter, I describe the firm Volvo Cars, its offering and its owner. The offer is inseparable from the products and the services of Volvo's suppliers and distributors as well as from the owner. The material in this chapter is based mainly on public sources. The next chapter includes the main theme of the story, the strategy of customer ordered production.

Business history

Volvo Cars has an exciting history dating back to 1927. The start-up by Assar Gabrielsson and Gustaf Larsson was a response to, or was at least influenced by, Ford. Ironically, 80 years later Volvo Cars was owned by Ford. In those days other automobile manufacturer start-ups had failed – it was difficult to get support from a financially strong owner.

Volvo, the original idea

An institutional assumption in the 1920s was that the Swedish mechanical engineering industry had machinery and competence; assembling parts into a car was almost the same as organising these resources. The debate favoured Swedish production of cars and Assar Gabrielsson was a spokesperson for such development.

Designing and introducing trendy cars was problematic. Mass production of standardised products was an issue but it was not realised because even the small number of cars produced were difficult to sell. The cars were not considered as beautiful. Volvo followed the US development especially in the design of engines and components while they designed chassis by experience-based learning. The introduction of an American-influenced Volvo car in Sweden failed. The business took off after Volvo introduced a custom-designed car that was successful in Sweden and, actually, also in the USA. The success was based on learning about technical solutions, productivity and commercial users such as the Royal Swedish Telegraph Administration, the Police and taxi-fleet operators.

Gustaf Larson formulated safety as a key feature of the Volvo car, and safety has been a cornerstone ever since. Safety was a core value in Volvo Cars to the extent that it was institutionalised in their organisational processes and a part of societal expectations. An example was the partnership between Volvo

Cars and the National Swedish Road Administration in the ambition that no one should be seriously injured or killed in the traffic.

The historical role of the network

Stephen Odell, CEO of Volvo Cars, in 2009 focused on the importance of partnership and cooperation with other stakeholders. Also the first CEO, Gabrielsson, who initiated and invested in the car venture, took advantage of what he informally described as "the poor man's wisdom" and formally as "producing the Volvo way", taking advantage of knowledge and resources outside the own organisation. Assar Gabrielsson and Gustaf Larson decided to start car manufacturing.

Larson designed a car adapted to Swedish conditions. Both had a background at SKF, which also supported the business idea and facilitated its organisation. The Volvo idea was to assemble and design cars. Production should benefit from Swedish suppliers' skills and machinery. Producing the Volvo way was about organising a production network based on long-term commitments. Volvo did not have the working capital or the skills to manage on its own. The standard of the mechanical engineering industry was good but often in practice only one supplier was possible based on the required qualifications, machinery and capacity. And how could Gabrielsson attract the suppliers' commitment? SKF was important for financial support but also for the suppliers' willingness to comply with Volvo's requirements. Gabrielsson expressed the dependence relationship as the smaller and the larger Volvo, where the latter included dealers and suppliers.

Volvo brought American best-in-practice methods and mentality in-house and to its suppliers. Gabrielsson recruited experienced employees, made licence agreements and arranged study trips to learn from skilled car manufacturers. Volvo made long-term commitments to the suppliers to achieve commitment to common development. Over time, in cases such as with the suppliers for gearboxes and engines, the suppliers were finally acquired in order to get enough commitment. As the business took off for Volvo and the company gained a stronger buyer position (in the late 1950s), long-term commitment and single sourcing was seen as a liability. The most important suppliers were acquired (also Olofström, which made chassis), and relationships with others were reviewed.

Top management over time

What is top management? Pehr G. Gyllenhammar was for many years the most dominating figure in the Swedish industry (in Volvo between 1971 and 1991) – a Swedish industrialist and a star who mingled with celebrities. Gyllenhammar's father-in-law and predecessor, Gunnar Engellau, was managing director of AB

Volvo 1956-1971. When he died in 1988, the obituary in New York Times characterised him as having carefully nourished Volvo's reputation for quality and durability, targeting customers by performance, longevity and operating economy. Engellau's predecessor Assar Gabrielsson was described as a skilful negotiator and entrepreneur in the start-up and development of Volvo.

Volvo top management has often been said to initiate specific car programs, development projects and decisions. Media have discussed that CEOs were actively brought in to develop an idea or a direction. In 1992, Sören Gyll succeeded Gyllenhammar and media reported the new CEO would make changes in quite dramatic ways. Leif Johansson, successor to Gyll in 1997 as the owner's, Volvo AB's, CEO and Tuve Johannesson, Volvo Cars' CEO became well-known for selling Volvo Cars to Ford.

Hans-Olov Olsson, CEO of Volvo Cars 2000-2005, Fredrik Arp, CEO 2005-2008, and Stephen Odell, Volvo Cars' CEO from 2008 are more recent and have been acknowledged by employees for specific development and for being dynamic figures in the organisation. Their intent and decisions were linked to different streams of development. Few communicate directly with them; to get, for example, a project approved, it should be presented as a business case on a lower level before getting attention from the management. To get through that barrier, the politics around the idea plays a role to create a stir in the organisation. With Ford as owner the politics was a combination of "Ford says" and in-house opinion. Top management was admired and criticised, seen as loaded with power and possibilities and still restricted by Ford's agenda. In good times, for example when Volvo was acquired, Jaques Nasser, Ford's CEO, emphasised the importance of retaining the Volvo way of doing business as long as the company performed well, which opened up for integrative as well as Volvo-specific development. However, in the late 2000s Volvo was on Ford's list of companies to sell and then people were relieved that the integration was incomplete, but a few years earlier they had said "we need to put our heads together for synergies". In this line of reasoning, top management worked hard to reduce uncertainty and created an environment for development. Managers spoke to the organisation and were interpreted as a frame of reference.

The ongoing business

Sales and production

In 2009, the USA was the largest market by volume before Sweden, which was the largest market by market share. Thereafter, in a decreasing sales-by-market order, came the UK, Germany, Russia, the Netherlands, Italy, Belgium, China,

France and others. The sales volume/production volume developed as in Figure 5.1.

Figure 5.1 Sales volume and production volume. Source: Data from Volvo Car Corporation's sustainability reports 2000-2008.

In the 2000s, the workforce was reduced; sales and profit went down as illustrated in Table 5.1. The financial results were only reported as a note in Ford's annual report. The table shows information from Volvo's sustainability reports in which some financial data were reported and commented on by the President and CEO. Over the period in the table also customer satisfaction declined.

Table 5.1 Volvo Cars figures. Source: Volvo Cars sustainability reports from 2000 to 2008 supplemented by business press reports (Lars Anders Karlberg, Ny Teknik, 26 August 2004 and 27 August 2003.)

Year	Sales volume	Work-force	Revenue (million USD)	Profit, estimated (million SEK)	Profit before tax (million USD)	Comments, financial results
2000	422,000	27,400		6,000	N/A	
2001	420,000	27,415		6,000	N/A One of the best sales and revenues years ever	
2002	406,695	27,990		3,000	N/A A profit although slightly decreased	
2003	415,046	28,000		9,000	N/A Sales and profitability positive despite weakness of the dollar	
2004	456,224	27,575		Profit	N/A Record sales, one of the most successful years ever.	
2005	443,947	27,339	17,109		377	A 3 % sales reduction
2006	427,747	25,550	16,105		-39	Lower sales and profitability
2007	458,323	24,384	17,859		-164	Record sales but financial problems
2008	374,297	22,732	14,679	ca. -8,851	-1,465	Sales down

In 2009, the major production facilities were in Gothenburg, Sweden and Ghent, Belgium. A product-specific joint-venture facility was in Uddevalla, Sweden and a product-and-market-specific facility was in Chongqing, China. In addition, a fraction of the volume was manufactured by completely knocked-down assembly in Malaysia and Thailand. Volvo Cars was a relatively small car manufacturer holding 1-2 per cent market shares in its principal markets, with the exception of Sweden, where Volvo had a market share of 20 per cent. The main production in Sweden and Belgium and the relatively high sales in the American market were a challenge when currencies fluctuated.

The 400 suppliers had been instrumental to Volvo Cars in that about 70 per cent of the car's value came from suppliers. Long-term cooperation with Volvo was common and many suppliers were involved in the design phase of new car models, which shortened lead times in development and production. A large number of suppliers were located in close proximity to Volvo Cars plants in order to reduce transport times and stock-keeping. The supplier people

involved in designing and producing components and systems were about twice as many as those at Volvo Cars.

Offering

Since the late 1990s Volvo Cars' product range was regarded as customer oriented, which makes the company relatively responsive to changes in demand. The flow of new products was based on product development out of platform management and cross-functional teamwork. Dealers were satisfied with the opportunities that Volvo offered in terms of products. Figure 5.2 illustrates the more frequent product launches.

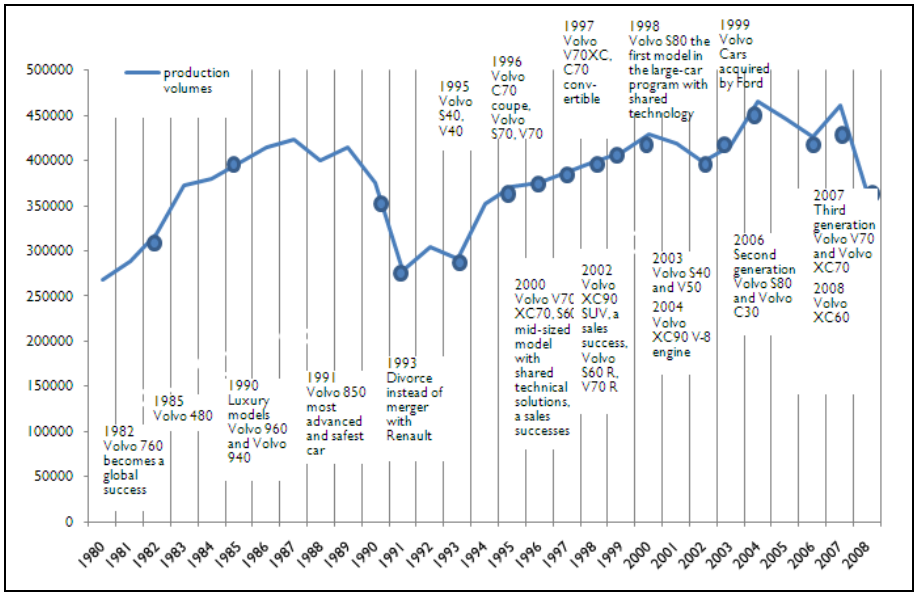


Figure 5.2 Historical milestones in terms of products and production volume. Source of production volume: Bil Sweden. Source of milestones: Volvo Cars 2008/09 corporate report with sustainability.

Volvo Cars' offering was based on three core values, quality, safety and environment. In 2000, private customers' main reasons to buy a Volvo were primarily safety, then in order of preference quality, design and image or brand. Volvo Cars' values were seen in a brand pyramid and prioritised on three levels. The foundation was the basic requirement for all premium car brands: premium quality, customer experience and driving dynamics. In the middle of the pyramid the differentiators were modern Scandinavian design and environmental care. At the top of the pyramid was safety.

The offering content has changed over time. As to quality, originally it was a matter of a Swedish car matching Swedish conditions; in the late 1940s, quality became associated with durability. In the 1970s and 1980s initial quality became important, which was an interpretation much promoted by Toyota. And in the 1990s, perceived quality became paramount. In the 2000s, sales service and after-sales service became an increasingly important feature in which customer closeness was key. An example from the late 2000s was related to ownership of an XC60. It was a first step of how Volvo tried to involve care of the customer in its contact with Volvo's service organisation. The car owners had, among others, a personal service Volvo technician to assist in the car owners' experience and increase the car owners' transportability.

In 2001, US customers were 52 per cent women and 48 per cent men, 59 per cent of the cars were bought by private customers and 41 per cent were company/leasing cars. The USA was the single largest market for Volvo Cars. In the United States the buyers select from dealer stock about 90 per cent of the time, according to reporter James Cullen, Automotive News November 18, 2002. European buyers (Spain, Italy, France, Germany and the UK) were 15 per cent women and 85 per cent men; 67 per cent of European customers were private and 33 per cent were buyers of company/leasing cars.

The aim of Volvo Cars in the 2000s was to become number one in customer satisfaction in the premium segment of the car industry. In 2003, results from 25 independent quality surveys were used to cumulate a customer satisfaction indicator in which Volvo Cars was ranked among the top three in 12 per cent of the surveys (a decline from the 15 per cent of previous years), which increased in 2004 to 17 per cent. In an indicator of top ten best-ranked car brands, Volvo fell from 65 to 50 per cent but increased in 2004 to 71 per cent. In surveys from J.D. Power and Associates, which are important in the US market, the fifth place from 2002 had dropped to eleventh place in 2003 and fourteenth place in 2004. Customers' needs , among other things, were identified in regular customer clinics with various groups for feedback. In 2004, about 300,000 customers' opinions were compiled from surveys and telephone interviews, of which 3,000 were in-depth interviews in focus groups, customer clinics, etc. A committee was set up to ensure that product development was influenced by customer perceptions. In addition, a brand campaign was used to guide customers through a learning process.

In the decline following the financial crisis in 2008, demand changed towards smaller and environmentally friendly cars. Media accused Volvo Cars of a misinterpretation of the environmental trend and a misaligned product program. Very soon thereafter, Volvo presented the DRIVe concept that was used to update the environmental properties of three models. Besides environmental development, safety was a core value, exemplified by the recent city safety concept delivered in the S60 car. The interpretation of one value influences others, but safety is frequently prioritised when it comes to development projects.

A long-term challenge has been to increase sales volumes. The marketing side struggled and argued that the products were not differentiated enough and therefore sales of new models cannibalised on sales of existing models. Development was to a large degree built on in-house knowledge and cross-functional teamwork even though it had involved external parties to a greater extent, such as female premium car buyers and local authority of traffic safety. The core products offered in 2010 were three cross-country models (XC60, XC70 and XC90), two estates (V50 and V70), three saloons (S40, S60 and S80) and two coupes (C30 and C70). In the configuration of a model, a customer first decides on model, followed by engine (with transmission), equipment levels, exterior options (colour, alloy wheels and other options) and interior options (upholstery material and colour, trims, steering wheels and gear knobs). In all there is a huge number of accessories of which some are included as standard or not available at all at specific markets.

Owner

In 2010, Ford Motor Company, based in Dearborn, Michigan, United States, manufactured or distributed cars with around 198,000 employees and about 90 plants worldwide. Ford's brands included Ford, Lincoln and Mercury besides Volvo Cars that was sold in 2010. Ford Motor Company acquired Volvo Cars in 1999 and the firms were seen to have complementary goals. The Ford CEO Jacques Nasser, known as a cost-cutting CEO, assured media that under the assumption that Volvo was competitive, Volvo meant Swedish and should be managed as usual and its goals of assortment, growth and knowledge base were important to Ford. To Volvo, the new owner was a relief in terms of sharing development costs. The potential to share development costs not only for Volvo models but also for Ford models meant much in terms of economy of scale. The Volvo CEO, Tuve Johannesson, trusted Ford's capability to manage different brands and was challenged by a growth opportunity based on new cars, new customers and new markets.

People within Ford and Volvo were interested in learning from each other. The acquisition meant that Volvo people had access to the resources of one of the world's largest car producers, such as skills and practices. And top management was interested in synergies. Ford was a huge partner for Volvo, and Johannesson was especially interested in taking advantage of its markets in order to finally reach substantial volume growth and lower costs via scale economy in the purchasing of model-common components.

Commonality implies a potential cost benefit and a threat to each brand's characteristics and each model's specificity. Common components were identical in the sense that they were used in the same way by different product lines. This differs from similar components that were principally based on the same solutions but modified to some extent, and unique components that were used for one car. The degree of commonality was important to simplify and

gain economy of scale. Both Ford and Volvo used common components in their existing models before the acquisition. But the potential to save costs increases with more models based on the same platform. However, the ambition to increase the use of common components with Ford was far from straightforward, despite both parties' willingness. The difficulties involved relate to the firms' different processes and structures.

First, Ford defines commonality based on the platform while Volvo takes the details as a starting point. Second, the collaborative process had great legitimacy because it was urgent and interesting. But several adaptations had to be made in, for example, the working procedures. The expressed goals were politically sensitive and not connected to each party's needs and strengths. Consequently, decisions had to be made in the working groups in which Ford was somewhat dominating based on different ways to communicate and the fact that they knew more about Ford's decision hierarchy. This leads to compromises and affects the brands' development potential. In Volvo's case this means that safety did not get the attention and priority it normally has. Compromises were necessary to achieve commonality. Third, the compromises were supplemented by a blunt cost control system. Ford's sharp cost focus was new to Volvo. And, added to the compromises was a cost control system that impaired some of the usual quality assurance regarding the components. Fourth, the structures where to place the common components when these were in use differed. Ford's and Volvo's assembly lines were different and put different demands on the components. The technical structures of engineering, purchasing and production were different, which resulted in increased indirect costs of adding the components to the structures. In this project the number of common components achieved was successful and most likely also generated cost benefits in the purchasing. However, the effects on the possibilities of the products to transmit core values and the cost of implementing the components into structures and processes were indirect, sometimes long-term effects and difficult to evaluate.

The product development process was influenced and reorganised based on learning from Ford. However, the two companies differed in the R&D process when it came to relationships with their specific production systems, organisations and responsibilities. Especially engineering standards, product architecture and release systems differed. While Ford more easily carried out advanced engineering projects, Volvo's strength was in product platform projects. A Volvo problem was that differences in accounting principles, the basis of decision-making, resulted in product project cancellation due to inadequate financial arrangements.

Volvo adjusted its product development system in line with the development processes used by other brands in Ford. The new system was called the Global Product Development System and was based on Ford's appreciation of Mazda's product development system. Volvo used it to include the voice of the customer in the process. This voice was induced mainly from

quantitative sources to create a target customer while the perceptions of customer-reference groups and dealer groups were rare. The annual product development process was divided into a ten-year product cycle plan covering all products, and each product was seen as a linear process that developed concepts into business concepts and further into business projects that resulted in manufactured cars worth their price.

Ford's relationship with suppliers was seen to differ from that of Volvo's. Quite a few of those involved in relationships with suppliers, particularly those on the supplier side feared what influences Ford would bring in. However, Ford stated a new approach to suppliers in 2007. They had decided to improve, and forever change, their supplier interface. Fredrik Arp explained the key benefits of the approach to suppliers at the Big Supplier Day:

> "First, it provides the necessary financial returns, promoting the financial health of both Ford and our strategic suppliers. Secondly, it fosters a spirit of collaboration and mutual trust. Lastly, it provides our suppliers with sufficient scale and planning certainty to enable them to make appropriate long-term investment decisions. Through these elements, we will integrate our supply chain management and deliver high quality, technologically innovative, affordable products to our customers.
>
> At the cornerstone of this new model is the Aligned Business Framework or ABF. A document which outlines the new Ford/Supplier interface. This is a non-binding document. It is the framework that encompasses our vision for our new business relationship with our strategic supplier family.
>
> Let's be honest…we don't have our suppliers' trust today. To earn this trust, every organization and every person within Ford that interacts with the supply base must understand the elements of the ABF and communicate them consistently to our suppliers. This will take time, but more than that, it will take management commitment which was confirmed by Mark Fields, Jim Padilla, and Bill Ford in the recent Way Forward message."

How was Ford influencing Volvo? Was Ford the nurturing parent as argued by media and as indicated by its track record with, for example, Jaguar? Or, was it streamlining Volvo by withholding finances for development and enforcing the American way? Top management from Ford as well as from Volvo argued that the two brands complemented each other and would be kept apart. Actually, the CEO of Ford enforced that Volvo should follow its path. However, both Ford's CEO and the CEO of Volvo were renowned for their cost focus, and that focus might have been enforced when they came into the same management group.

Some middle managers claim that Ford was responsible for enforcing cost reductions and volume growth as objectives in a way that was detrimental to producing the Volvo way. Others claim that Ford, as owner, had nothing to do with such development. In the collaborative processes, Ford people were appreciated as they provided learning opportunities. However, the learning was based on getting into Ford's working procedures, routines and evaluations of what was good and bad. One example was the functional expertise's experience of the delimiting management by objectives, and another example was the evaluation of purchasing that was based on costs and marketing, evaluated on growth rather than as an integrated part of "producing the Volvo way" (which will be discussed in the next chapter). After the failed Renault merger, suppliers became important partners, and such adaptation to suppliers and customers competed with adaptation to Ford because of resources. In that line of reasoning, Ford was influential on Volvo Cars' orientation because integration issues competed for resources with other development projects and were prioritised.

Organisation

The business of Volvo Cars was divided into several areas in 2010. Product development and design and purchasing were based in Gothenburg. Manufacturing, which was also responsible for delivery worldwide, including component manufacturing, car production and assembly, was situated in Sweden, Belgium, China and South-East Asia. Marketing, sales and customer service had their headquarters in Gothenburg, and about 100 national sales companies were in the proximity of about 2,400 local dealers worldwide. They were responsible for commercial market activities and customer interaction. Public affairs, quality and customer satisfaction, human resources, finance and legal matters were other business areas (www.volvocars.com, business areas, downloaded 1 April 2010).

"Profitable growth in a competitive market"

The heading is a quote from the CEO of Volvo Cars, Fredrik Arp in 2006, and was as well a part of the preceding CEO's business planning. Arp's business goals were volume growth, 600,000 cars by 2009, and 5 per cent profit after tax in 2009. Arp suggested that prerequisites to these goals were successful launchings, new markets and market segments, improved product quality and a highly effective industrial system.

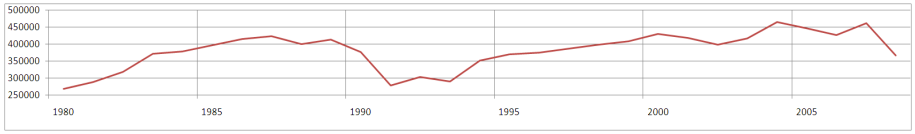


Figure 5.3 Volvo Cars' total production volume 1980-2008. Source: Bil Sweden/FKG.

Volvo Cars' sales volume was seen as a problem area with too little growth. Figure 5.3 illustrates a downturn in the early 1990s and thereafter a steady but small growth in volume until 2000. Thereafter, the trend was difficult to estimate.

However, Arp compared Volvo Cars' volumes with those of other manufacturers of premium cars, Audi, BMW and Mercedes-Benz, from 1997 to 2005. In that perspective, Volvo was not only a small actor in the industry, it was also small in its segment and became smaller in comparison with the others. In 2005, Volvo grew by 12 per cent but Audi, BMW and Mercedes-Benz had grown many times more. The potential of the other manufacturers shown in Figure 5.4 was argued to be a reason for volume growth also for Volvo Cars.

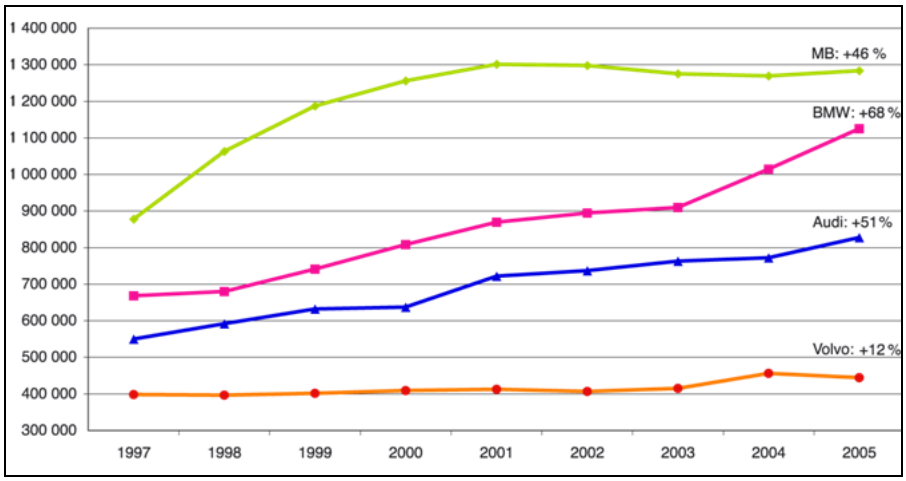


Figure 5.4 Volume growth comparison by Fredrik Arp, CEO of Volvo Cars, in 2006. Source: Presentation from The Big Supplier Day 2006, FKG.

The trends outlined by Arp in relation to the volume discussion were demands for more product attributes, adaptations to new regulations, environmental demands, and improved safety, shorter life cycles and steady or somewhat decreased prices. These trends were complex in that stronger development programs, more attributes and adaptations were costly and seen as necessary in order to attract customers. And the conclusions that Arp drew from the

volume growth comparison related to suppliers, costs and customer service. First, who should do what in terms of development and investments was discussed in terms of OEMs, tier-one suppliers, tier-two suppliers and tier-three suppliers. Second, a bigger scale would be needed to manage development costs. Finally, service and accessibility needed to be of a global character.

Business future

What were the future prospects? Odell, the President and CEO, in 2010 discussed that challenges for Volvo Cars and the automotive industry were to adapt productions and cost levels to the changing market conditions and industry volumes. Further investments in research and development were needed despite a difficult/ financial situation, taking customer expectations into account. Volvo Cars needed outstanding development of new products and technologies in terms of safety, ecological values and design. Odell's view of a profitable future was that Volvo Cars' values and innovations had to translate to the needs and desires of the final customers in the market, in partnership and cooperation with other stakeholders.

Magnus Jonsson's proposition of the future in 2009, based on Volvo Cars' market intelligence, was that the continuous change in the automotive industry, together with signs in divergent directions, made the situation difficult to assess; however, it started to change for the better. Jonsson's insight into future development was related to his position as the senior vice president of product development and member of Volvo Cars' top management team with responsibility for all development activities at Volvo Cars. Regarding the offer to the customer, Jonsson proposed that expectations were both increasing and more distinct. For premium brands, competition was stiff in terms of car performance, design and attractiveness, especially the environmental performance. The Volvo brand key advantage was safety, followed by the Scandinavian design and the environmental care in addition to the basic demands of a premium brand, quality, customer experience and the pleasure of the driving dynamics. The goal was to make innovative and customer oriented solutions. Jonsson characterised Volvo Cars' capabilities in product development as world-leading safety development, design development, development to reduce fuel consumption, and Volvo Cars' effective and cross-functional working methods. In the light of Volvo's limited scale, despite their capabilities, they planned technology development by a differentiation into three classes.

First, the most important and Volvo-unique development was dependent on their own intellectual property and in-house capabilities together with leading suppliers in long-term relationships. Second, key areas of development, which differentiated Volvo from other premium brands, were dependent on system suppliers acting in long-term relationships with Volvo and a common

intellectual property. Third, premium-unique development used by many premium brands was instead dependent on the suppliers' intellectual property, bought and integrated by Volvo. Jonsson's hypothesis of the future was that superior customer expectations would be satisfied together with suppliers by new technology and value in the product, close collaboration with suppliers in important areas, long-term supplier relationships, consolidated supplier base, competitive prices and lowest total product life cycle cost.

Ford had been a partner in the ongoing business and collaboration was established in different areas. Ford was a strong owner, but not financially, which directed the Volvo way of business sometimes by a bottom-up approach and sometimes by a top-down approach. However, in 2010, Volvo Car Corporation and related assets were sold to Zhejiang Geely Holding Group Company Limited. As described in a press release (www.ford.com, 28 March 2010), Alan Mulally, Ford's president and CEO, argued that Geely's ownership would provide a solid foundation for Volvo to continue to build its business. In several areas Ford and Volvo Cars would continue to cooperate, in order to ensure a smooth transition. For example, Ford would continue to supply Volvo Cars with powertrains, stampings and other vehicle components. Also, engineering support, information technology, access to tooling for common components, and other selected services were planned to ensure a smooth separation process. Lewis Booth, Ford's chief financial officer, discussed that Volvo's starting position was with a best-ever product range based on its core values – safety, quality, environmental responsibility and modern Scandinavian design were promising. And Stephen Odell added that the new owner was promising when it came to providing Volvo Cars with the necessary resources, including capital investment.

Others were less certain. The workforce, cited in Swedish daily news media, expressed doubt as well as faith. Volvo labour unions, which had been critical of the proposed deal and had complained about a lack of information about the future of the company, said they now backed the takeover (Victoria Klesty, www.reuters.com, 28 March 2010).

Potentially, the volume targets will be easy to reach. Li Shufu, Geely's chairman, planned a factory in Beijing in which 300,000 Volvo-branded cars would be made (Victoria Klesty, www.reuters.com, 28 March 2010). Still, Geely's plans were to keep production lines running in Europe, because it was important for Volvo to stay close to key supply centres. "*I have a deep belief that the manufacturing footprint in Gothenburg and Belgium will be preserved in the longer term*", Shufu said. Therefore, Volvo Cars would remain a separate company with its own management team based in Sweden. Geely's ambitions had been to move into Western markets but Geely lacked the technology and brand recognition. Thus, the Volvo acquirement was planned to help the Chinese carmaker to get around obstacles.

In short, there were different aspects about the future, and a new owner had been expected by many at Volvo. After years of integration Volvo had been

asked to restructure to be more independent. The uncertainty of the future was related to the market as well as to the own firm.

In this chapter, I account for a company note in order to frame the development and describe my view of the scenery around customer order based development. The objective is to locate the case in its wider milieu. It is mostly based on secondary material described in Appendix 1. A company has a history and a future, and its own interpretation of these influences the ongoing happening of actors involved and the study at hand. I typify the chapter as a note because it is an excerpt of the case company, chosen because of its importance to the development of COP. The case company situation interacts with the introduction and development of COP, which will be illustrated in the next chapter.

Chapter 6 - Customer ordered production

This empirical chapter tells a story that is based on actors' experiences of Volvo Cars' strategic development with regard to the introduction, in the early 1990s, and development of customer ordered production, COP. It is based on my inquiry in which questions where added for knowing based on knowledge. It was written to highlight some of the innumerable problems and opportunities related to managing a customer's purchase of a Volvo car. The story about the strategy of customer ordered production is narrated in the context of Volvo Cars' ongoing happenings and the automotive industry's aims of build-to-order strategies. The development of one process is not entirely separable from that of others. Therefore, this chapter illustrates COP in a setting of development while the next empirical chapter will go into the effects of what happened. In the different ongoing processes one development might challenge or spur the development of others. In Figure 6.1. ongoing processes are displayed in a trendline of total production. Each development process has its own story, but as my case is about COP development, the following story relates the other processes to COP development.

Outlining this chapter, I will first describe strategic development, as well as assumptions of COP together with other assumptions, of volume growth and customer orientation, important to the development. Next, I will describe how planned development in the course of COP takes place (or not) in terms of approving projects. Thereafter, the COP strategy is elaborated on in terms of what it meant for the essential order-to-delivery process and for specific related tasks. Finally, in order to understand the specifics of the strategy, I illustrate other automotive manufacturers' development of COP in relation to that of Volvo's.

Strategic development

From the late 1990s until the early 2000s, a description of development is likely to be a note on strategic development. In this note, simultaneous strategic processes, development of objectives and customer orientation are illustrated.

Ongoing strategic themes

The strategic change project of 100 per cent COP was initiated in 1992 and involved customer orientation, delivery precision and lead time reduction. Customer oriented product development implied radically changed organisational work and more new products, moving from developing a new car every three or four years to launching a new car every year. The loss from 1992 (about -1,700 MSEK), was turned into a profit in 1993 (about 630 MSEK)

and thereafter it steadily increased with AB Volvo as an owner, until the late 1990s. The new business and product strategy, communicated in 1994, involved this radical increase in the product portfolio. The plan was to broaden the existing product program in order to offer products to the customers in all stages of their lives.

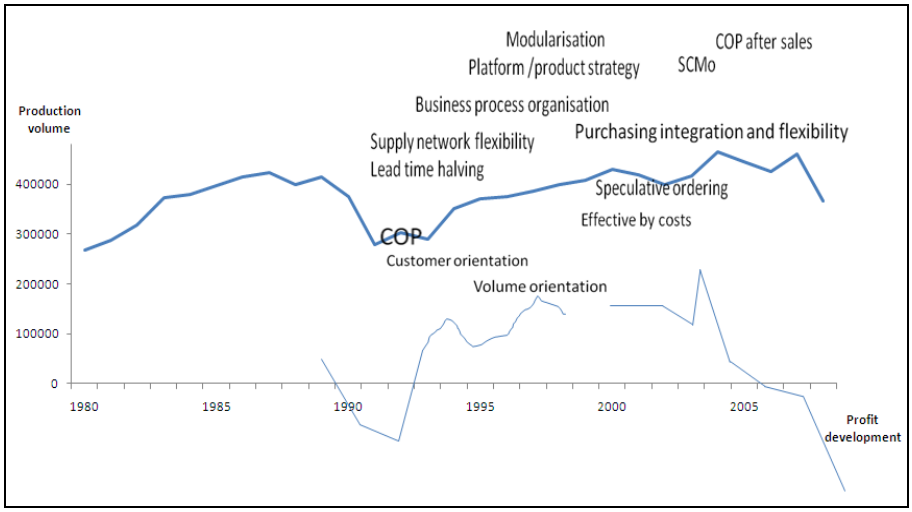


Figure 6.1 Ongoing processes encountering each other (see profit estimations Table 5.1).

Critical issues in the management of product development were to explore and build knowledge on state-of-the-art concepts such as platforms, modularisation, simultaneous engineering and cross-functional teamwork with top-down and bottom-up perspectives to manage change and remove obstacles. Concurrently, other operational ways to do engineering work were explored.

The profit statements after Ford's acquisition of Volvo Cars were hidden in Ford's reports but Volvo Cars "leaked" to Swedish media that they had some quite prosperous years until 2003. As is indicated in Figure 6.1, the sustainability reports confirmed such a development, commented on by the CEO in 2001 as "*one of the best years ever for VCC, in terms of sales and revenues*", in 2002 "*since Ford's acquisition in 1999, VCC has returned a profit although profitability has declined slightly since 2001*", in 2003 "*sales and profitability positive*" and in 2004 "*record sales, one of the most successful years ever*". In 2005, Ford released some information related to Volvo Cars' results in a decline and in the next year in a loss. However, the same year, 2005, Volvo Cars CEO stated in the sustainability report about the financial performance that "[*T*}*he trend in profitability was positive despite the weakness of the dollar. Volvo Cars has recorded a profit each year since the company was acquired by Ford Motor Company in 1999*". Also in 2005, Volvo Cars streamlined operations and restructured the organisation for

future profitability. In the sustainability report the arguments were: "*The decision to restructure during a time of profitable growth was seen by many as a surprise. However, Volvo Cars decided to proactively, preview itself in a time of strength and investigate where we could save money by cutting back areas that were outside the core business and removing duplicated work*". The production volumes declined to 420,000 in 2001, and further to about 400,000 in 2002 but increased to 466,000 in 2004.

Volvo Cars aimed for cost effectiveness by best-in-class efficiency in the manufacturing and implementation of Volvo Cars Manufacturing System in the late 2000s that involved standardised working methods, such as Ford's Six Sigma method, lean manufacturing and team development. Also, standardised purchasing structures, factory interfaces and extended product collaboration between Volvo Cars, Ford of Europe, Jaguar and Land Rover were under way in 2004 and 2005, in order to be implemented thereafter. IOS (International Operations Synergies, situated in England) dealt with product development, which means standardised processes, methods and tools. Volvo cars had, however, already been working much with development, and teamwork and collaboration was considered to be a strength of the company. At Volvo Cars, a previous development project had related to using platforms in future cars. In the platform project, the following was decided:

- All cars based on a platform shall be modularised and developed with a high level of common systems and components
- Modularisation shall be carried out in long-term partnership with suppliers exercising their own development resources
- A common variant-flexible assembly process shall be used in production
- A common engineering procedure shall be used in the development

A platform was a group of cars with similar market position in terms of price and size, architecture, manufacturing process, working procedures and supply chain. The 1996 platform approach involved a major organisational change and a change in the office environment. Team members from different functions were co-located from functional units to module teams. The module teams were responsible for modules needed in several car projects. Also, the module members worked on a common agenda along their functional tasks. Co-locating the people involved resulted in a more efficient daily communication and decision process that radically improved key activities such as engineering methods and IT utilisation, which in turn improved the product development process. As a consequence, between 1995 and 1999 the number of employees in product development increased by 7 per cent and the output of new cars grew by 65 per cent. Decisions about module concepts with reference to, for example, customers or manufacturing costs, now became more holistic because they related to several car projects. Thus, modularisation meant that responsibility for production and product development lay with the module

teams. Besides the module teams, platform managers were responsible for issues related to the platform and project leaders for the unique cars. This complex organisation was an innovative and creative period for people involved in product development. New procedures of work and decision making evolved over time and new managerial roles were created, but a great deal of problems also occurred with frustration and functional managers that were not involved to the same degree.

The module teams were cross-functional and their people had experience from various organisational functions such as purchasing, production, R&D and service. Twelve module teams of different sizes and expertise coordinated activities and resources in their product module(s). The module teams were Hood and latches, Marriage point, Floor, Cockpit, Doors, Inner trim, Electrical, Upper body, Engine, Transmission, Interior and Exterior. If these module teams involved several product modules such as, for example, the marriage point that involves the exhaust system of the product module, fuel tank, rear axle, spring strut and wheel, then the larger team was divided into subteams per product module. Thus, the modularisation and the platform approach created a complex organisation of resources, such as skills, machines and financing of development. The complexity increased further because some modules were managed by externally owned suppliers. In the modularisation process, issues that related to the wider organisation required managerial attention. Also, the modules were interdependent because they had parts and technologies that should function as an entity across the modules. Consequently, a decision in one module team affected other teams. The interdependencies across the product modules could sometimes be coordinated by mutual adjustment and sometimes they became a managerial issue. As a whole, the platform approach increased the complexity related to projects. This resulted in interdependencies across products, across functions and over a longer period of time. The coordination of these interdependencies imposed heavy demands on those involved. Many issues were left hanging because the overall concept was too complex to be handled on the operational level and too complex for the managerial level to appreciate the effects.

The platform approach involved cross-functional organising. It substituted a product development organisation and brought in cross-functional expertise in new car project groups, that is, different functional area staff worked on tasks related to the project and met every week but the daily work was functional. Such development procedures took a long time and car projects were serial – one after another. The organising activities that the platform approach involved became more complex. The outcome was seen as successful based on the increase in output of new cars, the new working methods and the reorganisation. Consequentially, vertical and lateral communication and real-life experimentation were seen to have particular importance in the development. In the platform project, the cross-functional organising led to lateral communication. The common experimentation resulted in an effective mutual

language in the vertical dialogue together with quality and efficiency in the decision process. Experimentation with methods and settings led to new understanding and facilitated the development. The platform organisation was added to the functional organisation. Some people in the functions were involved in experimenting but the traditional organisation was not involved.

Development of objectives

Communication and experimentation were in some cases seen as problematic. For example, in the early phases of product development prior to the start of the car projects, there was a great deal of interaction in meetings between marketing and R&D, but this was based on functional expertise rather than visionary collaboration. The resulting problem was seen as a more-of-the-same-products development rather than complementary and differentiated products. Meeting-based interactions were perceived to never take off in collaboration. Product development of environmentally friendly products was an example. Top management decided in 1993 that core values should be exploited to increase volume growth. In the making, Volvo relied heavily on mutual adjustments between resources in its attempt to industrialise a bi-fuel car.

More specifically, the project cooperated with local government and fleet customers; the company used an existing technological platform and a particular manufacturing and sales organisation for modified, special cars in the industrialisation. The adjustments were beneficial to offering the bi-fuel car to fleet customers and to beginning production and sales. When the cars finally got incorporated in the ordinary organisation, some resource dependencies could be altered, such as technology and manufacturing, but the ordinary sales organisation could not make sense of the offer. It was a part of another agenda. Since 1995, a management agenda of short-term performance and costs was emphasised. And, as the bi-fuel car finally arrived in the normal sales organisation, it was seen to have low volumes and higher costs and to be a more complex product with weak customer-involvement incentives. Based on the development, a business strategy manager (an action researcher) initiated a company-wide discussion about environmental issues as objectives of the common good and the private good. The discussion concluded that the environmental trend was seen as genuine, but despite customers' intent to buy environmental performance they tended to buy car performance. And from a final customer perspective, the bi-fuel car was a variant in a car model that had a weaker engine, substantial additional costs and reduced trunk space and needed to be refuelled at two different locations. Consequently, this variant penalised the customer in the purchase and in the usage over time. Communication and experimentation were effective when it came to making things happen but the two examples of more-of-the-same development and development of an environmentally friendly car indicated that the strategic development depended on the process of interacting and on who took part.

Visions and customers' preferences were fuzzy objectives that were uncertain in a complex development process.

How was such fuzziness dealt with? Concept cars were one example; they epitomised ideas to the working group and to media, whose attention was important. Concept cars were prototypes used to present visions of future design and technology. Another example was existing and well-known structures for communication and experimentation, such as in the annual product idea generation. New and differentiated products in the premium segment should be connected to customer preferences. Top management expressed a Volvo Vision 2020 that related to product development, organisational capabilities and profitable sales and services. By developing products based on Volvo's capabilities regarding environment and safety, public benefits were included, i.e., the common-good technology. The private benefits, expressed as private good, were highlighted in the offer and in communication with customers. The Volvo-specific knowledge should be used to set targets and from there idea creation should take off. One year this process was initiated by a group of four employees with experience of business strategy, product planning analysis and market research. This group took off from the previous year's identified trends, new research reports and Ford's results and discussed these in weekly meetings. The team of in-house expertise evaluated the input and chose a set of trends that were wrapped up and presented to a wider group of in-house expertise, which turned out to be unconstructive and resulted in individual wish lists for new products and an expansion of the present product program. To move on, the team prepared a new meeting and invited a wider group of in-house expertise, but this time they were specific about who should participate and how the meeting process would be facilitated. This resulted in a ranking of concepts, including styles, properties and features, aligned to trends. Such a working method was an open process in which decisions relied on the immediate participants and input data. The input data made up a framework of immense data of input from public, established sources for the whole automotive industry and from the exclusive Ford source (Ford's idea generation process). The data were used as trustworthy references. The Volvo differentiation was left to the selection process of the participants, first in the smaller team and then in the wider team.

Customer orientation

The differentiation relied on customer orientation, which had been a central aspect of the strategy since the early 1990s. Actually, when Hans-Olov Olsson took up his duties in 2000, the CEO staff felt a lack of genuine end-customer knowledge within the company. Therefore, Olsson challenged the top 300 managers regarding how customer knowledge could be increased so that everyone could take action with the goal of customer satisfaction. The top managers were divided into 27 teams and had a time frame until the next

meeting, six months later. A total of 112 activities were generated. The results showed that the managers interpreted the task of customer orientation very differently. Only six activities involved actions that directly affected customer value, such as new ways of involving customer input. However, only one third of all activities had a clear external focus, such as gathering and sharing information with supplier, customer and dealer reference groups. Most activities took place within a function or in contact with other internal functions. In addition, most managerial actions were policy-oriented and of an administrative character rather than experimental. Many focused on existing standard customer research into present Volvo customer needs, rather than exploring new customer information. Overall, little was externally oriented. Thus, the top managers' ideas differed considerably regarding what was customer orientation and how to approach customers.

Apparently, the customer concept was somewhat abstract. The customer was seen as more demanding and a problem as described in, for example, financial statements and research reports from the automotive industry. The customer was also seen as a resource in the development of new products in strategic discussions together with other stakeholders. Lex Kerssemakers, senior vice president of brand business and product strategy at Volvo Cars, argued "*If the competence doesn't exist in the company then we have to build partnerships that provide insight into how these segments think and what they want.*" Examples presented in 2005 were joint work to learn about traffic accidents in Thailand and bring about changes together with the Thai government and joint work with the Swedish Abstaining Motorists' Association to prevent driving under the influence of alcohol. In order to improve the car's interior air quality, Volvo Cars cooperated with the Swedish Asthma and Allergy Association to reduce levels of, for example, pollen and gases in the car. However, the customers' role in Volvos development seems to have changed over the years.

Volvo Car Corporation's business orientation was dynamic; Liu, Roos and Wensley (2004) described it as a historically cyclical pattern in which Volvo Cars shifted from a focus on its market to a production focus and then shifted again with COP. Volvo policy between the 1930s and the mid 1960s was to interact in relationships with customers, and the company adapted cars to customers and customer groups. Between the mid 1960s and the 1980s, operations of Volvo Cars moved towards being more production-driven. Management attention and resources were drawn to problems associated with mass production, and decentralisation and better working conditions, among other things, were prioritised. Production should be reliable and safe. At the end of the 1980s, the entire international automotive industry had a huge overcapacity. In the early 1990s, Volvo's top management team gave priority to the customers. The strategic turnaround focusing on lead time and customer ordered production took off with the CEO pleading for customer attention from the then hundred top managers. The message was that Volvo did not make profits by producing cars on speculation, but only on customer ordered

production. Related to this was the crucial need to listen to the customers and sell cars that customers wanted. Further, it would be reasonable to give the customers a lower price on customer ordered cars because costs related to the car would be lower related to, for example, inventories. Over time, the customer creed has been sustained but prices are higher for customer ordered cars, not only because of extra accessories but because the differentiation allows a premium price. Hans-Olov Olsson viewed Volvo as a niche manufacturer and the following President and CEO Fredrik Arp accentuated that innovation was central to the development. Innovative capacity called for a workforce, customers and societal stakeholders, which resulted in car models with safety innovations such as collision warning, smaller designed safe cars such as the C30 and the combination of larger cars with alternative drivelines.

Thus, customer orientation was abstract and customer ordered production was a way to practice it. Operationally, a customer order initiated the production of a car; thus every car was connected with a customer. This was the basis of the customer ordered production strategy that Sören Gyll introduced in the early 1990s. The implications of the strategy were strong among the suppliers and in the Volvo manufacturing units because the uncertainty related to production capacity and input material was huge. Over the years the meaning of customer ordered production has changed and we will continue to explore the changed meaning of a customer order after an elaboration of the volume targets that have implications for the meaning.

COP assumptions

COP was decisive for Volvo Cars' way of doing business. The CEO's message was clear; customer ordered production was the only way to make profit. And compliance was total. The manufacturing manager stated "we have no idea what we shall produce this week". Also, the demands on the suppliers increased drastically: "You have to respond to our daily orders", which at first created chaos. This was in the 1990s, and COP was seen just as important or even more important than in the late 2000s because of increased demand uncertainty. Actually, also the after sales team implemented a system based on the same logic but applied to the distribution of spare parts. In the implementation phase of the customer order based distribution of spare parts a dealer unexpectedly said, "*We are now talking about customer orientation and spare parts while I have 100 cars at the yard*". The comparison was an attempt to direct attention to COP and question why they should invest in the new spare part system if COP was losing in importance. The cost of a spare part, related to a car, might be one to thousand but cost savings and increased customer service were as important in the after-sales process as they were in the new car sales process. Nonetheless, the argument related to a drastic change in the practice of COP. Cars were produced without customer orders, despite the COP strategy.

As to Volvo Cars' evaluations of performance, a high BTO rate correlated with stock level (see Figure 6.2).

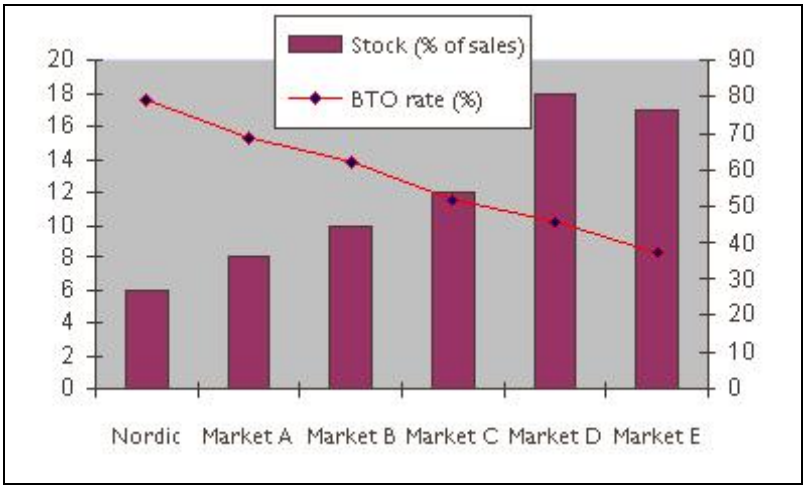


Figure 6.2 Correlation between BTO rate and performance. Source: Christer Nilsson, MP&L, Volvo Cars, 2006/2007.

The COP strategy implied important changes for Volvo Cars in reduction of lead times and in building only customer ordered cars with high quality. These premises were interdependent; without shorter lead time the delivery time was unacceptably long for customers waiting for their cars. And, without the pull logic of a customer order triggering the car production, inventories along the supply chain would increase the lead time and stock cars would reduce the premium quality of a new car. Also, without reliable quality, tests along the supply chain would prolong the lead time and delivery times would be unacceptable. The importance of these premises was not questioned in Volvo Cars' discourse, but over time also other initiatives have strategic importance. Nic Bähler, responsible for business strategy in Human Resources, argued in 2004:

> "The Volvo Cars corporate philosophy has always been the basis of the way we do business – and that will remain unchanged. Our present philosophy was formulated in the mid 1990s and is still our guideline. But a great deal has happened since then, particularly the fact that we are now owned by Ford Motor Company. This has prompted company management to initiate 'The Volvo Cars Way' to refine and revitalise the meaning of the corporate philosophy."

The complexity and associated costs related to the production of cars enforced production as the basis of a dominating industrial logic in the automotive industry. Overcapacity in the industry means that this logic does not necessarily

lead to profitable results. Traditionally, the role of the sales force has been to sell the manufactured products. However, their role was intentionally changed from conducting a car transaction to being a party in a relationship. For the COP, dealers were asked to participate in making Volvo more customer-oriented, and customers were involved in product development to improve concepts that were enacted in the development. The preferences learned from customers and dealers were important for the development of cars. Since the 1990s, the product program has been extended and many new models have been developed with increased content and with an exclusive premium car image but neither profit nor volumes have followed the trend. The plan to sell premium cars at premium outlets where dealers were parts in relationships with customers was vulnerable and easily affected by upcoming dilemmas.

The dilemma of volume or customer orientation

Marketing was challenged by top management to increase volumes of sales. Basically, an aim in the mid 1990s was to attract additional customers by a expanded product program and thereby increase sales volumes. From that followed a focus on customer orientation with innovative features and design that customers were willing to pay for. At the same time costs and time involved in the development process had to decrease (Volvo made budget reductions every year) – it was a matter of customers *and costs*.

In 2000 the target of the marketing organisation for the coming years was seen as unrealistic, an increase from 400,000 to 600,000 cars by 2005. At that time, profits were good and the product program was promising. Top management wanted to increase sales volumes, and the marketing function asserted the importance of their customer-focused sales model. As increased volumes were decided upon, it was up to the marketing organisation to solve the dilemma of how to compromise between volume and customer focus. The functions of the marketing organisation interacted a great deal but lacked the collaboration and working methods applied by, for example, the module teams. However, the circumstances differed. While the organisation of the module teams derived from their physical interdependencies and a need to coordinate, the marketing functions were less complex in terms of physical interdependencies related to the product. Marketing activities and resources might be combined in more ways, which increased the uncertainty of who should be involved, what should be discussed and how a solution should be evaluated. Cross-functional working was tried, but the frustration grew about how to proceed and combine ideas and targets. The working methods implied a great deal of interaction but less results.

Basically, a car was a commodity that needed conceptualisation regarding car ownership, which demanded more than ideas from diverse interactions. Services such as insurance, financing, service agreements and roadside assistance had become commonplace. Premium brand objectives of renewal, volume and profit were seen as possible with new work procedures and an acceptance of a business logic rather than an industrial logic (attributed to the production system). So, in 2001 the uncertainty of how to work and what priorities should be made was dealt with by local interpretations and translation of the goals. The main controversies acknowledged by the marketing organisation were market versus production operations, long-term versus short-term view and production-based versus marketing-based logic. A production-based logic was seen to dominate top management, in which "old" working procedures prevented new objectives. The operative view of controversies related to what the functions were accountable for – production was accountable for efficiency and quality while marketing was responsible for sales and market opportunities. The long-term versus short-term view related to the fact that, on the one hand, the finance and production departments favoured a short-term perspective and the current productivity level. On the other hand, the output of the marketing and product development departments was normally assessed over years. The underlying production logic was seen to be prevalent in the marketing organisation. Basically, a sales organisation for the car as a commodity with mass production delivered a different offer to their customers from that of a sales organisation that focuses on services and experience, of which the car was only one part. Top management was accused of misunderstanding the meaning of what was needed to reach the new objectives and not seeing that the current working procedures and day-to-day practices of the marketing organisation were outdated.

At this point, manufacturing had invested in flexibility and demonstrated an ability to produce to customer orders. Sales were good and an objective of volume growth might be seen as natural. By 2005, the sales were less than 450,000 cars and the goal was redirected to 2009.

In 2007, Gerry Keaney, senior vice president of marketing, sales and customer service was convinced that the target of selling 600,000 cars annually could be achieved. "*We can increase our potential dramatically by developing the same type of flexible platform for small cars as we have for our many bigger models*", and he declared:

> "We can grow by offering a varied range of small cars. We can also expand geographically by targeting growth markets in China and the nations of Eastern Europe – such as Russia, where we are already experiencing strong growth. We also have the potential for significant expansion in southern Europe. Our range of engines and drivelines also offers opportunities for growth, especially in the diesel and bi-fuel segments. We must also exploit our membership of Ford's PAG

> (Premier Automotive Group), as well as the benefits of scale available to us as part of the Ford Motor Company. We have set ourselves a tough target – to increase our annual production in a controlled manner to 600,000 cars and to do so while maintaining profitability. In a time of recession or when the dollar is weak, causing a decline in profits in North America, our job is to keep our costs in check. There will always be currency fluctuations. Volvo has dealt with those before and will do so again!"

The focus on volume had some unintended consequences. To the market organisation the volume objective meant that sales had to be pushed. Still, the order process was organised for customer ordered cars, because the working routines were the same and the costly manufacturing flexibility rather increased dealer value than customer value, as it became a part of a bonus game in the ordering process.

The volume growth objective was problematic for those in the organisation who were responsible for volume-related issues, product planning issues and short-term volume optimisation. The metrics per se were simple, they were a part of a plan initiated in 2000, and the number of cars sold related to resource investment plans as well as to bonus systems for people. The objective was emphasised and adhered to by the CEO and the parent company. Both growth and customer satisfaction were important parts of the corporate strategy. The volume target of 600,000 cars was backed up by investments that boosted the break-even volume of the company but very little happened to the volumes. A consequence was that accounting periods became more important than customers' satisfaction, because those deadlines were important for reports on efficiency and for bonuses. The volume target affected the organisation, especially towards the end of the year, as short-term profitability determined the planning of volumes.

Dealers' forecasts and orders deviated from the volume targets that were cascaded down through the organisation, and people had to push sales and speculate with stock cars, changed in the last minute to a specification with as low risk as possible, which gave bonus payments. The cascaded volumes included the number of cars sold, variants and key components. In a COP supply chain, this information was important to manufacturing and the whole supply base, because it governed investments, efficiency and ability to deliver. Thus, the volume targets created frustration and cynicism along the whole chain, from dealers to suppliers. Volumes and variants of specific cars were imposed on the sales organisation, those responsible for volumes could not make sense of their targets, and the supply side was misinformed and had to rely on expensive last-minute changes. The order-to-delivery process was forced away from the customer model.

The way different objectives affected each other was related to politics in that the agenda for these might weaken or strengthen other objectives around.

Also, it was a question of which projects should be concentrated on and by which resources.

The dilemma of approving projects

The automotive industry has often been often characterised by its ongoing internal and external projects. These were eclectic in the sense that they were sometimes initiated by a problem and sometimes by a solution. The project groups vary; they might be functional or organisational groups or they might be groups of organisations.

Supply chain monitoring was a cooperative project with the aim to develop the concept of monitoring supply and demand in supply chains. It started in the early 2000s as an industry-wide project that involved major European automotive suppliers, Audi, BMW, DaimlerChrysler, Ford, GM, PSA, Renault, Volvo and Volkswagen, and automotive organisations, among them Odette. Representatives met regularly and decided on the content and meaning of the concept. Some OEMs rolled out a monitoring solution based on the common concept together with a limited set of suppliers and a software developer. Representatives of Volvo Cars, AB Volvo, Scania, FKG and Odette Sweden[4] decided to launch a Swedish initiative based on the common development so far. Then the project changed shape from a solution to a problem – how to go about for support for the endeavour.

As a first step, the members of the Swedish project presented the concept to other influential actors in the Swedish automotive industry and invited me and my research colleagues to take part. The project was exciting as it attempted to integrate the supply network in an information structure and facilitate information sharing of supply and demand in the order fulfilment process. Such transparency in the supply chain was widely discussed in logistics literature with the aim of solving root causes of excessive inventories and stock-out situations. The car manufacturers' objective was to promote suppliers' efficiency and effectiveness, and to develop their build-to-order strategy by securing supply with minimum safety inventories. Over a couple of years the supply chain monitoring project developed. First, a study was made of the monitoring projects of the other OEMs, who willingly shared their experiences as colleagues, despite their belonging to different competing firms. Then, those involved attempted to start a pilot project. In different meeting arenas the monitoring concept was explained and promoted. Emphatically, all parties agreed that the solution would be beneficial. Volvo Cars and other Swedish automotive OEMs saw it as valuable for building cars to order with the help of fast, flexible and reliable supply networks. The suppliers' value related to

[44] Odette and FKG are industry associations that act for the industry, create meeting arenas and initiate activities to strengthen industry competence.

accurate demand information. Well-known operational problems such as high stock levels, extra freight costs, frequent stock-out situations and major administrative efforts to manage supply were involved in Volvo Cars' business case for a pilot study. A business case was an evaluation of benefits and costs related to an investment, such as supply chain monitoring. A potential implementation of this project was evaluated in relation to other Volvo projects. In Volvo Cars the project was prioritised and widely discussed as a future option. However, this project competed with other projects and fell short and there were no funds for a pilot study. At the time of the decision process there was a strong focus on cost, and few development projects were funded. The suppliers played a minor role in the planned project. They were asked to participate because their supply was problematic and they were asked to do so without any major financial investments. Nonetheless they hesitated. Financial investments were one side but other resources were also difficult to obtain for participation.

That particular project never took off and the implementation was postponed. This was unexpected. But the suppliers were already taking part in several different development projects with the car manufacturer and found it difficult to bring in resources for another. The car manufacturer could hardly finance the whole project and therefore resources became problematic. Investment costs were difficult to get approved within the car manufacturer organisation and this time the investment proposal was turned down. However, the belief in the idea as well as the need for it remained and supply chain monitoring was later resumed. Problems with the idea were, among others, that the returns of the project were difficult to distribute and estimate per function and per firm. Sharing information about supply and demand in the supply chain facilitated logistics performance if new logistics procedures were agreed upon. However, the car manufacturer's purchasers were expected to take advantage of a potential increase in performance attained by suppliers in coming negotiations. The main objectives of the negotiations were to lower the price, and if the cost structure in logistics had changed, then the prices would have gone down and made the implementation a zero-sum game for the supplier. The car manufacturer's strategic logistics development function and purchasing function did not make sense of this together. Transparency was translated differently in operations and in business negotiations. The way projects like this were approved had changed because of costs, and further experimentation with the idea was not on the agenda.

The closing of the project might be seen as an indicator of the restricted possibilities to get momentum for integration of the business network. More integration facilitates the build-to-order strategy, which was the formal strategy. However, more integration because of transparency was also seen as suspicious. The belief in the idea persisted and later a pilot was launched to monitor internal flows instead. In the case of the stopped project, internal relations, such as interactions between the logistics function, the purchasing function and

management by objectives were more difficult than interactions and negotiations with the suppliers. The difficulties became a barrier to progress. A later pilot was launched to monitor internal flows instead. The project turned out to increase transparency in supply and mitigate the effects of dynamics created in customer/dealer orders. However, in the present situation of costs reduction and volume growth objectives it was not used in the COP development.

The meaning of COP strategy in the introduction and over time

Lars-Håkan Wilhelmsson, acting head of purchasing, stated in a report on corporate citizenship for the Volvo Car Corporation in 2000:

> "Ten years ago, we initiated a process – which is still ongoing – to reduce our supplier corps to a smaller number of relatively large companies. This has been accompanied by a process of structural change in the supplier sector involving various takeovers and mergers. At present, suppliers produce about 75 percent of the value of a new Volvo. Their activities were just as important to us as our own, and component development is now a cooperative process involving design engineers on both sides. Like ours, a supplier's production is customer order driven. This means that the customer's order determines what the supplier is to deliver – and when. We employ common data systems and quality monitoring programmes."

The meaning of COP changed since the initiation and since Wilhelmsson's statement. First, the order-to-delivery process development will be illustrated. Then, the changed use of forecasts in this process will be illustrated, followed by an interpretation of changes in customer satisfaction. Finally, the strategic material planning and logistics situation and development will be discussed.

The order-to-delivery process

The strategic change project of 100 per cent COP focused on achieving customer orientation, delivery precision and lead time reduction. A problem with the order-to-delivery process was that people involved felt that orders were dropped into a black hole and popped out six to twelve weeks after the sale. Customer surveys had shown that six weeks was the upper limit of acceptable delivery time. Reduction in lead time seemed to be important for the market success of COP. Therefore, 28 days from order to delivery was the goal with a deadline in 1994. In 1992, Volvo started the practice of production based on customer orders and in 1993, COP became a policy in the whole of Europe.

There was a huge difference between forecast-based and order-based production. Particularly in attitudes within Volvo, the production perspective had to focus on orders from customers. When the 28 days' lead time target had been largely achieved, it was decided that the lead time should be reduced by 50 %, as is shown in Figure 6.3.

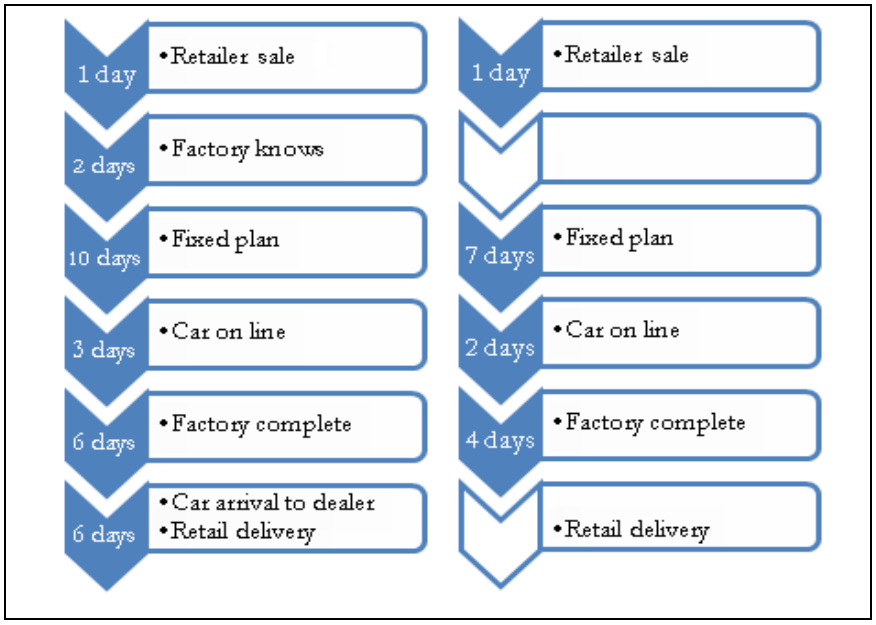


Figure 6.3 An order fulfilment process of 28 days vs. 14 days. Source: Adapted from Hertz (1999).

The lead time reduction to 14 days implied changes for organisations as well as relationships to others. In a study by Hertz (1999) the actors affected were especially the former head office, Volvo Cars, including Volvo Car Manufacturing, Volvo Transport, transport companies, suppliers, Volvo sales companies and dealers. The reduction enabled COP of all cars, except showroom cars. The factory delivered the car directly to the dealer. The dealer's role changed from pushing sales to guiding customers among the options in the assortment. In the sales, the dealer demonstrated showroom cars to the customer rather than pushing cars from the parking lot. Actually, there were no cars in the European dealers' backyards; all sales had to be ordered. The relationship between dealer and customer was changed. With a minimum of stocks the need for clearance sales diminished. Instead of discounts, sales were based on finding the right offer that could be extended to after-sales business after the transaction. Customer satisfaction increased as sales could react more quickly to the market with a need of less tied-up capital. Thus, the lead time reduction implied a customer oriented business model.

Before the reduced lead time, the car manufacturer had its focus on the production and the design of cars. Its focal interests were efficient and high-quality production, shortening of product development cycle times, reducing staff turnover, etc. The 6-12 weeks of delivery time was not very strange. Head Office controlled and made plans to facilitate a smooth and efficient production in its production units. Volvo Cars collaborated, sometimes forcefully, with suppliers for low prices, agreeing on quality as well as delivery on a promised day. Volvo Transport was then a fully-owned Volvo subsidiary that organised high-quality worldwide transport flows at low prices by negotiating with external transport companies about performing the physical transports. First production was optimised and then sales were pushed. Sales companies sold cars to dealers, kept cars in stock and made adaptations in line with customer requirements. In addition, the sales companies were responsible for the dealer network, audited the dealers' financials and carried out marketing research and promotion. Sales companies negotiated with the dealers in order to get them to take on as many cars as possible and to that end, prices and discounts were an important tool. Their forecasts of the market development determined the car production in terms of volumes and type of cars. Also, the dealers, who sold cars to business customers and private customers, had a stock and offered service, maintenance and customer adaption such as instalments of stereos. Some dealers were small with small facilities, others had many outlets. The capital-demanding stocks of finished cars needed regular reconditioning, which was a costly task for the sales company as well as for the dealer.

Over time, 14 days turned out to be an unnecessary short lead time based on customer reactions and dealer discussions. Delivery precision was seen as more important. Customer ordered cars dominated in Europe, while production had to be forecast based on demand in Japan and the USA because of the long delivery time. Over time, the US market has become very important.

In 1997, the customer-oriented strategy was facilitated by a reorganisation that enforced three business processes, the order-to-delivery process, a product development process and a market and sales process. In addition, the information system opened up for transparency of order status, which, for example, gave dealers a possibility to add or withdraw options based on customers' changed minds. Organising along processes demanded considerable person-to-person interaction. A problem with the process management was that the cross-functional processes were evaluated by process outcomes that were key performance indicators. At the same time, the functions that participated in the processes were evaluated in the organisational report system. This ambiguity of performance criteria created conflicts.

The order-to-delivery process takes off when a dealer registers a sale; this involves planning of assembly orders and orders to suppliers, transports, assembly and delivery to dealer and ends with the delivery to customer. Many actors were involved and influenced the order-to-delivery process directly or

indirectly. All interdependencies made the process complex and dependent on, among other things, purchasing agreements' fit to needs, suppliers' production processes, transporters and traffic, the assembly process and customer specifications. Coordination was crucial to ensure a functioning order-to-delivery process, and the radical change of it had profound consequences in business relationships. At the outset the customer was the origin of the coordination. The Volvo policy of only producing cars that had been sold means that customers had to wait for their car but also that the car was fully adapted to their requirements and choices. The customer-order approach called for different marketing but also for different operational strategies.

Use of forecasts

Basically, a whole car was too complex to produce to customer order. Many parts needed to be produced in advance while at least assembly might be postponed until the customer order arrived. In the speculation of what parts to produce and what kind of capacity was needed for production, good sales forecasts and supply planning systems were needed to prepare the customer ordered production. The forecasts were broken down into production planning processes of material and capacity and into purchasing and procurement processes. Continually, the ordered mix of cars replaced the forecast orders. These customer orders initiated the postponed production. One hundred per cent customer ordered production meant that there were no assembly activities unless a customer had defined and purchased a car. Some markets were excepted but seen as a whole the rule was agreed upon. The target of customer ordered production was 80 per cent at the European market and 20 per cent at the US market. Therefore, it was quite surprising to learn that in the late 2000s dealers were worried about the stock they were not supposed to carry. People responsible for selling cars were of the opinion that fundamentally customer ordered production was the rule but what were originally exceptions of forecast-based production were almost becoming a rule. The content of a customer order had changed in meaning.

In the late 1990s forecasts replaced orders on markets with long transport time and in the 2000s forecasts replaced customer orders also on nearby markets because of volume challenges, bonuses and a reinterpretation of COP. The potential of customer ordered production was in place but the order system was used in a way that, at least partly, substituted the customer as a trigger with bonus classes. In the production system, the role of the order was the same, whether it was a forecast order or a customer order. The reinterpretation of COP was that sales might push cars to customers by offering entertainment in the sales situation, such as ice cream and balloons, and a special offer.

The push logic belonged to the history of how cars were to be sold and manufactured. Before the lead time change and the introduction of COP in the

early 1990s, stock cars of sales companies needed to be sold with priority because of high capital costs and reconditioning costs. The sales company offered different types of discounts to promote dealers to take on the cars in stock. Standardised cars could be adapted to specific customer requirements. Consequently, dealers' sales focused on what was in stock and the marketing of the whole assortment as well as sales of new models were restricted. Dealers focused on the stock and adapted the offer to profit by internal incentives rather than the whole potential of customers. The dealers and the sales companies used a traditional push sales strategy.

Customer satisfaction

In 2002, customer satisfaction was commented on by Hans-Olov Olsson, President and CEO of Volvo Cars in the following way:

> "To Volvo Cars, quality is synonymous with satisfied customers. This requires that the customer's entire experience of our brand – car, sales personnel, ownership and service – is first class. Volvo customers also expect the company to contribute to sustainable development. Our aim is to become No. 1 in customer satisfaction by 2004."

In Volvo Cars' sustainability reports, customer satisfaction was estimated by J. D. Power and Associates[5] (www.jdpower.com) supplementing a synthesis of independent surveys of customer satisfaction, in which Volvo was ranked among the top three car brands. The survey included the J. D. Power sales satisfaction index, customer service index, initial quality study and vehicle dependability study. The sales satisfaction index measured dealer performance after three months of ownership; the customer service index measured service and repair quality after three years of ownership; the initial quality study measured experienced design-related problems and defects and malfunctions per hundred of cars after three months of ownership; and the vehicle dependability study measured reliability of cars after three years of ownership. The initial quality study, which Volvo characterised as being among the most influential in the North American market, showed that Volvo slipped from fifth place in 2002 to eleventh place in 2003, to fourteenth place of all brands in 2004 and further to about thirtieth place in 2005. The European customer satisfaction was better. In the customer satisfaction top three ranking from 2002 to 2005 Volvo slipped from 15 per cent to 12, then up to 17 in 2004 and remained at that level in 2005, then declined in 2007. The surveys were based on customer experiences and were evaluated in comparison with other brands.

[5] J. D. Power and Associates is a global marketing information company that is best known for its surveys in the automotive industry about customer satisfaction, product quality and buyer behaviour; it was considered by Volvo to be influential on the American market.

Experiences of malfunctions were dealt with within a short time. Other experiences related preferred use situations and expectations, for example, customers who wanted to adjust the audio and climate experienced the needed control operations as too complicated and, furthermore, functions that competing brands offered were expected and, thereby, decreased the experience of Volvo's brand.

In the early 2000s, top management argued with the marketing function and the sales companies about the urgent need of volume growth. Sales forecasts then became based on top management challenges rather than on dealer insights. Then, bonus systems stimulated dealers to push sales. Dealers attracted customers with specially reduced prices in order to achieve the targets. Most customers were happy to pay less for a car waiting in the yard but the changed procedure altered the sales process and affected customer satisfaction. The sales process of customer ordered production included an important interaction with consequences for customers' satisfaction. J. D. Power's sales satisfaction index surveys the new-car sales process evaluated by its negotiation, dealership facility, salesperson, paperwork process and delivery process.

Buying a new car was for most customers exciting and stressful. J. D. Power reported in 1996 that buying a car was often the second most expensive purchase after buying a home. Furthermore, many customers rated a dental appointment as more enjoyable than a visit to a car dealer. Thus, Volvo timely introduced COP.

Studies by J. D. Power in 2007/2008 showed similar patterns. Most customers hated negotiating prices with dealers, and some felt they had been cheated. Price was perceived in relation to other fundamentals. For example, the more attentive the sales person was, the less was the likelihood that the price or any product reasons would prevent a purchase. However, if discounts were the practice, the customers would expect to get a discount during the negotiation process and a failure to offer a discount resulted in a lost sale in more than 80 per cent of negotiations, according to J. D. Power. Hassle-free negotiations were important to customers. Thus, extended use of discounts seems to reduce customer satisfaction especially for premium car buyers. Value was quite another matter. J. D. Power and Associates also report that among car buyers (volume and premium cars), 40 per cent cite price as the most influential reason for turning down an offer. Of these, however, 40 per cent can afford the car but do not believe the car is worth the price. So, if a customer appreciates attentive negotiations and value, then the customer-based approach of pulling sales rather than pushing sales to customers is likely to satisfy customers and teach them what possibilities an advanced assortment might offer. In addition, a majority of car buyers use the internet to learn about price, models and dealerships. However, the possibility to attract the individual customer and draw on different values in the offers was situated in the interaction and significant for customers' satisfaction and, in turn, after-sales business.

The delivery process was another crucial part of sales satisfaction. In general, the new car customer was willing to wait 6-8 weeks for a new car, and especially premium car customers tended to accept longer delivery times. After the change to customer ordered production, the dealers could deliver a car in line with expectations and keep track of the status of the order during the delivery time. The change in sales procedure during the 2000s meant that once again cars were offered from the stock at a discounted price, which was likely to reduce the propensity to order a car based on customer specifications and pay more. The discounted cars limited the market for the whole range of the assortment because the risk was less with a stock of standard cars for a segment of customers. Simultaneously, huge sums were invested in product development to attract various types of requests from customers. The overall satisfaction with the sales process was significantly affected by not finding a car with the exact features desired. Customers react to the fact that they have to pay for features that they do not necessarily want rather than reacting to getting some features for free. J. D. Power and Associates argue that these customers shop around to match a car to their requirements rather than relying on the sales person. For Volvo, the growth of their customers' satisfaction seemed to be stable in 2005-2008 but was declining in comparison with the industry. Although still ranking above industry average, Volvo fell back from eighth in rank to sixteenth.

Strategic material planning and logistics

Consequently, volume targets and bonus systems were important to dealers and generated situated volume growth rules to make the most of opportunities. Dealers speculated about the sales within the bonus period and ordered cars based on that rather than actual demand. The production could not separate a customer order from a dealer order. The order-to-delivery process treated all orders as induced by a customer. Customer orders were allowed to be changed despite implications in production and in the supply planning before the production started, in order to facilitate customer responsiveness. The dealer should be able to change an order on request from the customer until the fixed plan had been implemented. Therefore, also dealer orders could be changed to match or at least satisfy some of a customer's demands.

A fixed plan meant that orders were placed into a production slot. This option was used by dealers who tricked the order-to-delivery procedures in order to minimise their risk of speculation. It meant that several orders were changed, which caused variability and uncertainty in the supply chain. The implications of this were increased costs for car production without achieving the overall objective of volume growth. In the mid 2000s, the management of Volvo's material planning and logistics, MP&L assessed that logistic processes were not prioritised enough within the company and that they suffered from poor schedule stability and delivery precision, a sub-optimisation of logistics

and production, which in turn had large stocks of material at the line. The assessment was based on a comparison in the industry, Best in Class, and the aim was to improve their position. The goal was to achieve schedule stability and optimise built-to-order demands, to put logistics processes in focus to secure precision and cost efficiency, to serve the operator in production based on logistics and to minimise material at the line and have a flexible material backing to support changes and deliver cars with a competitive lead time and high precision. Best in Class might be seen as a complement to build to order but also as a competing initiative. It was a kind of lean production project with ambitions of improving production performance in relation to those OEMs that were best in class. It has created frustration because of its focus on costs and concomitant reduced flexibility by the use of far-away suppliers, which in turn implies long lead times.

Perceived challenges establish themes over time. In the mid 2000s, the management of Volvo's material planning and logistics specified the themes of globalisation, environmental care, complexity, variant explosion, robust processes with the required flexibility maintained, transparent information, commonality and agility (lean and flexible). For these, different means of technology and competencies were exemplified as beneficial. For instance, supply chain monitoring was one example with inherent promises to increase robustness in processes, to make information transparent in the supply chain and to facilitate agility. Implementation of supply chain monitoring could not get enough resources, and in hindsight it seems fair to say that new monitoring practices threatened to bring conflicts to different supply chain relationships. The idea of supply chain monitoring was later tested involving a supplier owned by Ford with the Torslanda and Ghent plants acting as receivers. In this case the test was easier because the function of the concept could be tested without threatening the balance in supply chain relationships. In order to make use of technology such as supply chain monitoring and understand challenges, material planning and logistics management argued that logistics must become a proactive business partner for all disciplines in the company. They needed to create sense.

The introduction of COP led to increased importance of suppliers. And, these were challenged by logistics with short lead times, quality assurance, delivery precision and planned transports. This was something new in comparison with other automotive customers. In order to bring about common strategic development, such as product development and logistical development, the suppliers needed to work continuously with Volvo in change processes. Volvo wanted suppliers to voluntarily take part in the development. This meant that different initiatives competed with each other for recognition and resources in order to be powerful and gain legitimacy. For example, to decrease lead times associated with COP implementation, Volvo set demands and, if needed, worked with the suppliers to improve their ability in supplier development programmes. The follow-up of supply performance was

conducted pursuant to a plan. First, initial actions were carried out by plant managers; they analysed the situation, organised rush transports, had telephone conferences with the suppliers and invited them to the plant, in order to finally agree on an action plan. Then, if the performance did not improve, the central function for logistics was involved and decided together with purchasing how to develop the supplier by remaining at the supplier's until the problem was solved. The higher managerial level included the supplier's CEO deciding on an improvement plan. If no improvements were seen, the relationship was reviewed by purchasing and potentially phased out by commercial actions. The audit was for new potential suppliers or suppliers that constantly caused problems to Volvo Cars, and the self-assessment was verified by a follow-up visit at the site if needed.

The suppliers could not be forced, but incentives to take part were strong in terms of development and continued business relationship. Over the years, purchasing was concentrated to fewer suppliers, which on the one hand increased the suppliers' willingness to invest in projects but on the other hand limited options as it was difficult for a supplier to take part in many simultaneous projects. Taking part means more than yes or no, it was an evaluation of "what is in it for me/us?" and "how much, i.e., with what resources, do we need to take part?"

Process thinking was important for the development of COP. COP was initiated at a time of stagnation in sales and Volvo was running at a loss. The strategic change was preceded by implementation of cost-reducing reengineering projects that led to suboptimisation and a recognised need to consider higher-level processes. Initially five processes were used, but over the years three processes were, more or less, in use. The order-to-delivery process was basically the same; this affected the network of distributors and dealers as well as suppliers and transporters. The process includes meetings and a structure within the organisation. The offer-to-order process includes marketing and sales processes but seems, in practice, to have been left behind. It was not in active use; instead, those processes were dealt with by other means. The product development process has evolved and has gained increased importance in the organisation, in the relationship with suppliers, in the relationship with the owner and as an eye-opener regarding the role of the customers. The order-to-delivery process objectives were that it should be based on customer orders (20 per cent overseas and 80 per cent in Europe), on time and with an acceptable lead time.

Thus, in the mid 2000s, the objectives of COP were, accompanied by Best-in-Class ambitions and volume objectives, in between a locate-to-order (LTO) and a build-to-order (BTO) strategy. To be Best in Class, Volvo Cars would like to change their behaviour in order to focus on five prioritised Volvo Cars Manufacturing principles: "*In the centre is production. Production is our core business. To be Best-in-Class, we need to secure an efficient production by reducing costs and removing waste in our processes.*" Logistics facilitates Best in Class by delivering "*with precision*

according to plan". Leaders were urged to be present in order to coach and control. The objective in improvements was characterised: "*Right from me forward – don't pass on problems*". And the organisational principle should be to standardise work methods to reduce variability. The locate-to-order and build-to-order strategies were separated by order-to-delivery processes as shown in Figure 6.4. The LTO strategy had a focus on transportation cost, and supply chain performance was seen as important. The strategy was formulated in the phrase "*You can have the cars that we have and you can have them now*". Thus, the order-to-delivery process of LTO includes delivery of a car from inventory that is pre-produced on the basis of a forecast. The BTO strategy had a focus on overall supply chain cost, and supply chain performance was seen as crucial. The strategy was characterised by the statement "*You can have whatever car you want within a short lead time*". The order-to-delivery process of BTO includes delivery of parts from inventory that are pre-produced on the basis of a forecast and then assembled and delivered in accordance to a customer order.

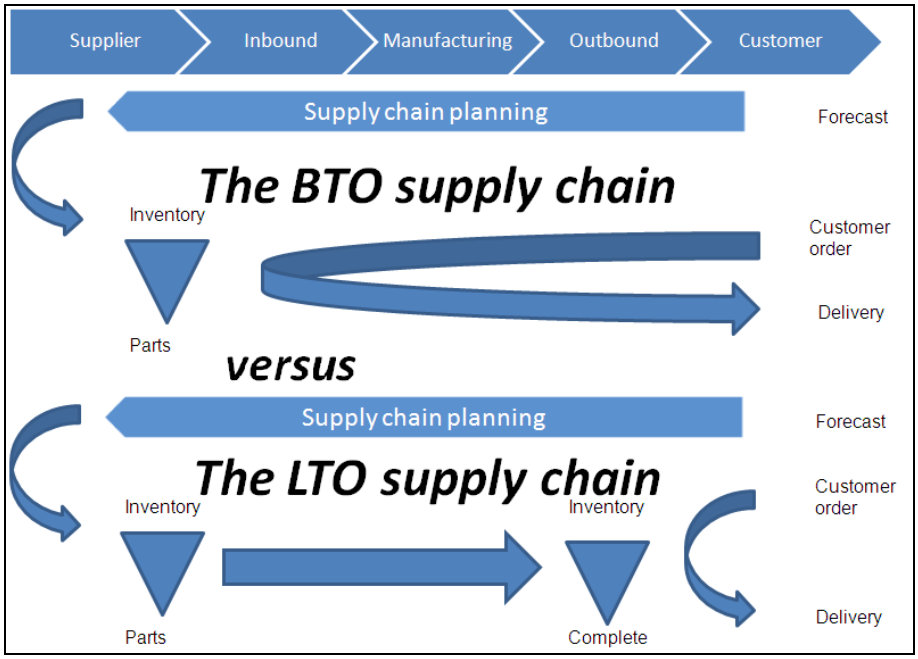


Figure 6.4 The build-to-order process versus the-locate-to order process. Source: adapted from presentation material, Johan Rådmark, Volvo Cars.

The demands on logistics by Best in Class could facilitate the build-to-order strategy as well as the Best-in-Class strategy. The problems that were identified related to poor schedule stability, logistic processes not prioritised enough within Volvo Cars, suboptimisation of logistics and production, large stocks of material at the line, fixed material façade, different solutions for packaging and

racks within European brands and poor delivery precision. The objectives of logistics to facilitate the Best-in-Class strategy were to improve schedule stability and optimise built-to-order demands, have logistic processes in focus to secure precision and cost efficiency, optimise logistics for the operator in production, minimise material at the line side to reduce waste, support changes by a flexible material façade, standardise solutions for packaging and racks in pan-European brands and deliver cars with competitive lead time and high precision. The objectives include COP rather than excluding the customer orientation. However, the salient point in Best in Class, "*to secure an efficient production by reducing costs and removing waste in our processes"*, was a warning flag for the marketing side that fewer changes due to customer orders would be accepted.

In 2003, Volvo had more than ten years' experience of COP but others in the industry were seen to move in the same direction. The newness of COP as a build-to-order strategy in relation to the strategies of other automotive actors was seen to be threatened. Those actors that applied a make-to-stock strategy changed towards a locate-to-order strategy, and those that applied a locate-to-order strategy changed towards a build-to-order strategy. The make-to-stock strategy was seen as the traditional approach, which was forecast-driven in order to optimise planning of production. High stock levels were accepted because the customer bought a car from stock with additional discounts and incentives. The locate-to-order strategy was based on the traditional approach but with an "open" pipeline, i.e., with an option to change order status. The build-to-order strategy was customer order driven, i.e., a customer ordered a car according to specifications and therefore great material flexibility was needed in order to maintain low stock levels. The build-to-order strategy was seen to give better profit margin; especially the stock level as a percentage of sales was low at markets with a high rate of build-to-order cars. How others in the industry had moved in the same direction will be discussed next.

Build to order as seen by other automotive manufacturers

Automotive News reported in several articles about the build-to-order development. Actually, in the early 2000s most automakers had pursued build-to-order pilots. But, as I will illustrate in this section, inspired by the trade journal articles, these were very different in scope and in depth of development.

Mitsubishi's Colt was the first in the small car segment that was claimed to be built to order. In 2002, in addition to accessories such as cup holders, the customers could choose options that included engine size, wheel type and seat shape, which resulted in a huge number of combinations that might be ordered without any extra cost or time lag. Mitsubishi planned to adopt this build-to-

order system for all future models. The build-to-order ideas were developed from the order-to-delivery distribution system of 2001, when Mitsubishi decided about a turnaround in the USA. They stopped ordering cars on behalf of their customers and dealers and reversed the process so that the dealers had to pull cars through the system. By that, the sales company was free to build and market the brand rather than wholesale cars that were misordered. The handover of order responsibility to dealers meant that dealers could adapt to their customers but also that they had to take on higher risks in case the market demand changed over the 90 days they had to forecast. Also, a 3DayCar Programme included, in the early 2000s, the automakers Ford, Honda, Nissan, Peugeot, GM's Vauxhall unit and Volkswagen with the aim of researching and developing the order-to-delivery process. The three-day period refers to the time it would take to order, build and deliver a car to a customer, and the programme aimed to identify problems and potential solutions. One lesson from the programme was that the three-day period was unnecessarily short, which meant that the production system and the suppliers were put under too much pressure. Also Renault withdrew from their 15-day order-to-delivery target in 2002 because of problems with supply, logistics and distribution.

Despite the fact that many automakers have pursued build-to-order pilots, only some have integrated changes into the way they do business. The automotive talk about revolutionary short lead time, in terms of a five- or three-day car subsided in the mid 2000s and the focus was set on the supply chains, shipping and the methods used to track products in the supply chain and especially in the automaker plants. Ford's director of global customer order fulfilment and product scheduling, Adriana Karaboutis, said in 2002 that BTO was "*now in the nitty-gritty of logistics, manufacturing and supply chain management. You can put configuration systems out on the Web and have customers playing and dancing with them. But the reality is, until you get the back-end operations going, it's all a big hype*" and "*That's what we're going after now.*"

Volkswagen's sales were based on a combination of customer ordered cars and car-importer ordered cars. In Norway, for example, the importer, dealers and the manufacturer meet to decide a sales quota for the next year based on market shares. The proportion varies, but in 2004 the customer ordered cars were about 50 per cent, rising to 70 per cent in 2006. However, here the customer was either the dealer or the dealer's customer! The manufacturer treated these as confirmed orders and the speculative risk was beyond their sight. Dealer orders were speculative but on the dealer's risk and therefore the manufacturer perceived themselves to build to order. Still, there was a large degree of speculation. First, the sales quotas were decided on in terms of models. Then, a part of these became customer ordered so that either the customer or the dealer would configure these with motor, transmission, interior and exterior. If there was a residual between the customer ordered cars and the quota, then the importer had to speculate about the configuration. The importer based the speculation on general market knowledge and risk

minimisation in terms of a few or a standard number of extras that might be bundled and discounted to promote sales. In addition to this, the manufacturer seemed to add to the number of speculation-built cars by having a country-based batch production. The customers were allowed to pick and modify an in-production car up to two weeks prior to delivery. Normally, the order-to-delivery time was six weeks. The modification drew on a fixed model with features while smaller features were flexible. Volkswagens' annual report in 2008 stated: "*In the future, the ability to produce several models on a single production line will become a critical success factor."* But the objective of efficiency was seen as overriding and by continuous improvement Volkswagen aims to increase efficiency by ten per cent a year. Consequently, build to order was related to late customisation at the factory, at an intermediary such as the importer, a third-party logistics firm or the local dealer in order to minimise production complexity and related costs.

BMW executives believe that built to order wins brand loyalty. BMW's plants were developed as they introduced new models; for example, in 2009 the Spartanburg plant's production layout for X3 drew on that of the Leipzig plant. BMW started to produce different models (X's and Z's) at the same line in 2005. Now, BMW will let a customer change their mind on an X3 factory order as the vehicle moves from order to delivery. Richard Morris, vice president of assembly, declares, "*Build-to-order is who we are. We embrace that. But it's the mastery of complexity that we're after here.*" The complexity in production was in assembling different models on the same line. In 2001, BMW's built-to-order program aimed to cut delivery time for customer ordered cars in Europe from 30 to 12 days, which was close to their long-term goal of 10 days. BMW started building to order in 2000; they used an online ordering program connected to their factories to enable dealers to link prospective customer orders with an existing painted body.

Production complexity is a common problem and so seems the geographical closeness to be. Toyota's Scion tries to quickly give customers what they want by car configuration online with factory- and dealer-installed equipment. Model, exterior colour, transmission, accessories, audio and wheels are customer choices that are taken to a dealer who tries to recreate the car from inventory. And this seems to be what most automakers do. In 2008, Scion was made as single-specification cars in Japan; the only variations were paint colour and transmission. Japan was too far away for built to order, as the customers were unwilling to wait for months for a car. Scion's Vice President Jack Hollis claimed, "*Scion is a step forward toward assisting the 'build to order' concept within the framework of port pooling and accessorization*". The initial plan was to configure cars at a regional port. More than 100 port-installed accessories might be selected. Close to the port was a special assembly line. But the dealer preferred to have the car in-house or from a nearby dealer and configured it and added accessories. The configuration tool was also used by the dealers in the sales process to explore options with the customer and sell more. The dealer states,

"*They get what they want, rather than what you have. The customers do a pretty good job of selling accessories to themselves.*" The car configuration seems to be an extension of order-to-delivery distribution that also other automakers applied in the early 2000s such as, for example, Honda's factory distribution centres, where dealers could swap vehicles among each other.

As soon as a Nissan customer in Japan orders a car at the dealer's, the production schedule is sent to suppliers, engine and vehicle assembly plants, component logistics companies and vehicle delivery companies. This seems to be a process similar to the COP of Volvo Cars. Nissan's order-to-delivery target was 14 days and, in 2005, the order-to-delivery took 22 days. In, for example, the United States their order-to-delivery time was different, and Nissan's manager states, "*We cannot make apples-to-apples comparisons because of differences in our distribution network.*"

These examples illustrate some of the attitudes to the build-to-order concept in the industry. Competition has increased over time to involve more customisation, both because competitors have started to offer customer ordered production and because many competitors were complementing (customising) their cars by upgrading standardised cars. Short lead time and responsiveness are examples of improved effectiveness in a build-to-order process, while geographical distance, existing facilities and working methods are examples of hurdles. Thus, the scope and depth of build to order varies among actors' initiatives. The way a concept is performed shapes its content and effects. People at Volvo Cars were debating and were worried about the development of their build-to-order strategy towards a locate-to-order strategy. Any change might affect the performance of activities in the order-to-delivery process.

Attention by other automotive manufacturers to build to order made up an automotive discourse that indirectly influenced Volvo Cars' COP. In an era where other objectives were pushed by top management, by specialists, etc., the belief in COP as the Volvo way was persistent. Despite the decline in numbers of cars produced for a waiting customer, the COP was discussed as Volvo-ish. The discourse related to continued belief and efforts. Volvo Cars has a strategic freedom to change the degree of customisation because complexity of COP is managed. Under the circumstances the degree of customisation decreased incrementally and there was only sporadic evaluation of subsequent challenges. Next, the processes that were introduced in Figure 6.1 and discussed in this chapter will be evaluated in relation to COP development.

Ongoing processes encountering each other

In this chapter, I account for strategic development related to COP. It is based on encounters with those involved and secondary material, described in Appendix 1. The material relates to the introduction and development of COP,

not as *the* process but as a development among others that influence and are influenced by COP. The processual development has an impact on current COP in use, which will be illustrated in the next chapter. Thus, COP development might be seen from a processual viewpoint as in the following but also related to the meaning of the development based on different actors' COP in use.

COP changed in its performance from a prerequisite to accomplishing customer orientation to a problem for volume increase and cost savings. Figure 6.1, at the beginning of this chapter, illustrates ongoing processes encountering each other. In an attempt to reconcile and evaluate what I have seen in terms of change processes and patterns, COP is summarised in relation to its assumptions (Table 6.1), customer orientation (Table 6.2), volume orientation (Table 6.3), platform/product strategy (Table 6.4), projects and teamwork (Table 6.5), and cost-effective goals (Table 6.6).

It is worthwhile to understand both facilitators and impediments in a process, because these are in dynamic action and interaction. Table 6.1 is more or less a categorisation of COP assumptions understood from the case description. COP seen in relation to its assumptions (Table 6.1) is a way to understand what was driving and what was problematic to the development. Assumptions that facilitated COP development were that complexity related to increased responsiveness was possible to manage and would give advantages of *costs and customer orientation*. And, coordination with customers and suppliers reduces costs of uncertainties. For example, short lead time saves costs for tied-up capital. Responsiveness is related to such costs in that it eliminates stocks downstream in the supply chain. So is quality that was an uncertainty but became a prerequisite in the reduction of lead time and delivery time. Customer service is through creation and fulfilment of customer wants without the accompanied risk of car stocks (but rather trust in the offer and showrooms).

The responsiveness also made higher income streams possible as the customers were seen to do a good job selling a more expensive car if they were allowed to decide themselves about features. Coordination with customers and suppliers also comes from the thrill of working with creative concepts and solutions. The same assumptions also impeded COP development. Complexity is managed operationally, but another dimension of complexity is from the outside of the supply chain such as diverging objectives. Such complexity was handled in an incremental and informal way that had diverse effects on efficiency and effectiveness. Managing dependencies of demand and supply in a static configuration is thus not enough over time because change will occur. There is a high degree of professionalism in the management of complexity, and a lack of consistency (because of changes in objectives) affected dependent parties and led to dissatisfaction with, for example, costs of excess capacity. Also, extended delivery time resulted from informal adjustments of COP. An institutional belief that connects the automobile industry to mass production

and economies of scale is a "natural" knowledge base for decisions. In situational dilemmas over time this knowledge influences decisions.

Table 6.1 COP assumptions encountering COP development

	COP
COP assumptions that facilitated COP development	Customer responsiveness and responsive supply based on short lead time will reduce costs. Premium brand. Complexity is manageable by close coordination with customers and suppliers, which reduces costs and lead time.
COP assumptions that impeded COP development	Only operational complexity is managed; additional dynamics demands coordination that is difficult to prepare. The industrial logic.

Next, Table 6.2 sees COP development in relation to customer orientation. Customer orientation is enforced throughout the empirical material. The Volvo Cars brand pyramid was based on customer experience and Volvo's specific differentiators. Customer orientation development has a path that interacts with COP development over time. Table 6.2 illustrates outcomes of the processes from a process view, which is not the whole picture of the development. In the next chapter a closer examination of the actors' situated performance will further explain the relation to profit development as well as to volume development and the resource structure.

Table 6.2 Customer orientation development encountering COP development

	Customer orientation
Encountered COP; resulted in positive profit development	Managerial teamwork reinforced customer orientation and COP. Customer closeness facilitated profitable after sales service. Sophisticated logistics demands in supply chain (lead times, quality assurance, delivery precision, knowledge-based production).
Encountered COP; resulted in poor volume development and a costly resource structure	A lack of customer knowledge. Learning about customer demands and developing involved uncertainty, e.g., need of 14 or 28 days in order fulfilment process; "common good" solutions were not enough "private good".

Table 6.3 describes volume orientation development in relation to COP development. The stagnant growth created tensions especially in conjunction with the overriding cost objectives. A process view of COP in relation to volume orientation (Table 6.3) illustrates outcomes such as boosted sales as well as a customer-disoriented sales model. Sales increased with the development of the sales offer by cooperation and new combinations of the product sold and with the interaction related to the transaction. Also, promotion and marketing increased. In addition, short-term sales increased with speculative ordering that increased interest in selling based more on the

possibility that COP can be used for both stock orders and customised orders. Volume increase was needed in order to share development costs. Sales challenges were imposed to push sales by dealer bonuses; COP rules were reinterpreted, demanding volume flexibility rather than variant flexibility. Late minute changes increase uncertainty and complexity in the supply chain. COP development projects were superseded by projects to manage volume changes.

Volume orientation also implied customer disorientation. Push sales restrict perception of premium brand image and are difficult to combine with the value-based sales of COP. Special offers promoted sales but made rare product innovations a costly add-on. Profit from special offers relies on a cost equation while customer value relies on an income equation in which one part is direct and one part is long-term. Special offers gave customer satisfaction in the sales moment rather than after the months/years that were evaluated in independent assessments, important for the brand image. Volume orientation combined with specialisation in order to reduce costs was on the managerial agenda, and COP tended to be undermined by functional decisions in line with this at several places simultaneously. Accountability for short-term results was driving a volume increase that diminished COP advantages.

Table 6.3 Volume orientation development encountering COP development

	Volume orientation
Encountered COP and resulted in boosted sales	Cooperation and new combinations in the offer that relate to customised products and standardised customised products
Encountered COP and resulted in a customer-disoriented sales model in that customer value and innovative features became secondary to volume-boosting lower prices	Push sales threatened premium brand image and are difficult to combine with the value-based sales of COP. Push sales enforced another type of order-to-delivery process. Awareness of customers' value and knowledge in trends decreased. Increased discrepancies in forecasts based on dealers' risk-taking together with low costs as costs were shared with the supply chain.

Table 6.4 illustrates outcomes of the COP process in relation to platform/product development. The platform/product strategy enforced the niche role that Volvo Cars played in order to produce a premium brand. Many new products were launched and sales increased even though products were sometimes seen in a "more of the same" development based on specialisation. COP was seen as a prerequisite to managing production in the customer-oriented business model with many variants. Platform use for a group of cars, modularisation and a reduced supplier base facilitated specialisation. Cross-functional teamwork and coordination in the supply chain permitted variant-flexible assembly and supply chain coordination increased flexibility.

Table 6.4 Platform/product strategy development encountering COP development

	Platform/product strategy
Encountered COP and resulted in boosted sales and many product launches.	Supplier partnership and cross-functional teamwork and coordination increased specialisation. Frequent product launches increased customer attention. Dealers enjoyed the products.
Encountered COP and resulted in idiosyncratic development patterns, "more of the same".	Industrialisation of experimental concepts seen to have idiosyncratic interaction patterns in order to deal with complexity.

Table 6.5 illustrates the COP process in relation to the working method of projects and teamwork. Outcomes of experiential and pragmatic learning were seen in the coordination and integration in the business network. Cooperation for flexibility and reliability is ongoing with much interaction and so is coordination in the business processes of product development, order to delivery, sales and market. In addition to intra- and inter-organisational development work, the openness in automotive industry facilitates learning. The complexity of COP also created unsettled debates. For example, the possibilities of transparency related to increased integration and coordination challenged the areas that were prone to conflict in the supply chain, especially logistics, suppliers and purchasing. Experiential learning is difficult to evaluate except in hindsight as different implications of decisions are seen.

Table 6.5 Project and teamwork development encountering COP development

	Projects and teamwork
Encountered COP and resulted in experiential and pragmatic learning.	Multiplicity and experimentation of projects facilitated learning. Cross-functional and inter-organisational focus on a project created legitimacy. Openness to learning by collaboration with many different stakeholders facilitated creative and customer-oriented solutions.
Encountered COP and resulted in unsettled debates.	Learning from industry questioned the Volvo-ish and brought in ideas from another context as best-in-practice goals. Ambiguity of business processes and teamwork goals in relation to organisational report system goals.

Table 6.6 illustrates outcomes of COP in relation to cost-effective goals from a process view. Cost effectiveness increases from synergies in the coordination with Ford. Also cost effectiveness through decreased lead times and lean principles relates to supply chain and customer value. Management by costs gave sub-optimisation in relation to COP in that capacity utilisation was enforced. Also, reducing costs by far-away production put delivery precision at risk because of an increased number of uncertainties. In the development the

production was in the centre of actions in order to reduce costs and be best in class, which both hinders and fosters customer orientation.

Table 6.6 Cost-effective development encountering COP development

	Cost-effective goals
Encountered COP and resulted in increased value along the supply chain.	Synergies from Ford coordination and lean principles in supply chain network. Initiated a debate in which cost metrics (incl. efficiency) were simple to understand.
Encountered COP and resulted in sub-optimisation.	Cost-cutting actions increased costs of variant flexibility. Comparison in a best-in-class logic undermined the Volvo-specific for more explicit manufacturing-related goals.

The concluding discussion of evaluations of ongoing processes encountering each other is important to the understanding of effects in the COP development. Performed COP actions were formalised but the situation changed in line with market development and other supply chain or organisational processes. The COP assumptions and the meaning of COP might, illusionary, be the same while the changed situation implied changes in performance as well as in outcomes that will be discussed next.

Chapter 7 - Performative effects

Strategic outcomes are snapshots of the development over time. Formal and informal evaluations of the actors in a supply chain are temporary and are used as arguments in debates. A strategic development will, however, have its effects and in practice many are social effects that are important to the development. In this chapter, I will account for situational outcomes as a part of the performance. In this line of reasoning, the development is now seen in parts, such as the relationships, and in social practices, such as the chimney model that plays a vital role for customer ordered production. Performance has to some extent already been discussed, but now the focus is on local effects of the simultaneous happening in terms of buying a new car, selling a new car, distributing customer orders, building customer orders and supplying to customer orders, and the means for connecting actors. Before the change is summarised, the chimney model practice is explained in more depth. The preceding chapter discussed COP and its development, in relation to simultaneous objectives and agendas. The objectives, agendas and approval of projects are interdependent. Performative effects are highlighted in this chapter based on COP.

Buying a new car – the customer

The automotive industry distinguishes between sales in the USA and in Europe, because the distribution increases the lead time to the USA but also because the US customer was seen as less inclined to wait for a car. Therefore, COP was meant for the European market.

The car might be seen as a commodity but is an expensive purchase to most customers. A potential car customer at a dealer's showroom was asked about the purchase during the financial crisis in 2008, whether the state of the market influenced the purchase: "I will definitely not buy a car today. I will go to a few different car manufacturers and see what they might offer. One has to take a closer look at one's economy and not be too hasty." This particular car customer had a few outlets to visit before deciding what car to buy. A car dealer commented on this shopping around: "Nowadays, customers are in general not that loyal. This time they buy a Saab and that time they buy a Volvo just because of the fun of switching – especially the younger ones." The car customer referred to did not want to rush into a purchase as it impacted his economy and the cost of ownership mattered. During the financial crisis new cars were sold with an SEK 20,000 discount from the retailer and offers from dealers were frequent. More push-based sales created reduced costs for customers who evaluated and put offers against each other instead of using the customers' wants to customise an offer. Buying a new car like this was to shop

around instead of connecting with a dealer in a one-stop shopping for best offer.

Selling a new car – the customer and the dealer

The goal was 100 per cent customer ordered cars in Europe. In the late 2000s, customers could specify their own car but the option was not used in all cases. The use of COP was more frequent for company cars, for which a firm pays a certain sum and the employee selects the specific car. Even though private customers had the same opportunity to buy a customised car, this happened less often because the price was a more important factor in the purchase. Furthermore, a non-customised car could be delivered sooner, since dealers might have the car in stock or they might have ordered a car themselves. In the latter case, the car was predefined by the dealer but had not yet been assembled. The dealer was also more inclined to give a discount on such cars. In other cases, customers were persuaded by a promotion campaign to buy a predefined car during a certain period of time. In the short-term perspective, both parts were satisfied. An exception was the customer who intended to buy built-to-order but bought a predefined car. In this case, the deviation from COP creates a lower customer value score on the dealer's performance indicators. Stock cars generate lower revenues per car; they might be discounted and predefined with extras that would otherwise be profitable. However, the dealer's revenues per car were also related to incentives and bonuses, which were an important income stream. The bonus system offers incentives to push sales of cars built on speculation. It is a dealer question of bonus or customisation of cars, which are evaluated as short-term benefits versus customer value and long-term benefits.

Stock cars were a risk for the dealer that obscured the fact that sales change over time. "What will happen when the market changes? I feel nervous when the market stagnates a bit and I know that we have lots of cars on their way into our stock." Volvo dealers competed with other Volvo dealers and if others offered a campaign car, they wanted to match, which pushed the trend.

As long as the demand for new cars was rising or at least steady, the LTO strategy was prioritised by dealers. Cars in stock were easy to sell, particularly because of increasing delivery times. Some dealers tricked the order/planning system by ordering basic but popular modular combinations. When a customer was prepared to buy, the dealer made a change in the order to the factory (if it was within three weeks before start of production). This was a manipulated COP that increased the number of late changes in supply chain plans. Over time, there was less of matching sales and demand, the customer orientation was distorted and the behaviour of selling cars was changed. Through the

bonus system and different forms of "quick sellers", the premises for COP production had been altered.

Distributing – the sales company and the dealer

The Swedish dealers were most often local and autonomous firms facing the end customers. Volvo Cars saw the dealer as the most important interface to the customers. Almost all dealerships (in 2003 there were 2,300 authorised dealers around the world) were owned and operated as private businesses. Dealer satisfaction was regarded as consequential to customer satisfaction. In addition to new car sales, dealer activity includes sales of accessories, parts, workshop services, pre-owned cars and financial services. The EU's Automotive Block Exemption Regulation relating to motor vehicle sales came into full effect in late 2003. Under the legislation, a sales company or car manufacturer were allowed to decide about establishments, among others, for the benefit of final customers. After, dealers were free to sell cars of other makes in order to multi-franchise, and Volvo Cars took action to ensure dealer quality and to improve its status as a car distributor.

Sales companies were regional (most often also national) automobile trading companies for marketing activities, and the Swedish dealers worked with the Nordic sales company managed from Gothenburg, Volvo Personbilar Sverige (VPS), which was a subsidiary of Volvo Cars (Figure 7.1). COP changed the role of the dealers in order to promote customer orientation. Dealers were expected to have more of an advisory role helping the customers in their choice of a customer ordered car. Many of them upgraded their existing facilities to showrooms. The dealers became more important actors in the order flow. The dealers' orders went directly to the factory instead of via the sales companies.

The role of the sales companies changed concerning forecasting and ordering; their forecasts were not seen to be needed any longer for production. Factories should wait for orders from dealers. However, a forecast of the estimated sales of various models was needed to secure capacity. One reason was that delivery times vary and can be relatively long for some components. Deviations from the forecast might mean a shortage of components. A rough forecast was needed both for production capacity and for available material. VPS as a market specialist saw certain patterns in the choices made by customers and commented that the choices did not vary that much but were rather influenced by trends in society. They also interacted with dealers in order to improve knowledge of future sales.

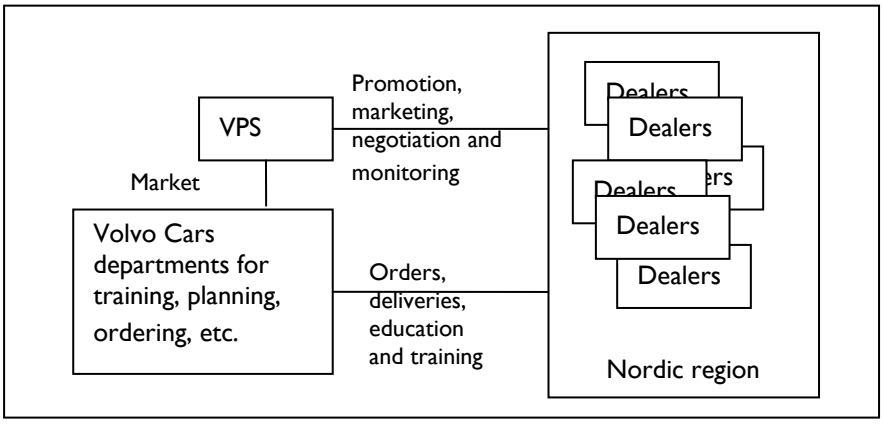


Figure 7.1 Structure including Volvo Cars, VPS and dealers.

It would be reasonable to suggest that the expensive stock of new cars would be close to zero, because of the parties' assumptions of COP superiority. The dealers involved had changed considerably and the sales companies were convinced that selling only customer order produced cars would be the most profitable solution. Moreover, COP was seen as needed in a premium-brand business model in which the cars and accessories involve advanced product development. From the sales companies' view, the COP business model relied on customers who chose to add options and were willing to pay for added value. However, despite COP, a dealer might have 100-150 cars in stock. The sales company had changed the objectives for dealers in order to increase dealer risk and thereby increase dealer responsibility for sales. However, the volumes that were pushed for sales in the late 2000s were unreasonably high, with regard to the sales company. Sales were based on incentives and more than half of monthly sales seemed to be speculative orders from the dealers. After the change to COP in the 1990s, the only cars a dealer could have in stock were demo cars. All European cars were built to order. However, since then other forces have come into play.

One reason for having cars in stock was the pressure to sell more. At the US market, quick sellers were common. A quick seller was a low-cost package including a car available from stock and a set of accessories. The new American owners' opinion was interpreted as "dealers need to be pushed in order to actively sell", i.e., 100 per cent COP will not lead to active selling. Therefore dealers were encouraged by incentives to have cars in stock and push sales. An incentive system was seen to increase volumes, stimulate demand and increase capacity utilisation. The sales company interacted with Volvo Cars' planning in order to set up such push sales. However, the sales company's view was also that a dealer stock was a great risk to the dealer's financial situation and that quick sellers damaged the preferred business model and also damaged trust in the relationship because of continuous changes in their agreements.

The sales company coordinated with dealers regarding future sales. The common plans were the basis of production forecasts and were a prerequisite for sales and sales margins. However, if the top management's plans for growth deviated from the sales company's/dealer's plans, then the latter were aligned. The last mile in terms of increased sales could be stimulated with the right incentives, according to quick-seller logic. Such logic was seen to affect the dealer/sales company relationship, trust and commitment to obligations. The sales company and the dealers agreed on sales targets, and if these were too low in relation to the financial targets, they were aligned. Extra volume was added, which became quick sellers. On the one hand, dealers committed themselves to an agreement with the sales company, regarding what was possible based on a set of conditions such as sales support. They had responsibility and knowledge regarding the activity. The agreement defined what was possible and how it should be rewarded.

On the other hand, the sales company/dealer agreement was regularly overridden. A new agreement was enforced, based on top management objectives of efficiency in achieving the manufacturing and financial targets; these agreements could be seen as an adjustment of volumes, but the adjustment also transformed the whole agreement, because the sales company/dealer agreement was put in a new context of more cars on the market and competing offers to the customers. The dealer situation would be changed, because customers compared not only different brands but also different dealers' offers. In a geographical area, neighbouring dealers' numbers of cars would affect other Volvo dealers' sales. In this way the adjustments of agreements that were enforced by management-by-objectives sales targets also hurt the trust in dealer/sales company agreements.

Having a quick seller is the wrong reason to sell a premium car, argued the sales company. As an exception to the rule, quick selling might fuel sales but when it was used continuously, the business model was undermined. However, some variants, such as the C30, implied less risk to stock and were seen to be possible to be handled outside the COP business model. The sales company lacked a discussion of method and potential implications. Also, dealers were in two minds about the change in business model. The bonus was an important income for dealers but it also increased their risks, which the sales company took advantage of. By changing the basis of bonus from sales targets to order targets, the risk was handed over to dealers in order to prompt them to order more and so sell more. The manoeuvre increased short-term volumes by 10 to 15 per cent. The bonus system was a financial incentive, beneficial to sales when the market experienced positive growth. The dealer would most likely sell the cars at a discount offering fast delivery. Dealers might also offer discounts for the COP model; these were based on the argument "the more options the customer defines in their order the more discount". Besides the quick seller and the customer order, dealers manipulated the order system in order to take advantage of it. They predefined some orders in the pipeline that could be

changed before the orders were produced to avoid longer delivery time than a competing dealer might offer and they ordered stock cars in order to reach an order target or to secure access to popular models. Consequently, COP sales targets were far from 100 per cent in the late 2000s and the meaning of COP sales had changed. COP might be related to a customer's order to a dealer, and COP might be related to an order based on Volvo Cars' speculation to reach financial targets or to speculations by the dealers. The speculative orders were treated as customer orders if they were in the order queue when being sold. Thus, the percentage of cars that were customer ordered was closer to 40 per cent than 80 per cent.

Thus, COP targets were influenced by whether the car was sold to a customer when the car was on line; what was happening before was influential to the business logic but less influential to the acting objectives. Push sales were seen to boost sales by 10 to 15 per cent, allow substantial discounts to dealers and to customers, imply extra promotion, cause radical speculation in demand (more than 50 per cent of sales) and increase dealers' costs of capital together with their risk exposure, which might threaten the Volvo Car dealer network. COP implied higher incomes obtained from each sale, costs for showrooms and promotional sales. COP relied on stable forecasts but some changes between forecast and order, i.e., before the car was in production, were natural from the perspective of the sales company and the dealers. However, in the major market for the customer-oriented logic, the Nordic region, COP was estimated to comprise 80 per cent of the production but customer order based sales were closer to 40 per cent in the late 2000s.

Building cars to customers – the sales company and the manufacturing

COP changed the sales companies/manufacturing relationship, since orders to the factories were received from the dealers instead. The more than 2,000 dealers in Europe were problematic as they were allowed to continuously make changes in their orders, which necessitated a new information system. In the sales company/manufacturing relationship forecasts were needed in spite of the coordination of production to dealer orders. The suppliers and the plants needed to have forecasts in order to secure capacity for future sales. Forecasts were a basis for planned production, the departing point of purchasing, while orders started the production process. Forecasts were also the basis of possible flexibility in production, which was set by the model in use, the chimney model. The reduced role of dealer and sales company forecasts and the increased role of financial targets in the forecasting reduced the precision of forecasts and had implications for flexibility that in turn affected costs and delivery precision.

The sales company/manufacturing relationship involves negotiations in which production basically wants to minimise costs by having high capacity utilisation and stable production plans, while the sales company wants to increase revenues basically by customer orientation but also by speculation. The possibility to improve scale economies and shorten delivery times increases the importance of stable rather than speculative forecasts. But speculation was seen as important to push sales to reach the extra volume. The pressure to push sales also affected manufacturing, because dealers needed to cope with frequent changes in car specifications close to production initiation. Changed specifications were more and more common, caused by speculative orders in addition to customer changes. If a change occurred and it was automatically permitted, i.e., it was within available capacity, the order maintained its position in the order queue. In other cases, the change needed to be handled manually and people involved tried to find a solution, such as extending flexibility limits or even renegotiating agreements and evaluating costs involved. Therefore, an increasing degree of change involves much extra administrative work and coordination of several actors, involving the plant, planners, purchasers, supplier planners and supplier's sales function. Several of the managers involved expressed implications of manoeuvring with material, reserved via delivery plans, time after time.

Problems related to customer orders versus stock orders, such as an increasing number of changes to orders, were negotiated mainly within Volvo Cars marketing, planning and logistics functions. The sales company/manufacturing relationship involved a large number of people, a hierarchy of influential individuals with different organisational responsibilities related to the order-to-delivery process. The business processes that were crucial for implementing COP, in which the order to delivery process was involved, had lost some of their earlier attention. Implications of this scenario were negotiated mainly when urgent measures were called for. Gerry Keaney, senior vice president of marketing, sales and customer service, expressed in 2007:

> "Being part of the Ford Motor Company is a fact of life for us and I know that Ford are very positive to the Volvo brand. We have a responsibility to deliver a profit to our shareholders and we have the same responsibility to ourselves. Ford knows that we do not want to be a smaller version of itself, but that we want to continue to develop our own, particularly strong and distinctive brand. Our name and our heritage make us unique and give us the opportunity of continued development. That said, if we need to adopt cost-cutting measures, we will naturally do so. That's life in a major concern!"

The issue of changes in orders affected selling as well as manufacturing. Sales depended on changes because of compliance with volume targets that made forecast accuracy less likely. Their ambition was to increase sales.

Manufacturing depended on forecast accuracy in order to keep costs down and was unprepared to handle stock orders in relation to customer orders. Both types of orders were handled similarly. A rhetorical question was then, what is a forecast?

Changes to match speculative orders with later customer orders were common but an increase in number or in content stressed manufacturing and supply chain flexibility and caused extra administrative work, extra transports and safety stocks. This was interpreted as industrial logic versus business logic in the recurrent internal debate. The logic of manufacturing was based on stability in production while sales logic was based on stability in delivery time. Basically, in an era of focus on costs, customer orientation and COP became less important in relation to other issues. How manufacturing handled an order was the same but the likeliness that the forecast would materialise as an order decreased. Therefore, the available flexibility diminished quickly. The increased number of stock orders and a simultaneous focus on costs put pressure on manufacturing. For example, the cost focus approach led to less slack in the material flow, less stock and a lower propensity to have overcapacity. Also, functions within firms and at different firms reduced the possibility to fix and coordinate changes in orders when they optimised their specialisation. Economy measures taken in different departments contributed to the decreased possibility to coordinate changes: volume targets boosted forecasts, cost targets decreased purchased supplier flexibility, stocks and extra transports. As a business process, however, the order-to-delivery process followed the process of product development, in which customer orientation was essential.

Supplying just in time to COP – the manufacturer and the supplier

The performance in the order-to-delivery process has several objectives depending on different functions of Volvo Cars' organisation. It is natural that these have different agendas because they have different day-to-day tasks, skills and practices of managing. Different functions are affected differently by the development and dilemmas in the development.

Product development

Customer orientation was fuzzy and was debated by marketing and sales in relation to COP. Customer-oriented product development was, in the implementation of COP, crucial in order to expand volumes of customer-oriented products applying to different Volvo Cars' customers. In order to increase sales volumes by a customer-oriented logic, the product development organisation took off from customer groups and developed innovative features

that those customers would be willing to pay for. Despite the flow of new and innovative products, the customer-oriented product development was questioned by employees, who perceived a dominant logic based on former development, among others, as more influential to the outcome than customer orientation.

Specific product development projects did involve customers to a great extent but, in general, automotive industry quantitative measures were used rather than Volvo Cars' specific customer and market knowledge. Much change occurred, the R&D organisation changed, and supporting technology and production changed several times in different phases (line organisation, project organisation, modularisation organisation and platform-based organisation). However, customer orientation was difficult to develop. The history and the power of technology and formal processes supported technology development rather than customer-oriented development. The product development strategy (see account by researcher/Volvo Cars manager Setterberg 2008) was dominated by an interpretative set of values together with little organisational slack. Influential individuals and norms shaped the development. And, the interpretation of the new strategic norm in relation to the change in knowledge, organisation, routines and decision and evaluation systems limited the outcomes. The little slack suffered groupwise reflection of development. Understanding of the implications was difficult because of partial change in knowledge, organisation, etc. The increased product range improved neither the sales volumes nor the profit. Why? Some employees perceived that the increased product range attracted the same customers, and others argued that exclusive features were bundled as standard packages in sales in which the expected higher margin was eroded. Thus, despite cross-functional and organisational cooperation, the decision making seemed to be limited and sub-optimised from the point of view of the customers and COP.

Purchasing

A parallel and somewhat similar development of customer orientation seemed to be the case in the purchasing organisation. After a car project's approval and production programmes, purchasers would buy tools, meet suppliers and arrange for material. Customer orientation was peripheral but costs were central. Costs of purchasing were, among others, related to accuracy in plans, because too much and too little capacity is expensive. Purchasing was a powerful function represented in the top management team together with manufacturing, in which the communicated top priority was lean production, interpreted as finding the right cost. N.B.: Volvo introduced the 'lean production' system into its car operations in the early 1990s (Liu et al. 2004). The lean and flexible production was seen to facilitate customer orientation but flexibility was operational supplier development rather than customer orientation. The strategies were intended to co-exist: "*We build premium cars, with*

a focus on lean and flexible production and care for the environment" (www.volvocars.com, business areas, downloaded 1 April 2010).

The renewed lean strategy came about in 2006 involving the manufacturing system and thereby logistics, operations, machines, packaging and assembly, among others. One purpose was to reduce complexity by centralising decisions regarding production. Another was production stability, which meant that fluctuations in demand were managed with a variable delivery time rather than variations in utilisation of production capacity. The problem had been the fluctuations in volumes rather than in variants. Purchasing was, basically, held responsible for costs and annual cost reductions rather than customer orientation and flexibility. Buying at the right cost also related to other important objectives of manufacturing lead time and delivery precision. Often, delivery precision and quality were developed together with suppliers (and other functions within Volvo Cars) while flexibility was interpreted as being prescribed and an add-on in the agreement. Also, purchasing objectives to develop post-merger synergies and low-cost sourcing headed in another direction than flexibility. Low-cost sourcing, corporate social responsibility in purchasing and economies of scale by increased commonality became strategic issues, while COP qualifications became a less important operative goal.

In the implementation phase of COP, German and Swedish suppliers were common but over time the number of low-cost and far-away suppliers increased. Synergies with Ford Purchasing were important in order to gain by volume and take advantage of commodities, according to Steven Armstrong, Volvo Cars' chief operating officer, in an interview regarding the fact that the relationship in Europe between the Ford and Volvo purchasing teams was extremely strong (Dave Leggett, Automotive News, www.just-auto.com, 7 October 2008). They had a number of common suppliers where they used common technologies, and they conducted joint negotiations for a volume advantage. Together with Ford, Volvo Cars Purchasing also had a 'commodities business plan' involving strategies for different commodities on vehicles. Consequently, the functional purchasing expertise was developed with Ford people, and purchasing specialisation increased while flexibility came into the background.

A shift in objectives materialised with less flexibility in, for example, engine supply. Suppliers were affected, directly or indirectly; costs for inflexibility involved costs for overtime and airfreight for near-term changes in the production program. Overtime was negotiated by the purchasing function while airfreight was often paid for by manufacturing for far-away suppliers with long transportation lead times. Changes in the short term gave rise to conflicts within Volvo Cars, between its functions and with suppliers. Suppliers were developed, among other things, via certification, control and common workshops. Volvo Purchasing often had a long-term perspective and used single sources of supply because of their investment in tools for future

production. The supplier base was important in terms of, among other things, quality, technique and costs.

The business relationships were important to the suppliers: "*We have a strategic view on the automotive. We decided that the automotive customers are important because new things happen all the time, and the competition is tough and there are such strong driving forces. It is thereby no goldmine but it is a big market that is relatively stable in the long term*", a supplier explained. Common strategic development was an often-cited characteristic of automotive supplier relationships. And in the implementation of COP the increased control of the material flow was something new to Volvo Cars' suppliers and an advantage as other OEMs started to implement similar demands. Basically, Volvo Cars required the supplier to reduce lead time, improve delivery precision and take control of information and material for one-piece production.

Planning and ordering

Operationally, Volvo Cars' manufacturing was guided partly by its planning processes that were of a hierarchical character and partly by order processes, the application of EDI for Volvo Cars. First, regarding planning, in a long-term perspective, Volvo Cars' strategic planning was used to hint at what future technical capacity was needed, which had implications for investments. A supplier noted: "*We have binding agreements for the platform's life cycle due to our investments in equipment, i.e., about seven years.*" Far-reaching changeover, for example, related to increasing or decreasing the technical capacity of the production facility in a ramp-down or ramp-up situation and was based on sales forecasts and results in a planned industrial capacity. Planning in a shorter perspective involved production and deliveries within a capacity specified by Volvo Cars Purchasing's orders and agreements with the supplier's sales office, which established a limit regarding what Volvo Cars Manufacturing should be able to expect from the supplier in the production planning: (1) The master planning was based on market sales forecasts and resulted in production speed and delivery schedules in a COP logic in which the business planners' role had been to substantiate forecasts. However, financial demands and volume targets from top management became decisive in programming, which implied a higher risk than when forecasts were used. (2) The production planning was based on customer orders and resulted in a production plan and delivery schedules. It was governed by chimney rules, which will be further explained in a later section, The chimney model. (3) The sequence scheduling was based on a production plan and resulted in a production sequence.

The different levels of planning overlapped and involved different people and different time frames. The master planning horizon was 60 weeks. It was updated monthly with a production programme that would be in force two months later. Because of the changed routines of forecasting, this production programme for plants and suppliers had started to deviate more and more from

the orders. The speculative plans were handled on the next planning level like the ordinary close-to-market planning. Consequently, the two different planning processes fell into the same order process. The production planning horizon was five weeks and was updated every day with new orders replacing preliminary ones. The increased deviations required a great deal of coordination in order to manage the individual changes and if that was not feasible, the original forecast car was produced and the changed specification was put in a queue and produced later. The sequence scheduling horizon was one day and was updated continuously. The complex planning processes were dynamic for contingencies. The master planned capacity needed to be coordinated with changes in the forecast. Then the suppliers' capacity needed to be adjusted which potentially evolved into a constraint. The flexibility available in production planning was related to the changes as well. Also, within the expected capacity, dynamic variation might create constraints because suppliers were far away; they might have advanced products and many article numbers. A large number of colours, variants in surface treatment, etc., increased the complexity related to flexibility. Cross-relatedness meant that the same suppliers needed to increase short- and long-term capacity and work overtime in near time, which put considerable pressure on them. The contingencies gave rise to interactions and sometimes conflicts among people in the deliveries, coordination and sales/purchasing.

A sub-supplier that works up raw material to the automotive industry noted that "the relationships are rather complex. We are a part of different supply chains and our products are used by the OEM, i.e., the car manufacturer as well as by the OEM's suppliers. We are first-tier supplier or both first- and second-tier supplier". The production was process-based, which increased the importance of forecasts in production. The sub-supplier's account manager stated "we do work customer based but we do also have a production cycle that is inappropriate to adapt to any type of Kanban principles. We cannot make one-piece production because of our type of production process. Based on the customer's weekly demand, we do a production plan that optimises our total production. This means that we might produce a product every second week". Shifting demand, such as in ramp-up and ramp-down phases and for spare parts, became problematic to this supplier that needed to rely on the forecasts in its production and stocks to handle changes in demand.

Other suppliers were more involved in the coordination. A system supplier such as Volvo Cars Engine had in-sequence delivery arrangements with Volvo Cars Manufacturing in order to facilitate their one-piece production with possibilities for customised production. Figure 7.2 illustrates the structure of a supply chain with sequence supply. In 2009 the engine plant had about 300 suppliers, of which more than 90 per cent were European. The engine plant was located in Sweden and delivered engines to engine centres in close proximity to Volvo Cars Manufacturing. The engine centres finalised the sequence supply by delivering an assembled engine with transmission on a

subframe; these powerpacks were ordered four hours before needed for a specific car on the car factory's line.

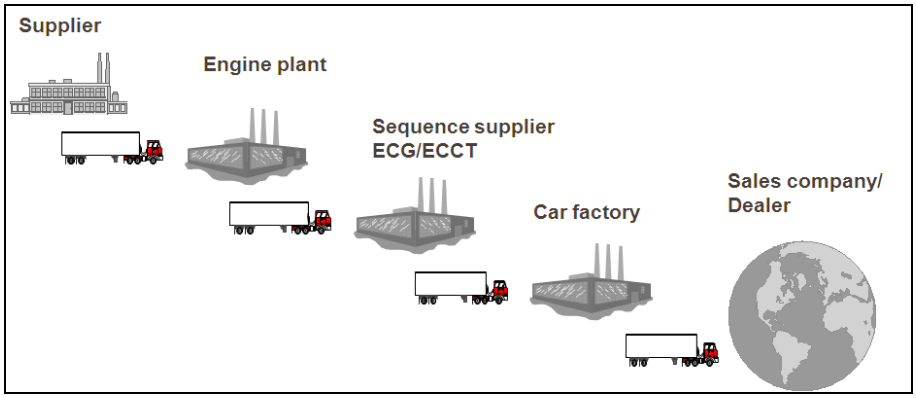


Figure 7.2 Engine supply chain. Source: Presentation material, Logistics, Volvo Cars Engine, Cecilia Carlsson, 2008.

In 2008 the customer order process of Volvo Cars was approximated to 20 days in the EU and 35 days in the USA. Volvo Cars Engine, the engine plant and the engine centre was responsive enough to operate within the customer order process (see Figure 7.3, customer order point equals customer order decoupling point). The customer order point showed where the engine supplier treated the product as an engine for a specific car in the order flow. As long as the car plants ordered engines in accordance with plans, the production process was seen as smooth.

However, the planned production sequence and delivery schedule were not frozen until after an EDI call-off order had been sent from the car plants to the supplier's manufacturing. The call-off order was related to the plan but deviated depending on the car plant's actual production. EDI was a technique used to transmit, for example, delivery schedules between Volvo Cars and suppliers. It was defined as an electronic exchange of structured and standardised data between computer applications of business partners in which systems can interpret the data without manual intervention (http://www.volvoit.com/volvoit/edi, downloaded 23 March 2010).

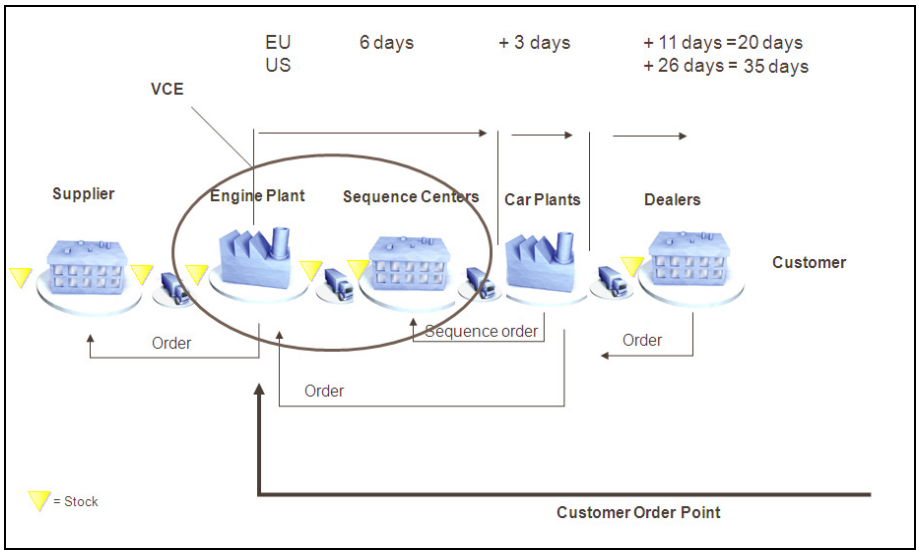


Figure 7.3 Customer order process, Volvo Cars. Source: Presentation material, Logistics, Volvo Cars Engine, Cecilia Carlsson, 2008.

What to produce was decided by the EDI-transmitted call-off schedule, which was an update of an existing delivery schedule. The call-off schedule defined short-term material release information. It was issued from Volvo's plant to the supplier and was based on actual production orders received by that plant. The call-off schedule replaced the contents in a time interval in a previously issued delivery schedule. The call-off was on the one hand instant information of changes in the demand and on the other hand the origin of a hectic sequence of events in order to fulfil changing demands. If Volvo Cars Manufacturing changed the production sequence then the supplier needed more or less staffing, more or less transport space, more or less material, all problematic in the short term. The programme was important to, for example, staffing because the three months available until a programme was in force were needed in order to learn work tasks. Deviation between the planned programme and call-offs was not typical for COP at Volvo Cars. On the contrary, Ford often had greater deviations. Rather, Volvo Cars had historically deviated about ten per cent; the state of the market or a bad decision might have reduced the deviation in a certain month to 20-25 per cent while the deviation continued downwards from 20 to 30 and 40 per cent in the 2008 financial crisis. Thus, effective and efficient operation within the customer order point demanded that the supplier was aligned to changes and to future needs.

Volvo Cars Engine had, in contrast to most other suppliers, an in-depth knowledge of the call-off's construction. Consequently, they could take action to mitigate some consequences. The supplier had 8 days' frozen plan in which the first few days were frozen call-off. The frozen production plan involved

stock cars as well as customer ordered cars on equal terms. These were indistinguishable from each other. Volvo Cars Engine, as a sister organisation of Volvo Cars, had many employees that knew each other and had knowledge about each other's working procedures. In this case, knowledge about the input to and working procedure of the call-off facilitated discussion and adaptation. The senior manager involved in planning and logistics described the construction of a call-off as sequences taken of the order queue. If something went wrong in the car plant's manufacturing, then the remaining production caused changes in the call-off. Potentially, the car plant added a shift at the weekend or decided not to produce the cars, and a dialogue, based on knowledge and interaction, regarding how to handle changes in the call-off improved the supplier performance.

Volvo Cars Engine's flexibility was achieved by production in which different products were mixed interchangeably and had short lead times and short production sequences. Also, the production was based on multi-skilled people that were flexible in time and adjusted working-hours to the need. This flexibility was developed over time in order to handle different variants of engines. The chimney model fixed the demands of the suppliers' flexibility but even if the flexibility was exceeded, the supplier adapted to avoid problems for Volvo Cars' line production. In this line of reasoning, the supplier's planner suggests that flexibility means that the buyer and the supplier can communicate and adapt demands and solutions within agreed-upon boundaries. When such boundaries were crossed, such as introducing a production network and substantially changing the material flow pattern, other means of achieving flexibility were needed. The change in material flow resulted in great variations in volume rather than variants because different suppliers supplied different variants. The worked-up flexibility of Volvo Cars Engine depended on somewhat fixed volumes and the change therefore reduced the possibility to base their production on customer orders.

Thus, supplying just-in-time to COP involved close coordination among functions within Volvo Cars and interdependent firms. In their discourse customer orientation was abstract and flexibility was defined.

Connecting the actors – collaborative technology and transporters

Information technology played a major role for supply chain collaboration and coordination of COP. For example, the EDI's role for ordering and the information system for dealer orders were pivotal to decrease the lead time. The example of supply chain monitoring would rather improve flexibility than improve efficiency. The supply chain monitoring concept was seen as a strategic project by its intent to inform about actual demand and supply.

Technically, the monitoring project dealt with problems in the planning and order process but the information needed to be incorporated in the daily routines in order to make a difference. Consequently, the monitoring concept was an intellectual and technical solution that was difficult to integrate in the daily routines, because it was different in its scope and more collaborative than the written agreements. Forecasts, delivery plans and call-offs in use were approximations of the car customers' orders, based on the supply chain actors' way of optimising their value-adding process. More specifically, if Volvo decided to produce a specific car, they ordered the parts for it. Then, the supplier decided to produce this part, often in a batch, and ordered supply from their supplier. The sub-supplier could not know whether the order was in line with Volvo's demand, whether it was based on speculation by their customer or whether their customer had one order from Volvo and one from Audi. Therefore, increased transparency cannot substitute an order flow.

Forecasts induced high costs for buffers, for safety stocks, etc., but were needed in order to deliver within acceptable delivery times. Information technology, in general, improved the efficiency in transmitting orders and information related to the delivery in the separate relationships. However, in the supply chain the information handling was hampered by each tier's optimisation. An example was the car customer order from a dealer. The information was analysed and used to generate orders to the module suppliers. They analysed the information and generated orders to their suppliers. By each tier's scheduling the demand information was delayed and transformed. Delayed information increases the need to forecast demand information, which creates distorted information, and as the information was used for scheduling production, there were high costs for securing the deliveries.

What information technology meant for the information flow, such as increased efficiency through EDI, transporters meant to the material flow, such as implementation of centralised controlled transports and milk runs for frequent and fast transportation. Transportation was organised in a cost-effective manner while hampering flexibility by batching car transports based on long-term forecasts and less flexibility in inbound transportation than in inbound supply. Therefore, dynamics in production might be amplified by transports, and variation in planning/ordering process affected distribution cut-offs.

COP resulted in centralised responsibility for distribution in order to avoid that every dealer ordered transports of cars based on their capacity utilisation and costs. The decreased lead time meant that there was no time to wait for full capacity utilisation. Volvo Logistics was involved in order to coordinate transport needs. Transport to Volvo Manufacturing was centralised as well. Every morning, based on the orders, material was called off exactly according to needs and the supply was transported to Volvo in a specified way and order. This caused great difficulties for the suppliers. They adapted their production planning to Volvo's call-off system and integrated their production with Volvo

in order to make it function. These flexible suppliers were facilitated with transports and became a more integrated part of Volvo. Even more so, system suppliers were located nearby and had transports coordinated in scheduled milk runs. In the past, Volvo people regularly stayed at certain suppliers' sites to physically make sure that their deliveries were prioritised and shipped. The change implied more coordination and higher demands in that suppliers needed to deliver according to Volvo specifications and transport routes. Therefore, a structure of annual supplier evaluation and coaching was implemented in order to learn from the relationship over time. Volvo Logistics acquired much knowledge about the needs of COP in the development. For that reason, Volvo Cars lost its operational knowledge in transports when Ford bought Volvo Cars and the relationship between Volvo Cars and Volvo Logistics became inter-organisational instead of intra-organisational. However, Volvo Logistics became logistics service providers and the parties worked in close partnership in order to coordinate logistics solutions involving transport. People from Volvo Cars had insight into what was needed for setting up transport flows in new car programmes. Basically, Volvo Cars was responsible for transports, Volvo Logistics coordinated these and transporters provided the transports. The industrial structure was set up to support COP.

The procedure of making late changes implied problems when it came to transports. COP did not involve supply to system suppliers as a part of Volvo's responsibility. Upstream suppliers became less integrated with Volvo in COP. Transports were negotiated by Volvo Logistics but handled, in terms of being ordered, by the suppliers. A transport flow was, in a new car programme, set up in order to optimise transport costs and frequency and minimise environmental impact. The focus was on full loads, optimal milk runs, delivery condition of Free Carrier (FCA), coordinated return transport, choice of means of transport and use of lead logistics provider. On the one hand, the suppliers were governed by demands of flexibility to be able to deliver with short notice. Volvo delivered using a rolling long-term and short-term delivery schedule but in the end the deliveries could only be made on call-offs based on a decided-upon production schedule. Almost all suppliers needed to produce a certain stock in order to deliver on time based on the actual call-off. The transporters, on the other hand, acted on the basis of a logic of regulations, costs and capacity rather than flexibility to accommodate late changes. Consequently, the sub-suppliers were responsive to long-term and short-term changes while the transport firms were utilised in a way that limited the responsiveness in the short term because it would be too costly by their way of calculating rates. Developing lower costs was more important to transporters than developing flexibility. Also, Volvo Logistics acted as a proactive business partner of Volvo Cars in terms of setting up solutions, but the learning and adaptation from operative interactions and needs of flexibility were restricted.

The chimney model

Need of structure to handle flexibility

The principle of COP requires manufacturing flexibility to meet shifting demands. This means a preparedness to change the production plan for changes in orders instead of the old practice of updating the production plans once a month. The monthly updating had been a stressful practice. A great amount of information was released as input to the planners, who tried to optimise production. Experience and optimisation rules were drawn upon in a hectic week after the release and a feasible tradeoff was decided upon, the monthly plan for production and material needed from suppliers.

Efficiency in manufacturing was important. In an era of lean production implementation, which overlapped COP, lead times were shortened. The frequency of production planning had to increase because the objective of the order-to-delivery process was 14 days. First, daily production plans were implemented. However, the suppliers continued more or less with the monthly updates of their production plans. The suppliers' production plans were not aligned even though the need of material in manufacturing changed, and Volvo had to rely on stocks to a greater extent. Some suppliers were not interested at all and then the rule of stock levels regarding how much stock was kept at Volvo in relation to the total supply from that supplier needed to change. Stocks increased to cover the mismatch. Thereafter, weekly production plans were decided upon, which reduced the effects of variability in orders in the short perspective.

Coordinating and aligning material flow was a grand process in order to get deliveries in accordance with frequently updated information. The working procedure they decided was basically to, on schedule, update the weekly production plan daily for changes in the production, send it to suppliers for production the following day and pick up the deliveries the third day. The people at Volvo Cars who worked closely with the suppliers, in order to influence their way of working and to certify that they acted on the daily information, questioned whether that development would ever be completed: it was a continuous development. A procedure for supplier evaluation was developed and yet it focused to a great extent on lead time in order to direct attention to the development of capability to timely deal with demand information and integrate the information with their production plans.

A material clearing procedure

Manufacturing changed their working procedures to shorten lead time and they made more frequent production plans with less traditional optimisation rules. As to the old logic, the costs of production would increase, which did not visualise as a problem. Also, the supply relationships were in development to answer to demands, which was challenging rather than problematic. Instead, costs of transportation increased because a transporter's list of rates encourages

full truckloads while COP favours frequent but smaller loads. The incoming material from suppliers might be responsive to the changes dependent on time for transport, i.e., geographical distance, coordination of production, i.e., their planning and way of handling batches, and assigning priority to the changes. Coordination with suppliers depends in a long-term perspective on what agreements purchasers create with suppliers. These rely, among others, on the visions of manufacturing and logistics functions and what demands they focus on in the operations. In order to implement COP, a change in the supply was handled by frequent coordination. There were no rules or norms to rely upon until the chimney model was developed; this was basically a material-clearing procedure in order to define flexibility on the component level. Its purpose was to be a basis for agreements in the supply chain and to be used operationally in program and order-handling work. It aimed to secure flexible deliveries when demand was changing, especially when it was increasing.

The model implies that a low-volume article was in greater need of flexibility counted in percentage (very low volume articles were counted in numbers instead of percentage). For a supplier such as Volvo Cars Engine, it was possible to shorten its order-to-delivery lead times in order to plan their production in relation to their customer orders. The customer froze the orders six working days prior to delivery. The supplier, in this case, then had one frozen working day excluding time for transport and stock and could make production plans in the assembly matching the customer orders. Therefore changes in the short term were manageable as long as they were changes affecting different variants within the promised flexibility. Because the total volumes were stable, material, staff and transports were planned and available.

The chimney model as a coordinator

The chimney model was interpreted as flexibility among the involved managers at Volvo. The model originated somewhat serendipitously by the time of COP implementation. In the struggle to decrease lead times, manufacturing changed their way of working and planning. An employee who was in charge of these changes got a new job at the central function for material planning and logistics. In between two jobs, this person and a colleague discussed the inherent problems of flexibility. How much flexibility was really needed, over time? By flexibility they meant operational flexibility, in contrast to the technical capacity in suppliers' resources, such as production for supplying a pre-specified amount of goods during a product's lifecycle. Agreed-upon operational flexibility would facilitate planning and prepare suppliers for a certain amount of changes in the short-time perspective. Thus, the chimney model was for incoming material to manufacturing.

The model was based on experienced problems related to more frequent production planning. The two analysts decided that control was not equally critical to all components. Basically, chimney items were selected on the basis of their part price or combined delivery amount and part price. In addition,

other critical components might temporarily be added. The more a supplier supplied, the less flexibility was needed. For example, if the component at hand was needed regardless of variant assembled, then there was little need of flexibility. This means that it was demand variability rather than demand uncertainty that was handled by the chimney model for variants that occurred frequently. Flexibility was needed for changes in the manufacturing process; for example, an extra shift was added in order to either catch up delayed production or shorten an order queue. However, also what was seen as little flexibility created problems in the supply. The most important suppliers delivered in a sequence to match Volvo Cars' manufacturing. The frozen production plan that they got, rather than a frozen sequence production, disregarded some of the flexibility needed in supply because stocks and late changes in orders were needed in the order-to-delivery process but could not be included in negotiation calculations.

The model came into use almost immediately; it became integrated as a rule in Volvo's information systems, which to some extent automatically delimited orders that passed the agreed-upon flexibility limit. However, exceptions were often possible. And the amount of exceptions changed, depending, for example, on the order queue. Exceptions meant that manual checks made sure that the order was possible, for example, by a discussion about the issue with the supplier. The chimney model was related to the forecast quality and times of greater deviations from forecast created a demand for exceptions. Besides such exceptions, the chimney rules were applied according to their prescriptions. The model logic was accepted and used as a routine. However, the users often refer to the employee who developed the model in order to explain the rationale of the logic.

The chimney model need to adapt

One occasion, related to policy negotiations within the Ford engine supply network, could be seen as an exception in which the logic was questioned. This was before the Ford era when Volvo Cars Engine supplied motors to Volvo Cars as a sole supplier. The chimney model was used and implied that volumes might increase by 150 per cent related to a forecast released two months earlier. The flexibility was designed to apply to all 50 engines in the assortment; no late deliveries were accepted due to the sequence deliveries. However, policies for a focused production of different motors in the production network included Ford's engine suppliers as competitors to Volvo Cars Engine. Ford's engine plant in Valencia was chosen as a Volvo supplier. The agreement with Ford's engine supplier was based on top management's production network decisions and the practice of using the chimney model in the purchasing agreements was neglected. Consequently, as start of production was drawing close and the Ford plant was pressed by delivery agreements of COP, they declared that under no circumstances they would take on the chimney model for deliveries. It was incomprehensible and in stark contrast to their way of producing engines.

Basically, their objective was to produce an agreed-upon number of low-cost engines and they accepted few, if any, changes. The Ford agreement in use allowed ten per cent weekly flexibility, which estimated would result in hundreds of millions of Swedish kronor of lower contribution and increased incentives paid. People from Ford's and Volvo's central material planning and logistics became involved in discussions with the supplier people who handled logistics and production. Their way of producing and their supplier structure hindered flexibility by chimney rules. After several negotiations, the parties agreed on a solution in which Volvo agreed to pay for a stock of Mexican components and a stock of finished engines and in return a reduced flexibility chimney model would be put into work. Still, estimated lower contribution margin on customer-sold vs. stock cars together with estimated cost for additional incentives paid due to an increased number of stock cars means hundreds of millions of Swedish kronor to be paid but the additional cost for stock-keeping, about 5 euro per engine, meant that the total additional cost had been halved. The changed rules of the chimney model were applied in the whole engine supplier network, in which the Volvo Cars Engine plant had to reduce their existing flexibility. The whole negotiation process challenged assumptions of the logic, such as what variation do we need to secure by the flexibility model and to what costs. The routine was reassessed by people involved who had knowledge of the challenges, and what was normally a rather mindless involvement of flexibility demands on suppliers became a mindful negotiation based on diverging objectives that had to be united because the upcoming production was drawing close.

Performance of the chimney model was ambiguous. People drew on the model in the daily work. It was a basis in supply chain agreements, it specified objectives and formed operational program and order-handling work. Suppliers improved in accordance with the demands. They reduced the lead time and increased responsiveness to information of demand. The lead time change was necessary to accomplish COP and increase the control of the material.

A mindless actor

The chimney model was a mediator between the market demands on flexibility and the supply side of what was possible. On the one hand, manufacturer planners argued that the dealers had misunderstood COP and sold cars in a wrong way. The planners used the chimney model to protect suppliers from too many changes because any change meant extra activities for already pressured suppliers. On the other hand, dealers were knowledgeable about COP but knew little about the chimney model and consequences for the supply chain of short-term changes in orders. When dealers used stock cars in order to push cars on the market by using incentives to sell cars, they were using forecasts actively. The chimney model was based on order deviations from the forecasts at component level delivered and assumed that customer orders would make up the deviations rather than forecasts. Therefore the chimney

model logic was unsupportive of forecast-based sales. Dealers and the market-side organisation argued that COP should permit changes made in the short time frame but the chimney model restricted such claims. The chimney model was seen as a useful tool to secure deliveries when sales increased. Decreasing sales could be handled by phase-out routines. However, the parallel planning process (planning based on financial measures instead of forecasts) made the plan "too" high all the time. Capacity managers, delivery managers and suppliers experienced a situation with a short order queue where demand seemed to change considerably, which was typical of times of low sales, despite good sales figures. Thereby the costs of sales increased.

Effects in between change and stability

Volvo Cars' strategic development involved many different initiatives and interacting processes as discussed in Chapter 6. Different initiatives overlapped and it is difficult to say when a change started and when it was finalised (see Figure 6.1). However, output in terms of production volume and profitability, also depicted in Figure 6.1, changed in a more precise way. Was this affected by the initiatives? Most likely, but financial performance is difficult to relate to specific actions or situations, because these interact in different ways. Instead of such processual outcomes, local effects of the simultaneous happening in the supply chain (buying a new car, selling a new car, distributing customer orders, building customer orders and supplying to customer orders, transports, IT, together with flexibility governed by the chimney model) are indicative of performative effects of COP (Table 7.1) in the conceptual development of COP. In addition to effects of COP in action, the owner influences the development in different interactions, which will be discussed. Finally, a discussion of long-term and short-term effects of COP development ends the evaluation of COP performance.

Conceptual development

The meaning of COP changed over time in the order-to-delivery execution. In the previous chapter, COP assumptions and changed meaning of COP were evaluated and discussed. In this chapter the performance in the order-to-delivery process is discussed in its different actions. The different actions (buying, selling, etc.) draw on different parts of the COP assumptions and affect the development differently (see Table 7.1). Thus, Table 7.1 is an analytical evaluation of the development of COP in terms of performance effects of these actions. The effects will be elaborated after Table 7.1 as situated effects that complement process outcomes described in Chapter 6.

Table 7.1 COP development

COP (as action)	**Meaning based on COP assumptions**	**COP assumptions that facilitated COP development**	**COP assumptions that impeded COP development**
Customer buying a new car.	Customer satisfaction. Customer experiences. Trust in sales model and in relationship.	Uncertainty avoidance by open negotiations (costs of customisation). Customer interest by way of working with concepts and creative solutions, experimentation and creativity based on knowledge.	Professionalism and consistency were vulnerable to changes in objectives, which led to dissatisfaction.
Dealer selling a new car.	Professionalism and expert legitimacy. A service-provider.	Customer service by creation and fulfilment of customer wants without the added risk of car stocks (rather trust in the offer and showrooms). Responsiveness made higher income streams possible.	Dynamics and complexity in demand/order management prolonged delivery time. Bonuses an objective together with customer orientation.
Market function distributing customer orders.	Central planning. Transparency of orders and trust in timely supply.	Responsiveness eliminated stocks downstream in the supply chain, the part with the most uncertainty (because of disaggregate demand) and highest costs of stocks.	An industrial logic based on economies of scale was seen as the traditional way of how the industry works. This standard lens took over when dilemmas arose.
Supply chain building and supplying to customer orders.	Trust in data of customer deliveries. Interdependency by coordination and integration of procedures and interactions. Delivery precision, common learning and development. Tighter integration regarding use of IT and coordinated transports.	Premium quality reduced lead times and delivery time. Managed complexity. Short lead times saved costs for tied-up capital. Integrated IT structure and transport structure. Problem-oriented common development of coordination.	Costs of excess capacity. Dependencies of demand and supply (rules, procedures and knowledge). Complexity because COP rules were applied despite a lack of customer orders. Concurrent emergent objectives and COP interdependencies were counteracting each other.
Chimney model governing flexibility.	Supply flexibility is needed and depends on short lead times, frequent production planning, coordinated supply chain action rather than stocks.	Procedure and rule that defined the agreed-upon flexibility. The model was a mediator between the demands of flexibility and what was possible.	Flexibility became exploited for objectives other than customer satisfaction and the rule-based flexibility did not resist but served such different purposes.

COP assumptions were an interpreted action in the order-to-delivery process that guided the COP action. However, the assumptions were competing with

other objectives and in a development with these, the order-to-delivery action and the assumptions influenced the development. Figure 7.1 illustrates the interpretation of assumptions in the action interacting in the order-to-delivery process that facilitate and impede the COP development. Its outcomes will next be elaborated.

Situational outcomes of COP development

In the preceding chapter about COP, ongoing processes encountering each other were evaluated also regarding outcomes. Tables 6.2-6.6 show that customer orientation and COP resulted in positive profit development but poor volume development and a costly resource structure. Volume orientation and COP resulted in boosted sales but a customer-disoriented sales model in that customer value and innovative features became secondary to volume-boosting lower prices. Projects and teamwork and COP resulted in experiential and pragmatic learning, but also in unsettled debates. Cost-effective goals and COP resulted in increased value along the supply chain but also in suboptimisation. In this chapter a more situational development is illustrated, in order to learn about effects of the development. This involves changes in performance as well as in outcomes related to the customer, dealer, sales company, manufacturing, supplier, connecting transports, IT and the chimney model.

Effects of COP development related to the customer

At first, performance indicators were positive, as described in Table 7.1 (see COP assumptions). However, the market situation changed and all new cars were sold with a 20,000 SEK OEM discount, in addition to frequent offers (packages) from dealers. More push-based sales created reduced costs for customers that partly limited customers' choice and partly became a reason to evaluate and put offers against each other. Customers needed to shop around, instead of connecting with a dealer with trust in a one-stop shopping for best offer. Volvo Cars experienced a decreased customer satisfaction.

Effects of COP development related to dealer

Initially, dealers got an advisory role towards customers and relied on showrooms rather than stocks, as described in Table 7.1 (see COP assumptions). However, the development related to a smaller number of customer orders, increased importance of price, and discount as a normal sales procedure. In the sales situation, promotion campaigns for quick sellers were drawn upon. Thus, despite sales, the customer who wanted BTO cars was dissatisfied, stock cars generated lower revenues, innovative accessories became fringe benefits to customers accepting an offer rather than extra income streams in a customised deal.

Effects of COP development related to the sales company

A counterculture emerged against the practiced customer orientation. Dealers were pushed to take an active role in sales and to sidestep their advisory role. The sales company encouraged them to take in practices used before COP was implemented. This resulted in more than half of the monthly sales becoming dealer speculations and in increased stocks, extensive use of quick sellers, increased importance of the incentive system in order to raise volumes, stimulate demand and increase capacity utilisation. The trust in customer orders diminished as the negotiation of pushing sales took off. Short-term volumes increased by 10-15 %, the premium brand image was undermined and the dealing undermined satisfaction, discounts reduced incomes, accessories became commonplace and a cost rather than an income stream. The counterculture messed with the order system that treated all orders as customer orders and resulted in late changes in supply chain orders, longer delivery time and a less efficient production system. In the order system it was suggested that 80 % of orders were customer orders, a figure that in reality was closer to 40 %.

Effects of COP development related to manufacturing

The COP development reduced flexibility because the procedure of handling forecasts by transformation to orders changed. The number of changes and the content of the changes in the transformation increased, which used up available flexibility. The procedure led to extra administrative work and coordination work among actors at the plant, planners, purchasers, supplier planners and supplier's sales function with effects of frustration and costs. In addition, costs for extra transports and safety stocks were problematic. Frustration grew because increased manufacturing efficiency was demanded, presupposing stability in orders. The producers accepted less slack in material flow, less stocks and overcapacity. Coordination became difficult because the role of the disciplinary functions as specialists increased because they needed to match cost reductions in departments.

Effects of COP development related to supplier

Lean manufacturing and COP demands were beneficial for the common development of coordination and integration, with added benefits in product development, purchasing and planning and ordering. The premium-product development was affected by changes in knowledge, organisation, routines, decision system and evaluation system, which together with little slack for groupwise reflection and projection affected customer orientation. Purchasing for COP became more cost-oriented. For COP development flexibility was key while costs were a major concern for purchasing. Flexibility was included in negotiations with suppliers as an operational issue rather than a strategic one. The role of flexibility diminished as costs became more and more important.

Post-merger synergies and low-cost sourcing limited the flexibility because volume advantages in negotiations with Ford circumscribed it. The planning and ordering of the customer order process developed into 20 days in the EU and 35 days in the USA in 2008. COP had increased the integration so that production, within the customer order decoupling point, functioned in concert re the customer order and Volvo Cars Manufacturing, based on frequent updates and dynamics. Efficiency in supply had increased considerably through routines. However, the customer order affected only planning/ordering at Volvo Cars; subsequent suppliers relied on information from the closest user, which could be an order based on their optimisation of batches, production series, delays in production, etc. Purchasing and planning/ordering acted in overlapping networks with regard to flexibility. The purchased flexibility was a frame that planners could take advantage of and that suppliers needed to adhere to. Sometimes planners needed more and suppliers were unable to fulfil the obligations. Such instances were negotiated either at an operational (and sometimes managerial) level and sometimes at a business level.

Effects of COP development related to transports/IT

For example, EDI and IT for dealer orders and centralised transports were decisive for the functioning of COP and were a part of routines in the order-to-delivery process. However, the facilitating role of Volvo Logistics and IT in COP provided efficiency but developed little. Basically, costs of transportation increased with frequent and smaller loads which were handled by central planning. Transports developed in other directions than towards flexibility, such as involving global operations or environmental issues. Flexibility and flexible capacity were not on the agenda. As with IT, the plan to increase transparency was difficult. Daily routines relied on written agreements and an order flow, while transparency relied on a development of COP.

Effects of COP development related to the chimney model

Flexibility in the order-to-delivery process was handled by the chimney model, mainly to secure deliveries when demand increased. The model regulated variability in long-term agreements with suppliers and it was based on forecast quality. It had shown that more coordination reduced the need of stocks. The model cleared material by a procedure and indirectly also regulated the forecast/order transformation as flexibility was limited. Its implementation simplified planning as it became integrated as a rule in information systems. Its exceptions were handled by manual controls and negotiations, which are costly. Forecast deviations led to exceptions. Many changes in orders created a short order queue (typical of low-sales periods) despite good sales and high costs. However, the value of the chimney model was high. An evaluation of alternative costs was based partly on stocks (about five euro extra per car),

partly on cost because of a lower contribution margin of hundreds of millions SEK. Thus, reduced flexibility severely affected profit.

Owner effects

Ford was influential in Volvo Cars' orientation. Ford's purchase of Volvo Cars had explicit and implicit implications for the daily work. Ford experienced a financial crisis while Volvo's results were very positive. In the takeover process synergies became an important goal. One example already explained involved the purchasing collaboration between Ford Europe and Volvo; much was purchased in common and integrated. Right costs were key. In the post-merger process projects were initiated, for example, regarding a common material planning system. In this case, Ford wanted to integrate by implementing the same IT system in both organisations. According to Volvo's project leader, they learned that much of the functions in Ford's system would be beneficial for Volvo but also that they had needs that could not be satisfied, such as flexibility. How to handle flexibility and related system functions was not an issue in the Ford sphere. Project activities included visits to Ford in Europe and Ford in the USA and participation by many people from the own organisation, from sister organisations and consultants in discussions. Volvo people learned about Ford's working procedures, routines and evaluations of what was good and bad but decided not to coordinate the system use. The systems were kept apart but the project resulted in increased costs and in inhibited development of what was Volvo-ish.

Similarly, some argued that Ford was responsible for enforcing costs and volume growth through management by objectives in an unfavourable way for co-development with suppliers and customers. One example was the production network of engine suppliers that became extremely focused on lean production. Dual supply decreased the adaptation between the engine supply and consumption because Volvo's needs and Ford's needs were different in volume, objectives and need of flexibility. The routine of using the chimney model was changed and the objectives switched; Volvo Manufacturing wanted flexibility and low costs while Ford had no intention to pay more for flexibility. Volvo Cars' engine supplier had to decrease their achieved flexibility while Ford's engine plant in Valencia had to adapt to frequent changes based on their low-cost position.

The Ford way of doing business was influential because they became authoritative as owner and by their size. In that line of argument, their goals were important, and Volvo's goals and development projects became aligned and so did their daily activities. For example, before the engine supplier became a part of the engine supplier network, the main customer was Volvo Cars and changes involved different engines rather than the basic volume. Such change was challenging for the engine plant's internal flexibility but over the years they had aligned their production with demands, for example, by utilisation of

stocks, extra transports and multi-skilled employees who could move between different engine types. They became experts in utilising existing capacity and collaborated with an external staffing agency to expand their workforce when needed. An objective that Ford enforced was production efficiency; in the negotiations about the chimney model Ford's view was "why can't you decide what to produce?" and in the objectives directed to the engine plants, headcount was seen as most important. At first, the headcount emphasised and enforced the development of the advanced capacity work. But the introduction of the production network, despite the limited chimney model and lower demands on flexibility, undermined further development. If some variants were supplied by, for example, the Valencia plant, then a change in orders had consequences for the variation in volume. In the end, Volvo Cars bought only 50 per cent of their production.

Both Volvo Cars and Ford bought from the production network, and when they made changes in production in relation to their planning, i.e., not necessarily related to any real changes in market demand, the volumes might drop or increase by 30 to 40 per cent of the total volume. The consequences were that the chimney rules decreased, the flexibility demands and the internal flexibility of the Volvo Cars engine plant shifted; production efficiency, however, was without any appreciable difference. When it came to COP, the responsible at Volvo Cars Engine noted Ford's focus on numbers of employees; the use of headcount was a major issue in order to develop. Their production rate, volume and people were interdependent in the working of the plant. Because the volume was fixed by the customer and the number of employees was decided by the owner, the rate remained as a variable. In order to manage the ordered volume with the available people, the planners needed to continuously hold back the normal rate and use overtime and work during weekends. The headcount objective was based on all of Ford's plants rather than the situational need of the plant and its results, which obstructed the planning and caused increased costs. The managers experienced that they had basically no influence on that objective. Other objectives existed but were more loosely controlled.

Long-term and short-term effects

The pressure of selling more and the acceptance of uncertainty in the matching of supply and demand create challenges for strategic COP action. Especially customer orientation, volume orientation, projects and teamwork and cost-effective goals have been elaborated on in terms of their effects on different parts of the supply chain.

As long as demand was rising, locate-to-order cars were easy to sell, particularly because of increasing delivery times of fully customised cars. The manipulated COP resulted in less coordination of sales and demand, customer orientation was distorted, and the order-to-delivery process changed in spite of

the fact that the principle of customer order initiated production was prevailing and separated from Ford's customised configurations of packages.

However, preconditions changed. Volvo's and Ford's business logics were perceived as fundamentally different. Despite that, as an example, a top management decision to purchase engines neglected the Volvo chimney model for flexibility and a new model was negotiated among the parties and introduced to both Ford and Volvo, reducing possible flexibility and increasing the price, which affected Volvo's customer responsive process by less flexibility and Ford's lean process by increased flexibility costs. Thus, despite Ford's and Volvo's different business logics they changed into a uniform direction through common practices.

The case of change in flexibility was triggered by a change in purchasing policy. A Ford plant was pre-destined as a supplier and the parties had to agree. Volvo's demands on the supplier became strange as it was a customer-supplier relation but in this case the demands were treated as odd views from a smaller partner in an alliance. Nevertheless, the option decided upon was the least painful alternative for all parties. Volvo's management agreed to pay more per engine and decrease flexibility demands. About 90 per cent of Volvo's orders would be included in the changed flexibility model and the routines in the order process were maintained. To the Volvo plant the lower demands on flexibility implied that a simpler method of production was possible, and the multi-skilled workforce was reduced. Despite the lower demands, variations in total volume were expensive because of increased inventory costs and inbound transports. Thus, the change implied a lower possibility to handle variability. The purchasing policy resulted in swings in volume instead of variants and their related costs. The costs related to maintaining flexibility together with a search for synergies in production, and implications were seen to be underappreciated and outside the agenda. Functional synergies could be difficult to make sense of in the different firms' business processes. The rationales of Ford's and Volvo's business logics were seen as difficult to integrate. The difference in business logics referred to objectives and how sales were managed, how orders were managed, how production was planned and executed and how stocks, extra capacity and resources were used.

Chapter 8 - Analysis of COP principles

The empirical chapters situate COP in a strategic development. The development is described as having different paths that converge and diverge, and the empirical chapters end in a description of effects of the development. In this first analytical chapter, I will scrutinise the principles of COP from literature and compare these to findings. The principles are the ostensive definitions that are well known as reference points for many studies of supply chain strategies and related logistics practices. Despite analytical precision and the normative advice, the relevance has been questioned in studies of practice as well as validity questions of integration in SCM. Customer-oriented strategies are conceptual artefacts of importance to the knowledgeability among practitioners and students of the subject and therefore it makes sense to take off from this position even though it will be developed in the subsequent chapters.

The COP artefact

The starting point for this elaboration of principles is the theoretical pre-understanding related to supply chain strategies (see Table 3.3). Social concepts are conceived as causes of social action in order to find rationality for the social system. However, an ostensive definition of COP could only be loosely defined in relation to development, based on the literature (in line with Cerruti 2010). Therefore, this is an endeavour into an explanation of principles based on the concern of the conventional ostensive definition with what customer-oriented strategies essentially are. Several of the components in Table 3.3 that make up the ostensive definition of COP are of an abstract character while others are of a concrete character denoting strategic activities.

The conceptual components (abstract and concrete) of customer-oriented strategies will be scrutinised. First, components that are of an abstract character: standardisation/customisation, customer orientation, integration and responsiveness are discussed (Table 8.1). Then, components of a concrete character: operational logistics, outsourcing of activities, IT support, inventory, modularisation, option bundling, mutability, postponement and routines in the order fulfilment process for customised products (exchange and adaptation) will be analysed (Table 8.2). Finally, on the basis of implications of the analysis, the value of principles is summarised.

Abstract components related to customer-oriented strategies

Standardisation/customisation

The standardisation/customisation continuum is based on distinct strategies in a given value chain in which customer service, manufacturing service and inventory investment are predetermined (Lampel and Mintzberg 1996; Olhager 2003). However, the case showed that value chains change in structure in relation to customer choices. Some choices made by the customer require supply from a supplier that is situated far away, which interferes with the classification of consistent strategies. Customer heterogeneity and demands based on the heterogeneity emphasise the importance of a coordinative rather than a distinct value chain. Parts of value chains change independently of the other parts; different suppliers, for example, are used. Or the suppliers' customers change their individual demands back and forth over time only with reference to their needs. The flexibility that Volvo Cars' engine supplier had developed over the years was changed with the additional customer's new sets of demands.

Traditionally, the customer order decoupling point, CODP, denotes what part of a supply chain produces based on forecasts and what part produces based on customer orders, which becomes the basis of directions regarding appropriate strategy. The CODP is based on customer orders, which relieves the manufacturer of the risk of speculation, but this does not mean that the product will be more customised. For example, the engine plant receives customer orders and produces individual engines, but these are customised in the next tier at the sequence centre. Thus, the extension of standardisation in a given value chain is not necessarily related to the CODP. Based on commonality, supply network design and option bundling, several standardised supply chains perform the customisation.

The case gave insight into an interesting anomaly, the quick seller, related to customer orientation. Mass customisation is an industrial response to customer orientation. However, the customer-unique value involves more than physical customisation (Gilmore and Pine II 1997; Rudberg and Wikner 2004), and customer orientation was the predominant primary objective in car supply chain development. Most of the ongoing development process aimed at some aspect of increased customer value. COP initially prompted an instrumental customer orientation by responding to daily orders. The volume orientation plan was decisive. Particularly, this was seen in the proposition of how growth would be accomplished by the person primarily responsible for sales and service, the vice president, which was surprising. No reference points were made to customers or customer value but to markets, segments, benefits of scale, annual production and costs. Also, the decreased degree of COP related to lower customer satisfaction that harmed brand image and reduced the financial result. Thus, volume orientation might harm customer satisfaction; however, increased volume was a prerequisite for the possibility to frequently

launch new products and thus be customer oriented. Customer satisfaction was an objective for most brands. Premium brands, such as Volvo, needed in addition the customer orientation that COP provides in the sales situation and in sales service. However, also other brands were moving into a BTO direction "*to reduce stock, shorten lead time and for competitive advantage"* as proposed by the director of Volvo's material planning and logistics in 2006. Volvo Cars found a proportional correlation between the stock of different markets, as percentage of sales, and BTO rate. For example, in the Nordic region the BTO rate was 79 per cent and the stock was 6 per cent of sales but in a market with 40 per cent BTO rate, the stock of sales was 17 per cent. A high stock tends to delay new introductions of products until the stock is sold out.

The BTO approach in the supply chain was supplemented by a sales approach, which engaged in a dialogue with individual customers to help them articulate their needs. The dealers acted as collaborative customisers in order to facilitate for customers to articulate what they wanted instead of growing frustrated when forced to select from a plethora of options (Gilmore and Pine II 1997). The dealers facilitated by identifying the precise offering and making customised products. The sales logic is customer-driven instead of focusing on homogeneous markets and average offerings. Car customers, especially of premium brands that offer an abundance of innovative extras, have to make one-time decisions based on difficult and multidimensional trade-offs. The customers' either/or sacrifice gap built into the one-time decision might be bridged by dealers that work directly with individual customers to jointly determine the customised requirements. IT representation of the customisation process of the car permitted customers to participate in the design stage and play with the possibilities available to them. The collaborative sales situation assisted the customer in finding out the ideal, exclusive car that they would not otherwise have identified. In addition, the customer knows when their car is manufactured, and the delivery is predetermined. Thus, standardisation/customisation is a coordinative and dynamic choice rather than something built in the supply chain (Table 8.1).

Customer-oriented customisation

Building to order, customisation and responsiveness did not exclude forecasting, which actually played a major role. People involved in marketing and sales of Volvo observed behaviours over time to learn about predictable preferences by knowledge about customers in line with what Gilmore and Pine II (1997) would denote transparent customisers. Transparent customisers change the product for customers without showing that the product has been customised, and the marketing and sales people customised cars for specific markets and according to trends. However, they also introduced the quick seller, which is based on a standard package into which customised features were placed. In general, it is meant for customers who want to avoid collaboration as proposed by Gilmore and Pine II (1997). The quick seller was

"an offer you can't afford to miss" with a standard content and a customised and discounted package of features. It was production-driven rather than customer-driven. Transparent customisation is the precise opposite of cosmetic customisation, as the quick seller could be categorised with its standard content and customised package. Another example of cosmetic customisation was the after-sales service of Volvo Cars. At this point, customers avoid collaboration as they want to be bothered as little as possible by the interruption of car usage. After sales is based on a standard offer and consequently appropriate for cosmetic customisation (Gilmore and Pine II 1997). The car owner wants a service or a repair and, basically, the standard service satisfies the customer. The extended services offered for the Volvo owner replaces time-consuming and unappreciated encounters in the workshop with simple customised means, such as the personal technician. Another example of transparent customisation was the "COP after sales"; through IT, distribution centres and delivery routes the sales and service staff simply book the service, and the components that are likely needed will be delivered in time for the booked service. The transparent customisation of deliveries to sales and service staff acts to fulfil their needs, and in turn the customers' needs.

Gilmore and Pine II (1997) outline four ways of mass customisation (collaboration, adaptation, transparent and cosmetic), in addition to the one enabled by IT and by flexible work processes, that customise to create the greatest customer-unique value at the lowest possible cost. They argue that customers do not value dealers who recite mantras on customer service; they value – and buy – goods and services that meet their particular set of needs. Different approaches are needed in customer interaction because sometimes a dialogue with customers is needed, sometimes a customer should be observed silently, sometimes uniqueness needs to be displayed and sometimes it needs to be embedded. Often, a mix of some or all of the four approaches is needed to serve a firm's own particular set of customers, as proposed by Gilmore and Pine II (1997). The customisation firm's set of customisation capabilities might meet the singular needs of individual customers. However, in Volvo Cars' customisation, the quick-seller example of customisation seemed to counteract other types of customisation. The degree of customisation is discussed in relation to modularity (Duray 1997), but the relation to strategic development is of further importance, especially in cases where different ways to customise counteract each other. Thus, customer orientation is an open element as it is influenced by different means, often interrelated, such as the BTO rate, collaborating dealers, modes of non-physical customisation and after-sales service (Table 8.1).

Integration

Integration is often discussed in logistics and SCM literature because it is a fundamental prerequisite of all kinds of advantages and it is described as rhetoric rather than reality (Fabbe-Costes and Jahre 2007; Fawcett and Magnan

2002). All relationships involve adaptation, while supply chain integration is situational and involves different functions and processes together with enabling technologies and organisational alignment. Instead of treating the concept as either a certain degree of material flow integration, information flow integration or financial flow integration, Hertz (1992) opened up for integration as a process in which different integrative activities are interrelated. EDI was a major investment that was continuously developed in scope of suppliers participating and in depth of information. Technology is an obvious cost but also training of responsible staff in different coordinating organisations was costly. These are examples of investments with a strategic importance to results (Easton 1992). Thus power becomes an issue.

Power was experienced by suppliers who on the one hand were motivated to engage in the automotive industry as it challenged them to improve and on the other hand were discouraged because some autonomy disappeared as they needed to comply with the sometimes inconsistent demands of buyers. Also, people at Volvo experienced power in business partner relations. They were dependent on sales people and on the suppliers, and as individuals they were facing the great complexity and dynamics of making a difference for the better. The complexity regarding interorganisational coordination was related to other decision makers and other interests that drive the integration, which might conflict with the intraorganisational decision makers' intent (Gunasekaran and Ngai 2004; Sarkis and Talluri 2004; Yusuf et al. 2004). Supplier integration increased the effectiveness and was reinforced by the fact that the interdependence increased and more coordination and integration was needed to secure the needed structure.

In line with the processual view, Bagchi et al. (2005b) describe integration as more than a unifying act. Instead, they see integration as developing with different scope and with different content over time. From a supplier's/supplier developer's point of view the tighter supplier control in terms of "being at the supplier's place, in order to make the supplier deliver" was a change in scope and in content of coordination. The supplier developer learnt about supplier problems and understood what might cause interruptions in the supply. Another example was the coordination to shorten lead times. Such increased demands and strategic initiatives required a great deal of communication and incrementally intensified involvement. However, one integrative effort led to another; shorter lead times and more frequent deliveries led to a more integrated information flow in terms of sharing of updated delivery programs. Then, it turned out that the supplier's intensified information exchange with Volvo's planning did not make sense internally at the supplier because the production relied on information that was less frequently updated. The internal control of the material flow was outside the integrative scope. Thus, in this case the content differed, that is, the information flow became more integrated than the material flow, which relied on a stock to fulfil obligations. The scope of integration in terms of who is

involved adds to the complexity of integration as a process. Basically, it is people that make integration happen. These are engaged in functions and in organisations and sometimes in interorganisational industry-wide projects. However, what is reasonable from an abstract point of view needs to be accepted in the wider group that becomes engaged. The idea of coordination needs to be agreed on, which might be easier in negotiations between autonomous organisations such as customers and suppliers who can take advantage of the power of their position than in relationships without that pressure. Thus, integration is a strategic process that fluctuates with different utterances at the business network level and the production system level. The closer coordination of production interdependencies implicates a higher degree of power guiding different and simultaneous types of investments and further coordination (Table 8.1).

Low-cost responsiveness

All supplies to Volvo Cars needed to cope with a certain amount of flexibility. However, the engine supplier owned by Ford simply refused to comply with the demanded flexibility because this was not a part of their offer. Not only the buyer and supplier became involved in the negotiations but also the other customers and suppliers in the engine supply network. Basically, the engine supplier was chosen in order to achieve synergies and a more efficient supply. The goal of flexibility in supply was overshadowed by the potential to win synergies and create an efficient supply.

An additional dimension of goal complexity was involved. Ford as an owner offered other strategic challenges as a partner in potential synergies to be made in common purchasing activities and product development as well as enforcing volume growth and efficiency in manufacturing. Responsiveness to customer demand became secondary because the BTO rate decreased. Flexibility was maintained or considered mainly in the production system; the business network with management and supporting functions tended to disregard flexibility in negotiations, in new production set up and in product development. The flexibility achieved in distribution, final assembly, fabrication of modules and components (Fredriksson 2002) is considered in the literature to constitute responsiveness (Reichhart and Holweg 2007). Responsiveness was based on flexibility in the product related to innovation, in the mix and volume of production and in the delivery to production and transports. In all, the responsiveness seen as customer orientation was closely dependent on the receptiveness to signals and knowledgeability among people involved. However, the engine supply chain illustrated that shifting one type of flexibility to another was difficult as both structure and way of thinking were built for mix flexibility rather than the enforced volume flexibility. In every relationship of a supply chain system, the supply chain has a potential of what it can do and a demonstrated responsiveness of what it does. Only when these are aligned can

a responsive supply chain be created that is also cost-efficient (Reichhart and Holweg 2007).

Thus, the potential and demonstrated responsiveness shifted dynamically because of goal complexity. Demonstrated flexibility in mix had to turn into volume flexibility. Means to achieve different types of flexibility vary. The responsiveness to customer requirements is in product (innovation), in production (mix and volume), and in delivery (production and transports). In all cases, responsiveness is closely dependent on the receptiveness to signals and knowledgeability among people involved. Shifting one type of flexibility to another seems to be difficult as both structure and way of thinking are built for mix flexibility (Table 8.1).

Table 8.1 Abstract conceptual components of the COP artefact

Elements	**Conceptual properties**	**Implications for developing customer-based strategy**
Standardisation customisation	Business logic(s). Non-physical and physical. Long- vs. short-term adaptation.	A coordinative and dynamic choice rather than built in the supply chain.
Customer orientation	Towards individual customisation but under the influence of mass customisation principles. In the offer vs. in the future (development). A variant handling option.	Customer orientation is an open element as it is influenced by different means, often interrelated, e.g., the BTO rate, collaborating dealers, modes of non-physical customisation, after-sales service.
Integration	Strategic decisions and negotiations within firms, involving functions such as market, planning and purchasing, and across firms, involving dealers, sales companies, logistics firms, OEM assembler and suppliers. Hard and soft investments.	Integration is a strategic process that fluctuates with different utterances at the business network level and the production system level. The closer coordination of production interdependencies implicates a higher degree of power guiding different and simultaneous types of investments and further coordination.

Responsiveness	The speed with which the supply chain can adjust product, mix, volume and delivery flexibility in a cost-effective manner based on customer requirements; might be potential or demonstrated. Is achieved in situations of, e.g., outsourcing, information technology, postponement, modularisation and customisation in product design, in production, in delivery or in use, buffering through inventory or by separation of product flows.	Because of goal complexity, the potential and demonstrated responsiveness shift dynamically. Demonstrated flexibility in mix had to turn into volume flexibility. Means to achieve different types of flexibility vary. The responsiveness to customer requirements is in product (innovation), in production (mix and volume), and in delivery (production and transports). In all cases, responsiveness is closely dependent on the receptiveness to signals and knowledgeability among people involved. Shifting one type of flexibility to another seems to be difficult as both structure and way of thinking are built for mix flexibility.

The implications seen in Table 8.1 of abstract components of the COP artefact are rarely discussed in literature. First, implications for supply chain categorisation are that a given supply chain building complex products to order develops by coordination and dynamic choices into different degrees of standardisation and customisation. Second, customer orientation is a fluid and open concept and thereby easily influenced by various interrelated means such as BTO rate, collaborating dealers, modes of non-physical customisation and after-sales service. Third, integration is a strategic process that fluctuates with different utterances at the business network level and the production system level. Coordination of production interdependencies implicates a higher degree of power guiding different and simultaneous types of investments and further coordination.

In this case, goal complexity shifted the potential and demonstrated responsiveness. It was troublesome to turn demonstrated mix flexibility into volume flexibility and the change required additional resources while no substantial benefits were visible. Shifting one type of flexibility to another seemed to be difficult as both structure and way of thinking were built for mix flexibility. Fourth, responsiveness to customer requirements was, in the product, related to innovation, in mix and volume related to production, and in delivery related to production and transports. In all, responsiveness was high and dependent on the receptiveness to signals and knowledgeability among people involved.

The division of conceptual components into abstract and concrete characteristics related to customer-oriented strategies is for analytical reasons only. This becomes obvious in the results, where the conceptual characteristics

will purposely be brought together again. However, before that, the concrete characters of customer-oriented strategies will be analysed.

Concrete components related to customer-oriented strategies

Operational logistics

In operational logistics the CODP is of major importance to manufacturing strategies. Rudberg and Wikner (2004) argue that CODP, defined as the point in the value-adding material flow that separates decisions made under uncertainty from decisions made under certainty concerning customer demand, is normally only used for production- and distribution-related activities. Rudberg and Wikner show how the engineering resources can be integrated with the production process so as to take the features of mass customisation environments into account. However, in Volvo Cars' COP manufacturing-related development processes improved variables related to the CODP, such as lead times and inventories, and cross-functional engineering development projects, such as use of system suppliers for modules and platform engineering. But the CODP only affects the production system. Sales were influenced by planners' dependence on the production system but otherwise unrelated to this. Thus, the back-end mass customisation that is fixed by high investments in fixed assets will be facilitated or hindered by front-end mass customisation. In the whole value chain, it is thus not the CODP that affects the results of mass customisation but the combined effects of mass customisation. When it came to the development of COP, effects of postponed value-added activities grew together with outsourcing to system suppliers and improved use of IT, but those effects were at best when combined with the collaborative customisation approach of the marketing and sales people. Implications of operational logistics for the development of COP relate to the fact that the meaning of responsiveness is related to the production system and its limitations.

Interdependencies and changes in activities

Outsourcing, modularisation, mutability and postponement are activities that simplify handling of interdependencies in the material flow together with supporting IT in order to facilitate COP. In line with Duray's (2002) discussion of degree of customisation, Volvo Cars' BTO strategy corresponded to Duray's type as a mass standard that involves the customer in the assembly process and bases its product variety on combinations of modules that are assembled into various products. In Duray's comparison of different types of mass customisers none in particular stood out as a high performer. This is understandable in the light of the development of COP. Basically, all practices mentioned in literature as prerequisites to BTO are taken on by knowledgeable people in the production system, that is, modules, mutability with commonality among components, late configuration and option bundling. However, a micro view of the application of these shows that they are used in different ways. For

example, outsourcing to a system supplier that is situated nearby and that coordinates with the next one in the value chain has other implications than outsourcing to a supplier that is less coordinated because of longer distance or difficulties in communication, etc. The same logic applies to mutability; if standardisation of parts facilitates coordination, then mass customisation is facilitated, but if commonalities are combined with taking advantage of, e.g., Ford's use of components and their purchase volumes, then coordination in relation to the "own" value chain decreases and so do benefits of mass customisation.

Hijacked use of inventory, options and routines

Lean and agile supply chain practices were seen to support continued development rather than being opposite approaches. The importance of each shifted but they were not replaced. However, some practices tended to have implications for one and/or the other. For example, the objectives of volume growth and ensuing actions resulted in stocks and a lower BTO rate. It might be seen as if some objectives are able to hijack existing practices into another direction. However, the COP implementation revealed that lead-time focus, process management, more teamwork and collaboration as well as customer-driven activities tended to support both lean and agile ambitions. This is in line with Christopher et al. (2006), arguing that the selection and integration of appropriate aspects of lean and agile make the particular supply chain strategy appropriate in terms of being aligned to market demands with reduced waste.

Basically, the car supply network is seen as an extreme, characterised by unpredictable demand and long lead times. The ideal solution in that situation is by postponement (Christopher et al. 2006) that reduces the stock-keeping risk but requires detailed coordination of the activities involved (Alderson 1950), a strategic inventory in some generic form, and assembling/configuring/distributing as required when actual demand is encountered. However, as is illustrated in the case, a supply chain setup cannot respond to emergent situations that increase the gap between potential and demonstrated responsiveness because of changes in objectives. Quite contrary is the concept of an emergent supply chain strategy (Sebastiao and Golicic 2008) that adapts to efficiency, responsiveness or agility as the situation changes. The supply chain emerges during successive interactions with the market, and the supply chain strategy adopted must provide the flexibility to be modified. In Sebastiao and Golicic's case, the concept of emergent supply chain strategy embraces a situation of low degree of market structure, low degree of supply stability and low degree of demand predictability. The market structure changes the situation and includes dynamics. In the COP case the situation changed and similar dynamics were seen. Sebastiao and Golicic (2008) emphasised the role of a core group of supply chain partners, complementary product and service providers and customers to develop the strategy. Other examples of emergent influences from literature are dynamic supply trade-offs (Stratton and Warburton 2006;

Stratton and Warburton 2003), meta-routines and other routines for mindfulness (Adler et al. 1999) and negotiated production programmes (Holweg 2003).

The frequent changes in orders from Volvo dealers created problems to the supply chain, in line with Reichhart and Holweg (2007) arguing that the impact of schedule instability on supply chains is very significant and is regarded as a primary cost driver in supply chains. The case illustrated that the routines of COP aimed to minimise instability by using frozen horizons and the chimney model that regulated the instability (in line with Reichhart and Holweg 2007). The routines were used for another purpose. Otherwise, the most common way to cope with unpredictable changes in orders is to increase stock levels (Reichhart and Holweg 2007). Christopher et al. (2006) discuss the use of stock levels to achieve responsiveness together with off-shore sourcing, and in such a case the stock levels are a trade-off against lower costs. The inventories were used for another purpose. Also inventories related to the frequent changes of orders driven by the objective to increase volumes. This might be abstracted to say that the structure and business processes seem to have persisted change, while the management components changed and influenced outcomes because of dynamic dependencies among them (Cooper, Lambert and Pagh 1997; Dubois, Hulthén and Pedersen 2004). Thus, inventory, option bundling and routines are used for coordination and are possible to hijack.

Table 8.2 Concrete conceptual components of the COP artefact

	Conceptual properties	**Implications for developing customer-based strategy**
Operational logistics	Planning and managing operational and collaborative activities in a customer-oriented pull system. Exchange interactions, such as social, business and information exchange. Adaptation interactions, such as product, production and routines adaptations.	Operational routine decisions of strategic compromises. COP initially developed with cumulative and later with interchangeable manufacturing goals with an increased complexity. Goal complexity grew with the situation. The meaning of responsiveness was developed at the production system level.
Outsourcing of activities	Specialisation and increased interdependence. Flows of products managed as stable base vs. surge demand (early/late, a parallel flexible/inflexible flow).	Outsourcing related to modules facilitated COP, while outsourcing for cost reasons tended to increase complexity and reduce responsiveness.

Supporting IT	Glue for specialised actors and interdependent activities.	Conditions to implement a BTO strategy. Over time, the content changes and the components are used to accomplish other types of ends, such as efficiency calculated in costs.
Modularisation	Blocks for assembly to orders.	
Mutability	Standardisation of parts in modules.	
Postponement	Late configuration based on customer orders.	
Inventory	Used to decouple agile part of supply chain from lean part.	Used to cope with changes in the situation.
Option bundling	Using modules with predefined combinatorial possibilities.	A routine to create quick sellers.
Routines in order fulfilment process	Frozen horizons, quantity/flexibility contract, postponement and modularisation.	Type and content of practice influence results in relation to multiple tasks and objectives (exchange and adaptation).

The implications of Table 8.2 are that concrete conceptual components of COP, such as operational logistics, outsourcing, IT, modularisation, mutability, postponement, use of inventory, option bundling and routines in order fulfilment process, can change in meaning in relation to prescriptions in the literature.

The operational logistics compromises were standard procedures with decisions that were often operational regarding acceptance of changes in orders, but sometimes, if the implications of the change were crucial to the supplier, the issue escalated to a business level where costs were renegotiated. Goal complexity was added as manufacturing was compared with other types of plants that could not achieve the degree of customisation that they did. COP initially grew with cumulative manufacturing goals; flexibility and delivery precision were added to lean production and developed into interchangeable goals when the importance of costs grew again, which increased complexity. The goals evolved with the situation. The insight into the meaning of responsiveness was developed at the production system level, and implications of trade-offs also derived there. Inventory was used in different combinations beyond the CODP inventory to cope with changes in the situation. Mason-Jones et al. (2000b) indicate that in lean production, the customer buys specific products, such as quick sellers, whereas in agile production the customer reserves capacity that may need to be made available at very short notice. COP of Volvo Cars is not a leagile approach in line with the literature; there is, for instance, no clear distinction between lean upstream and agile downstream divided by the CODP (Christopher and Towill 2000; Krishnamurthy and Yauch 2007) and no separating of flows for cost reasons (Stratton and Warburton 2003). Instead, Goldsby et al. (2006) put forward that lean and agile philosophies are founded on simple premises – the complexity becomes

apparent during implementation; they have a common objective of meeting customer demands at the lowest total cost and can be merged in a variety of ways to create leagile approaches, in which business-specific conflicts need to be defined through data analysis and dialogue (Stratton and Warburton 2003). Basically, outsourcing that related to the module approach facilitated COP, while outsourcing for cost reasons tended to increase complexity and diminish responsiveness. Outsourcing to low-cost countries was not specifically arranged in order to preserve leagility.

IT support, modularisation, mutability and postponement improved COP performance and were more or less needed to implement a BTO strategy. Over time, COP content changed and was used to accomplish other types of ends, such as efficiency, measured in costs and quality. Similarly, option bundling became a routine to create quick sellers, in addition to the use of modules to create predefined combinatorial possibilities.

Routines in the order fulfilment process for customised products are discussed in the literature, such as the quantity-flexibility contract (Reichhart and Holweg 2007). Implications from the study with regard to the chimney model demonstrated that it was developed as a solution to a problem such as "how can supply be secured when our demand varies based on customer orders?". The implication was that flexibility must be bought. This type of practice, the chimney model, supported COP. However, multiple tasks and objectives that evolved over time changed the input to the model and thereby also the content, which influenced the results. The underlying exchange interaction was of the same type and content but the daily use of the routine was adapted.

Principles

Principles of supply chain strategies are most often only loosely defined in literature in relation to strategic development. Basically, there is no reason for that beyond the researchers' aim to create robust explanations. Inclusion of dynamics and complexity interferes with the categorisations made but also takes seriously the development that will eventually take place beyond the planning of a new strategy. Customer-oriented strategies are a conceptual artefact often explained by the characteristics discussed in this analytical chapter, which are seen as reasons to find a customer-oriented rationality in the system.

The lack of social elements in the build-to-order literature, such as how supply chain people design, control and implement a build-to-order strategy, together with the knowledge gap of the dynamics and complexity involved in the trade-off between responsiveness and the cost of logistics (Gunasekaran and Ngai 2005) can hardly be explained by principles. In this chapter, components of COP were characterised as conceptual or concrete. Conceptual components are of a kind that are abstract and relate to a bundle of activities

that are otherwise loosely coordinated. Rules and resources available for conceptual components are unclear. The concrete components have a responsible decision maker who can account for goals and activities. They might be instrumental and defined as working procedures in terms of rules and resources and work patterns. Once the concrete components are at work in the daily nitty-gritty, they gain less focus and easily drift to accomplish complementary and conflicting goals, which is important when it comes to strategic development. What happens depends on simultaneous happening in other characteristics of the artefact. Thus, the artefact is fluid in situation of time and place.

Chapter 9 - Analysis of COP practice

The previous chapter of analysis of principles is in contrast to this chapter. The principles of COP could not sufficiently explain the converging and diverging paths of COP development and the effects of the development. Therefore, patterns and effects from the experienced performance are interpreted as a complementary explanation. The basis of this analysis is the practice lens for understanding and conceptualisation. Such an analysis includes development not only in terms of change, but also in terms of stabilising actions, complexity and dynamics related to COP.

Development of COP in practice

Basically, COP comprises beliefs, actions and routines. The existence of COP is in the present and a perception of its history and future. The COP artefact had a set of properties crafted by researchers, discourse in Volvo Cars, initial guidelines in the implementation and development over time. By contracts, routines and situation, users knew how to interact with it. The usage was changed by peoples' intent or error. This happening, COP in use, will be elaborated first in this chapter.

The artefact changed by being in a new context, for example, by being enlarged by another concept. In the preceding chapter the COP concept was analysed. Such a concept is explained by ostensive principles in order to motivate and prescribe an improved performance. Both the literature-based principles and the additional insights were used to write up a specific situation of what is and how it has developed. In order to understand the happening, the dynamics in use gives new meaning and is important to understand, together with how the physical properties of the artefact defined use (Orlikowski 2000; Orlikowski et al. 1995). Orlikowski (2000) argues that dynamics is regulated if the artefact is standardised, interconnected and interdependent, which is in line with Law (2007). Thus, COP included standardised routines and highly interconnected and interdependent actions in the supply chain. Actually the supply chain practices, the chimney model and frozen horizons, worked to regulate dynamics. In addition, COP involved both strategic durability as part of an industrial trend towards customisation and discursive stability because it was a distinct strategy that Volvo Cars held on to (Law 2007). However its

durability was weakened by its dependence on face-to-face interaction (Law 2007).

COP in practice will be analysed based on Orlikowski's (2000) substantiation of Giddens's (1979; 1984) thesis of the duality of structure. Orlikowski applies Giddens's structuration theory for a deeper understanding of the constitutive role of social practices in enacting technology in practice (the software Notes) but is specific about the fact that technology in practice also involves concepts in practice, such as COP in practice. Therefore, the following analysis, COP in use, is an extension of Orlikowski's application. It is a situational analysis taking different supply chain actors into account. In line with the outcome of Orlikowski's (2000) study of the development of Notes in use, conditions, actions and consequences of types of enactment will be substantiated in relation to the analysed actors. After COP in use, the enacted order fulfilment process is discussed and types of enactment will be further explored on the basis of their bearing on strategic development. Enactment does not necessarily mean change, which is a finding by Orlikowski (2000), but stability is more elaborated upon by Feldman and Pentland (2003) and explained by Giddens (1984), which I use in the subsequent section on mindful stability. Finally, the chapter is closed by a performative explanation of COP, "The artefact in recurrent situated practices – change and stability". Thus, the whole endeavour is to explain the development of performance (Figure 3.8, the proposed weaving-together study) and what is actually done with the artefact in people's recurrent situated practices.

COP in use

COP in use is situated along a line of actions performed by, among others, the customer, the dealer, the market function, the supply chain and the chimney model, as will follow. Each actor has a set of structures, and strategic development was illustrated in Chapter 7 and is next analysed in its interaction, as is illustrated by Figures 9.1-9.5 (adaptations of Figure 3.7) and explained in relation to each. In line with Orlikowski, I elaborate on the notion of COP in practice, the particular structures of COP use that users enact when engaging recurrently with COP. Consequently, the other structures enacted at the same time will not be as central here. In any structurational analysis, one must foreground some structures and background others (Giddens 1979). All structures are continually enacted through actors' recurrent practices. In line with Orlikowski (2000:411), I have chosen to focus on the particular structures of COP use. Actors draw recurrently on both COP in practice and other structures that have been previously enacted, and such action remakes the structures, either deliberately or, unintendedly, by reinforcement, in which actors enact the structures with no noticeable changes, or by transformation, in which actors enact changed structures; the changes may range from modest to

substantial. The types of enactment are consequential to the development and are affected by situational conditions.

Customer

The customer that draws on COP does it in at least two different eras of COP as equal to customer orientation and of COP parallel to customer orientation and profitable volume growth. Customer action is depicted in the duality of structure in Figure 9.1, in which facilities belonging to the customer are the right of decision to buy and the own evaluation of an offer. Customer norms sanction a line of actions, and regarding cars, buying norms relate to premium as exclusive and customised, premium experience, and perceived as a good common choice and, in addition, good for personal reasons. The interpretative scheme is the reflexive communication by the customer that in its action communicates that media and public opinion decide what is common good together with an openness to learn either in collaboration with the dealer or in collaboration with other car buyers through the internet regarding the purchase of the car and the car ownership.

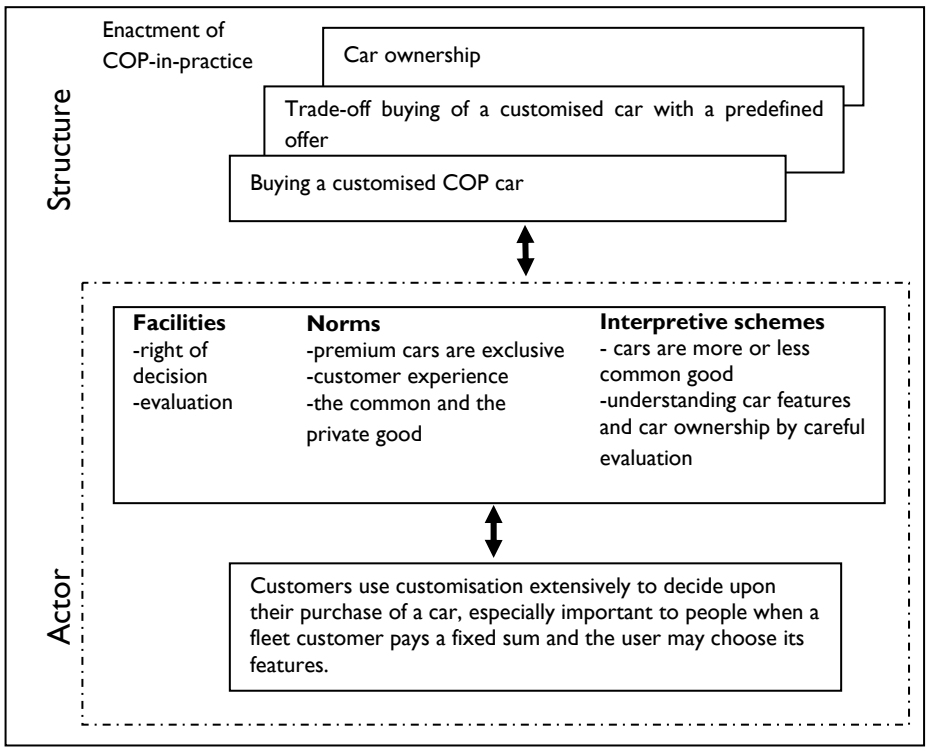


Figure 9.1 Customer duality of structure. Source: Adapted from Orlikowski's Figure 2 (2000:410).

The structure "Buying a customised COP car" is in the foreground in the customer enactment of COP-in-practice. The structures of rules and resources instantiated in the COP buying situation are parallel to customers' trade-off buying and to buying into a relation of the car ownership. The possibility to buy a customised car is based on the assumption that customer satisfaction derives from experiences that might be co-created and on trust in the sales model and in the relationship with Volvo Cars (see Table 7.1, of COP assumptions related to the customer). In the era of customer orientation both uncertainty avoidance and customer interest facilitated the development. Uncertainty was avoided by open negotiations (costs for customisation). And the customer became interested by way of working with concepts and creative solutions, experimentation and creativity based on knowledge. In the era of customer orientation/profitable volume growth, dissatisfaction impeded COP development. The customer experience of professionalism and consistency (of Volvo Cars and their dealers) was vulnerable to changes and led to dissatisfaction.

Table 9.1 illustrates a part of the strategic development related to customer interaction with available structures. In the interaction, the different structures "Buying a customised car" and "Trade-off buying of a customised car with a predefined offer" represent two different consumption patterns. The first is predetermined by conceptual rules as appropriate to apply in the case of a premium car purchase. The second involves pure exchange. However, both are possible to combine with the car ownership structure. To the customer, customisation might be created before and after the transaction in order to create premium experience (Gilmore and Pine II 1997). As the actor and the structure interacted in different consumption patterns, COP in use became *transformed*. Evidently, the transformation from buying a collaboratively customised car to buying a transparently customised one, i.e., predefined customisation based on forecasts, was easy as the car was cheaper and less trust was needed in the sales situation than in the more committed collaborative customisation. The transformation in enactment by customers could be seen to be *substantial* because a new consumption pattern became evident which customers are likely to draw upon even if offers are changed.

Table 9.1 Development of customers' use of COP in terms of conditions, actions and consequences. Source: Adapted from Orlikowski (2000)

	Customer
Type of enactment	Change as substantial transformation.
COP in practice or the structure in foreground	Buying a customised COP car.
Interest in using COP	Strong.
Interpretative conditions	The conventional understandings of COP are related to customisation and customer value. Experiences and meanings are influenced by more than COP.
Technological conditions	The technological properties available to the users are substantially limited.
Institutional conditions	In the larger social system the norm is "customers' possibility to customise".
Processual consequences	Customers have to change their buying behaviour, for example, fleet customers who buy a promoted car with acceptable delivery time but want a customised car. This is an intended outcome of people's knowledgeable actions but results in reduced customer satisfaction.
Technological consequences	Few properties of COP are available to customers, but results of its use are. The possibility to customise exists but is of limited use. Therefore, COP as a tool is changed and the in data are changed.
Structural consequences	Customer satisfaction decreases and social norms of a car purchase change. Structural consequences are much more likely to be unintended consequences of actions.

Next, the dealer's COP in use is to be explained in its set of structures and strategic development.

Dealer

The dealer draws on COP in two eras of COP, first, equal to ordering cars based on customer orders and second, as a high degree of speculative ordering of cars. Figure 9.2 shows the duality at work in which facilities that the dealer uses in action are showrooms and IT as a sales tool for customer interaction and as a tool for communication with Volvo Cars about orders and deliveries. The car program with accessories is customer oriented and a sales resource and so are the trust in the dealer and the reputation for customer satisfaction. The norms that sanction dealer action regard the superiority of COP in selling a premium brand. But sales are also easy with a low enough price, which will create volume growth and a cost-focused negotiation. Dealers' interpretative schemes include that sales have changed and that push logic is detrimental to a

premium brand and to trust and commitment. Customer service needs to be consistent in encounters before, during and after sales.

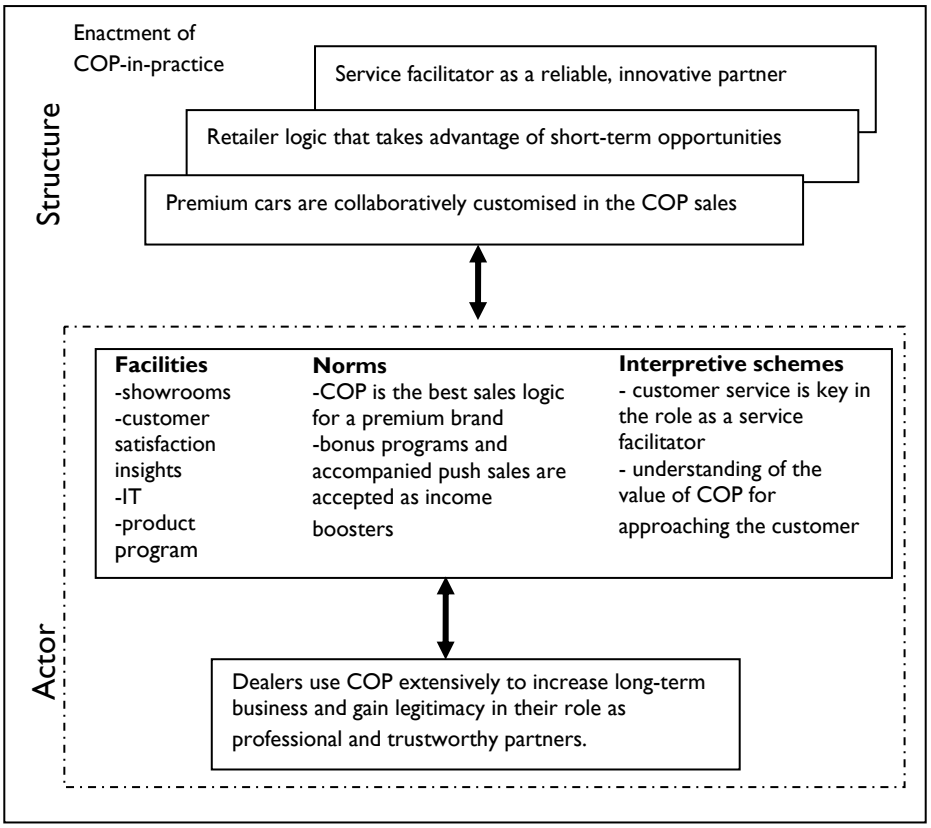


Figure 9.2 Dealer duality of structure. Source: Adapted from Orlikowski's Figure 2 (2000:410).

The foreground structure of COP action is the rule that premium cars are collaboratively customised in COP sales. This co-exists with both a sales logic of taking advantage of loopholes in the COP business model in order to achieve a bonus based on volume growth targets and promote cars by discounts, and the customer-oriented logic of being a service facilitator that is an autonomous, reliable and innovative partner.

The possibility to sell a customised car is based on the assumption that the dealer owns expert legitimacy and has professionalism in its role as a service-provider (see Table 7.1, COP assumptions related to the dealer). It relies on order-winning/order-qualifying criteria as described by Hill (1993): the winning criterion of innovative products is the provided service level, while qualifying criteria are price, quality and lead time. Otherwise, for commodities, price is the

order winner, but availability becomes a qualifier accompanied by quality and lead time. Hill argued that order winners and qualifiers are both market-specific and time-specific. They are all important criteria. As to Volvo Cars, markets far away could hardly use COP because of the long lead times. For dealers that wanted to sell customised cars, the overall service level was key; not only availability but a promoted offer that was well worth its price was an extra push. The problem was when the offers compromised the perception of service.

In the era when customer orders were the basis for ordering cars, COP was facilitated by customer service in terms of both creating and fulfilling customer wants, without the additional risk of car stocks. The service was rather grounded in trust in the offer and in experiencing showrooms and a virtual IT-enabled model of the car. Responsiveness made higher income streams possible, because customers were willing to pay for specific accessories. In the era of a high degree of speculative ordering of cars, COP was impeded by dynamics and complexity in demand/order management, which extended delivery time. Also holding back customisation, the irresistible possibilities to make profit from bonuses, etc., made the dealer an optimiser of income possibilities from Volvo Cars and income possibilities from customers.

In the interaction between agency and structure, Table 9.2, dealers experienced collaborative customisation as a part of their role of being reliable and innovative partners. As the dealers involved the complementary structure of short-term opportunities, the enacted COP in use was *substantially transformed*, despite the dealers' strong interest in using a premium car sales model. A consequence was that action became more competitive, both internally and externally. Internal competition related to sales targets and external competition to the next-door dealer with competing quick sellers (also of the Volvo brand).

Table 9.2 Development of dealers' use of COP in terms of conditions, actions and consequences. Source: Adapted from Orlikowski (2000)

	Dealer
Type of enactment	Change as substantial transformation.
COP in practice or the structure in foreground	Premium cars are collaboratively customised in the COP sales.
Interest in using COP	Very strong

Interpretative conditions	Dealers' understanding of sales and their shared meanings about a sales logic make sense in their construction of COP, customisation and customer value. COP is only interesting in terms of what it does for their sales logic, in which adaptation is important.
Technological conditions	Both the COP tool and sales data available to dealers in their work practices are basically the same although a competing sales logic emerges.
Institutional conditions	The authoritative "volume challenges" match the traditional normative social structures of car sales which are prevalent in the larger social system within which dealers work. COP sales are also institutionalised only in the niche of Volvo Cars sales.
Processual consequences	The execution, push-based sales, and the outcome, increased sales and risks, of dealers' changed work practices are an intended outcome of people's knowledgeable actions (Orlikowski 2000).
Technological consequences	COP, as a tool, is adapted in use and the in data are changed.
Structural consequences	The COP system is transformed and conforms to traditional sales logic. A dealer describes their acting in the words "we know that we act like rabbits running after a carrot, but that is part of it". The COP social norms of sales are changed.

Next, the COP in use of the market function will be explained in its set of structures and strategic development.

Market function

The market function draws on COP in at least two different eras of COP, as equal to customer orientation and in relation to volume challenges. The market function's duality of structure for action is illustrated in Figure 9.3. Facilities empowering the market function are its control of the order flow and customer knowledge. Besides the market function's extensive market analysis, it interacts and experiments at least to some degree with customers. Also, the forecast from dealers and challenges from top management are processed and transformed into a program for production. Norms of the market function that sanction interaction involve correlation of COP with the premium brand ambitions and customer orientation. However, methods are also sanctioned to push sales without customer orientation due to the norm that sales need to be pushed. The interpretative schemes communicated are that customer service and volume growth are a must and compromises might be needed.

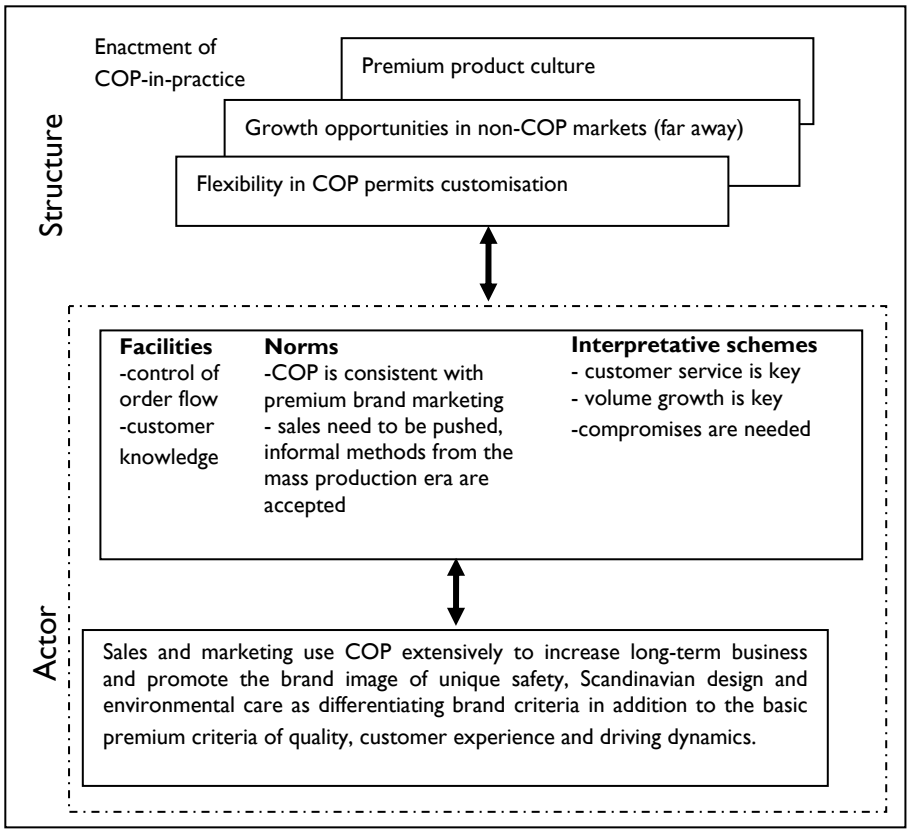


Figure 9.3 Market function duality of structure. Source: Adapted from Orlikowski's Figure 2 (2000:410).

The foreground structure implying that flexibility in COP permits customisation is enacted by the market function together with a structure that sprang out of the volume growth goal of growth opportunities in non-COP markets (far away). Yet another structure relates to premium product culture, which is a concern to maintain the premium brand that is shared with product developers, among others, and enforced by top management.

The possibility to distribute a customised car is based on the assumption that the market function has a central planning position, has at least some transparency of orders and has trust in timely supply (see Table 7.1, COP assumptions related to the market function). In an era of customer orientation, COP development is facilitated by the increased responsiveness that eliminates stocks downstream in the supply chain, which also vitalises sales. COP in terms of customer orientation results partly in positive profit growth and partly in poor volume growth and a costly resource structure (see Table 6.2). In an era of volume challenges, COP development is impeded by an industrial logic with a

focus on cost effectiveness in production, which is seen as the traditional way of how the industry works. COP in terms of volume orientation results on the one hand in boosted sales and on the other hand in a customer-disoriented sales model in which customer value and innovative features are secondary to volume-boosting lower prices (see Table 6.3). The dilemma of volume or customer orientation, in which cost-effectiveness orientation might not be a direct part but was simpler to act on, was not resolved.

The development, Table 9.3, in the interaction between the market function and the structures is in the action that is based on different structures. Basically, all actions are embedded in a premium discourse in which the continuation is a source of further actions for premium quality. This is related to innovation, basically in product development, but also to growth, in which the enactment of COP is *reinforced*. Innovative product development is based on customisation and premium quality, such as perceived by customers for growth opportunities in the USA with the XC60 products. In that interaction, premium quality matters rather than flexibility in production. Also, the market function had the intention to increase risk, in order to increase sales, which interacted with the structure of growth opportunities. The interaction between flexibility and customisation became related to the growth structure, and this resulted in more sales but decreased trust. The resulting complexity of continuous changes in orders and conflicts in relation to the supply side did not affect the intention. In action for growth, the actor was concerned about the effect of quick sellers on stock and on quality, but the customer orientation was not seen as involved in that interaction. Outcomes such as the insistence on risk behaviour and putting flexibility and customer orientation in the background mean that the enactment was *substantially transformed*.

Table 9.3 Development of the market function's use of COP in terms of conditions, actions and consequences. Source: Adapted from Orlikowski (2000)

	People in the market function
Type of enactment	Change as substantial transformation of COP.
COP in practice or the structure in foreground	Flexibility in COP permits customisation, whose rules and resources are creatively interacted in order to promote sales.
Interest in using COP	Strong.
Interpretative conditions	Market function people are in the intersection where an industrial logic supersedes the business logic because sensemaking of COP is related to stocks, transportation and production in addition to customer value. The supply chain is seen as somewhat sluggish in response to their application of necessary sales practices.
Technological conditions	Adjustments to rules of COP and changes to sales data.
Institutional conditions	The authoritative "volume challenges" match the traditional normative social structures of competitive car sales, well known by market function people. The volume target of 600,000 cars has been institutionalised and enforced by several CEOs. Customer orientation is seen as substantiated by COP at Volvo Cars, and the organisation of activities is hierarchical to promote individualistic behaviour.
Processual consequences	The offer-to-order process changes in the execution and outcome. The changed work practices are an intended outcome of market function people's actions for growth.
Technological consequences	COP as a tool is adapted in use and the in data are changed from forecasts to volume targets.
Structural consequences	The COP system is transformed and conformed to match sales based on volume challenges. The status quo of COP is transformed.

Next, the COP in use of the supply chain will be explained in its set of structures and strategic development.

Supply chain

The supply chain action in the duality of structure, Figure 9.4, is based on COP in at least two different eras, which are similar to those of the downstream echelons of the value chain that have been denoted as customer and volume orientation (see also Tables 6.2 and 6.3). These eras are related to the implementation of COP and the development that came with Ford as owner. However, in relation to the supply chain, the eras might rather be denoted as BTO and LTO in order to illustrate the enactment of building cars and locating cars to orders in the order-to-delivery process.

Facilities in the interaction are each actor's specialisation and the common coordination. Norms that sanction the interaction and legitimise the structure are possible and accomplished benefits, efficiency and effectiveness in the supply chain and each actor's professionalism. The interpretative schemes communicated are that waste is reduced together with increased customer orientation (in each tier) and that COP diminishes and handles complexity and decreases the effects of dynamics.

The foreground structure of the supply chain, integrative COP in practice, is one of many dominant structures. Other structures enacted in the supply chain use of COP are development projects and teamwork, customer-oriented product development, cost effectiveness, production-oriented Best-in-Class, and purchasing and cost-effective goals.

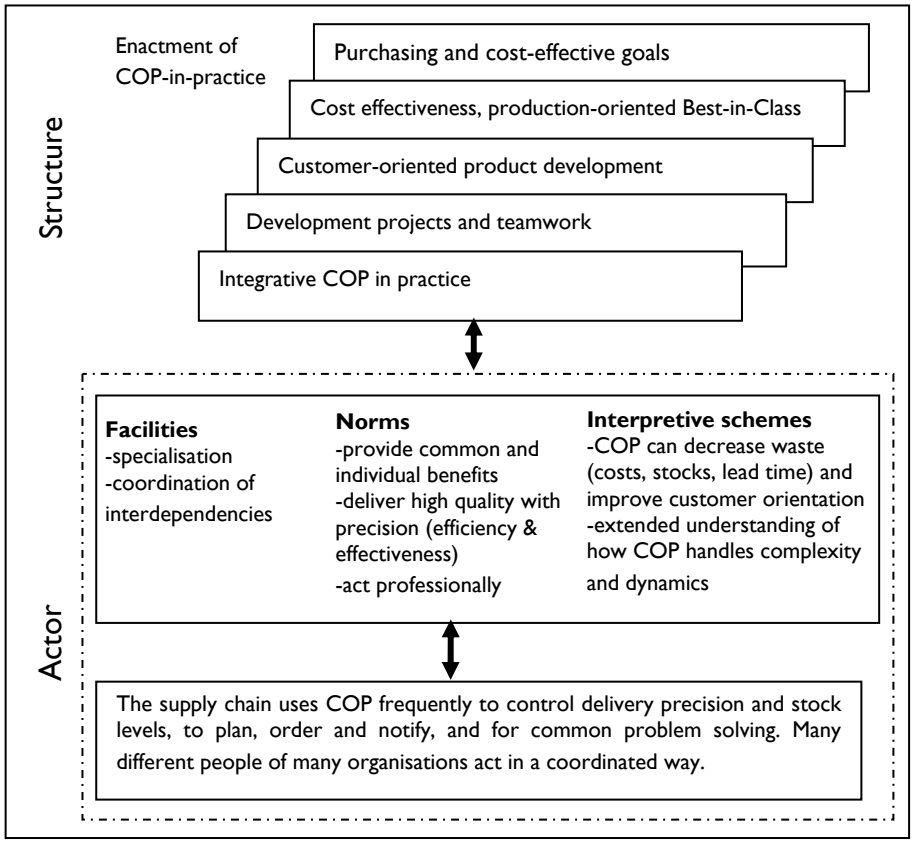


Figure 9.4 Supply chain duality of structure. Source: Adapted from Orlikowski's Figure 2 (2000:410).

The possibility for the supply chains to build and supply to customer orders is founded on the assumptions that data of customer deliveries can be trusted and that interdependencies might be handled through coordination and integration of procedures and interactions. Tighter integration also regards the use of IT and coordinated transports. Also, common learning and development are assumed to be a part of COP (Table 7.1, COP assumptions related to the supply chain). With a focus on BTO, COP development was facilitated by the reduction of lead times and delivery time through improved quality; short lead times saved costs related to, for example, less tied-up capital and a more efficient and integrated IT structure and transport structure. In addition, the interdependence facilitated a problem-oriented common development of coordination. What was remarkable was the learned capability to handle complexity, which is a differentiator to production systems that rely to a greater extent on forecasts in the production. With a focus on LTO, COP development was impeded by costs of excess capacity, dependencies of demand and supply, such as rules, procedures and knowledge that are outdated and redundant. Complexity was increased, because COP rules were applied despite the lack of customer orders. And, concurrent emergent objectives and COP interdependencies counteracted each other; see Tables 6.4-6.6.

Table 9.4 Development of the use of COP by the supply chain in terms of conditions, actions and consequences. Source: Adapted from Orlikowski (2000)

	Supply chain
Type of enactment	Application of same order fulfilment practices in new situation.
COP in practice or the structure in foreground	Integrative COP in practice with multiple converging and diverging rules and resources in concurrent structures.
Interest in using COP	Strong.
Interpretative conditions	Conventional understandings and shared meanings of the supply chain relate to complexity in supplying in which planners and logisticians acknowledge the great difficulty of shortened lead times and their benefits of lesser uncertainty. COP makes sense in their world (including the technology they use) in that an industrial logic seems to take in a business logic.
Technological conditions	Tools of contracts, the chimney model and IT are supportive and orders are based on customer demands.
Institutional conditions	The social structures (normative and authoritative) that constitute part of the larger social system within which supply chain actors work are team-focused, cooperative and learning-oriented.
Processual consequences	The order-to-delivery process hardly changes in the execution but in the outcome. The remaining work practices are an intended outcome of supply chain people's actions for flexibility. The changed situation enforces divergent ambitions in the order-to-delivery process.
Technological consequences	The technological properties of COP available to the actors are retained (use of modules, etc.) by intent even though in some instances the rules of the chimney model are changed. The changes made to data imply an adaptation of COP.
Structural consequences	The COP system is transformed and conformed to match Ford's way of handling production by enforcing costs. The status quo of COP is transformed.

In the interaction, Table 9.4, actors in the supply chain have their own ambitions and they cope with divergent demands, for example, cost cutting. Sensemaking is generated. Different possibilities emerge, such as cooperation with Ford that develops by intent and by error. For example, "production networks" were partly intended and partly developed by error in that the actors wanted common benefits rather than common restrictions. The structure of "Purchasing and cost-effective goals" led to huge deviations in demand and supply and "Cost effectiveness, production-oriented Best-in-Class" made production the centre of activities rather than the customer and sanctioned longer delivery times, among other things. These structures had been sanctioned and their enactment affected the enactment of "Integrative COP in practice". COP in practice was *reinforced* in that actors enacted the structure with no noticeable changes in their order fulfilment practices but continued to work with flexibility as had been historically done. The other structures challenged a

COP status quo and transformed consequences because actors enacted the changed structures in a range from modest to substantial changes. These structures increased value in supply chains but created suboptimisation (Table 6.6 Cost-effective development encountering COP development). The structures of "Customer-oriented product development" and "Development projects and teamwork" *converged* (see Table 6.4 and Table 6.5) with the structure in foreground, "COP in practice", in that sales were boosted, new products were launched and experiential and pragmatic learning was facilitated. The structures also *diverged* because of unsettled debates and idiosyncratic development (see Table 6.4 and Table 6.5). Next, the COP in use of the chimney model will be explained in its set of structures and strategic development.

Chimney model

The chimney model governed flexibility on the basis that coordination was needed in COP (see Table 7.1). It defined flexibility on the component level. Flexibility was problematic when demand was increasing, and for the customer as well as for the supplier, the chimney model was a frame of reference. In the action (Figure 9.5), the chimney model was a resource that facilitated COP by creating and adapting flexibility demands on suppliers by a procedure. It acted as a norm that sanctioned action by supply chain agreements. Interpretative schemes in the communication were based on the power of flexible customisation and the fact that the chimney model functioned in its role as mediator of flexibility. The foreground structure in which it acted was flexible COP in practice. Background structures were the continuous logistics evaluations and improvement of flexibility as well as contracts regulating the exchanges of which flexibility was a part.

The possibility of the chimney model to mediate flexibility for COP in practice is founded on the assumption that supply flexibility is needed and depends on short lead times, frequent production planning and coordinated supply chain action rather than stocks (see Table 7.1, COP assumptions related to the chimney model). In an era of BTO focus, COP development was facilitated by the procedure for and the rule defining the agreed-upon flexibility. The model was a mediator between the demands of flexibility and what was possible. In an era of LTO focus, COP development was impeded by flexibility that became exploited for objectives other than customer satisfaction, and the rule-based flexibility did not resist but served for such different purposes; this is in line with claims that different groups enact different structures through their recurrent interaction with a particular set of properties, in similar and different contexts, at the same time and over time (Orlikowski 2000:420), as is illustrated in the COP in use.

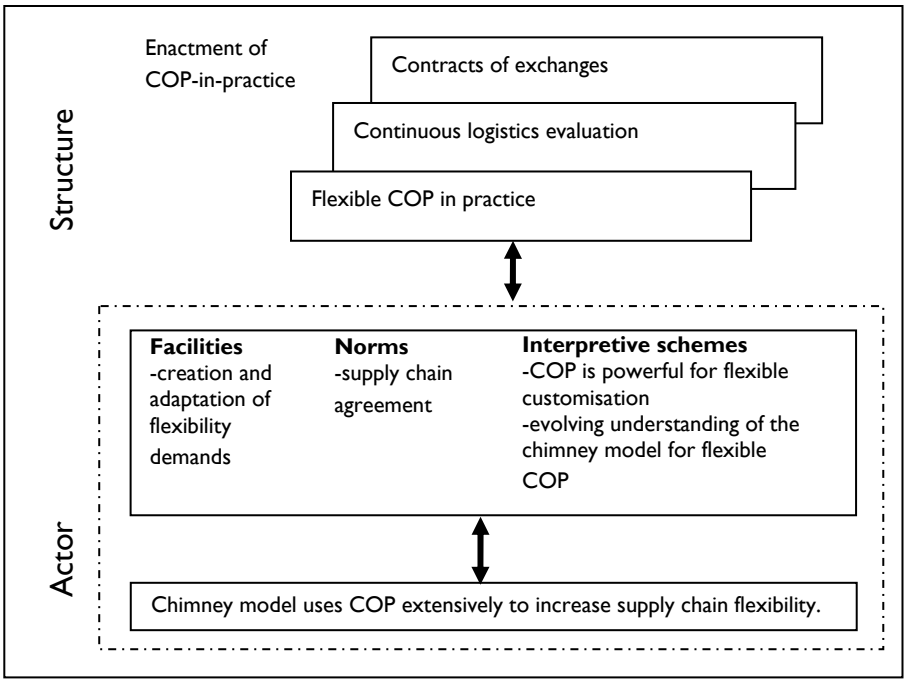


Figure 9.5 Chimney model duality of structure. Source: Adapted from Orlikowski's Figure 2 (2000:410).

In the interaction, Table 9.5, the actor (chimney model) created variability in material flow that in turn caused problems in the interface with transports. The transport structure relied on space utilisation that is dependent on stability rather than variability and speculated full loads rather than postponed, frequent smaller loads, which impeded the chimney model's aims to secure flexible deliveries. The structures of "Continuous logistics evaluation" and "Flexible COP in practice" both interacted with the chimney model to converge customer needs and production without buffers (facilitated by the "Contracts of exchanges" structure). However, the "Contracts of exchanges" structure diverged COP development from these structures by its extension to transporters that resisted such flexibility.

Thus, the interaction increased supply chain integration for better and for worse. The chimney model is a routine that is used with different outcomes, and the development of COP in practice was reinforced. The performance of COP is situated in the overlapping social systems. People's recurrent and situated action enacted the COP in practice and other structures and reconstituted the COP structure. This development might be deliberate or emergent (Orlikowski 2000); for example, the engine supply negotiations illustrated the deliberate intent to maintain flexibility. The strong

interdependencies and rule-based action in the supply chain tended to *reinforce* rather than change COP.

Table 9.5 Development of the use of COP by the chimney model in terms of conditions, actions and consequences. Source: Adapted from Orlikowski (2000)

	Chimney model
Type of enactment	Application rather than change/inertia.
COP in practice or the structure in foreground	Flexible COP in practice.
Interest in using COP	Weak. COP was the basis of the origin of the model but engine supply negotiations became its basis of development.
Interpretative conditions	The conventional understandings of required COP flexibility needs regulation in order to make sense in supply.
Technological conditions	The chimney model has to adjust because of other types of demands, also changes to the data.
Institutional conditions	The chimney model springs out of COP structures and regulates normative and authoritative demands of it.
Processual consequences	The chimney model remains as a work practice in collaboration with EDI to secure flexibility in an interwoven structure of demand and supply. Implications of the model based on the technological conditions are that flexibility is used up, with adherent costs without customer benefits. Supply chain actors are averse to the number of late changes in orders.
Technological consequences	Adjustments to the tool are made in negotiations and manufacturing enforces limited flexibility. No changes to the data.
Structural consequences	Some structural consequences are seen in the debate after the engine chimney negotiations. The chimney model per se reinforces and preserves COP status quo in an automatic way.

The interdependencies on the demand side that provided data to the chimney model were of another kind than in the production system. The strategic development is the process of enactment through a structure. An actor such as the chimney model acts in one structure of complex interdependencies in order to sustain a way of working by reinforcement. It takes action based on customer orders that are created without that type of interdependencies, but acts to change status quo. Adherence to chimney model rules means a high degree of integration in the social structure of the supply chains, which is problematic as the parties change in relation to different and individual structures of their rules and resources that are not in common. The difference between reinforced COP in supply and transformed changes of COP is of importance for COP results and further action. Orlikowski (2000) argues that processual and technological consequences are often an intended outcome of people's knowledgeable actions, while structural consequences are much more

likely to be unintended consequences of actions. Giddens (1979) emphasises that the intentionality of human behaviour is a process in which the reflexive monitoring of action can make the intended reinforcement and transformation. It is possible that involved action will be attuned in strategic development by a dialogue that creates attuned modalities (in terms of their power, sanctioning norms and mindfulness based on knowledge), which in turn would converge action in overlapping structures in the system. The capacity in such transformation needs power to be instantiated in action as a regular and routine phenomenon (Giddens 1979:91). Resources mediate such power, and structures of domination are reproduced with power use in their transformative capacity of action. Then, what happened to COP in use? Some parts of the supply chain tended to reinforce status quo, others acted to transform it.

The enacted order fulfilment process

The COP-in-use analysis illustrated that the enactment of COP structures is far from embodied in one given artefact of COP, because actors and structures interact differently in an era of LTO and volume challenges than in an era of BTO implementation.

A COP pattern

The artefact of BTO, such as enacted by the recurrent social practices of a community of supply chain users, might change substantially when time and different actors in the supply chain are taken account of. Some outcomes of the development, as discussed in Chapter 7, "Performative effects", were the customers' change in consumption and the dealers' competitive rather than customer-oriented sensemaking related to sales targets and to other dealers. Customers became objects rather than co-developers. The sales company facilitated competitive behaviour rather than promoting interaction between the customer and the dealer. The supply chain put flexibility in the background to improve efficiency. Transparency and integration were the same but paid off less; they did not turn out with the same efficiency as previously, and consequently production had to react, and here Best-in-Class made sense.

Changes in the order-to-delivery process, i.e., near-term changes, had consequences for Volvo Cars and for suppliers. Each situation was resolved, often by using overtime of suppliers and airfreight to plants in order to cope with the changes. The source of the situations, the parties involved and the resolution might differ. Both changes in orders and changed prerequisites might be problematic. Changes in orders normally take place in downturns when the order queue is short; then changes are negotiated in capacity and in delivery plans. The volume targets created a similar situation, including speculation and many changes in the near term. Changing prerequisites for different actors affected the order-to-delivery process by longer lead times, less priority to the customer, less flexibility by agreements and a cost focus that

reduced the propensity to coordinate, to carry stock and to have extra capacity. A chain of people needed to take urgent measures in order to cope with the change. The actual consequences varied. If, for example, supplier overtime was negotiated as a solution, then the purchasing function was responsible while the person responsible for inbound deliveries handled potential airfreight. Consequences were different in different places of the supply chain.

In the development, purchasing needed to reduce costs. Far-away suppliers were one legitimate way to accomplish that; buying with Ford was another legitimate way to do so. However, both ways were based on, at the least, a short-term cost benefit but had consequences for lead time and for flexibility. Actually, the cost of flexibility increased with these types of measures in contrast to the cost of flexibility when COP was implemented. Then the decreased lead time resulted in both flexibility and in reduced costs. As other structures were enacted, the coordination of the order-to-delivery process lost cross-functional attention and the actors worked with a stronger focus on specific problems in cross-functional groups, which resulted in little discussion of the whole order-to-delivery-process development. A few order fulfilment practices conditioned the order-to-delivery process, such as the chimney model, frozen horizons, sales practice, planning and order transformation. The practice of changing a planned order was altered based on experiences and acts of marketing and sales. The practice of replacing a planned order with a customer order was limited in that manufacturing denied requests, fixed the speculated order, and demanded that a new order should be placed in order to cope with the requested change. Sales practice and planning/order transformation changed, which is in line with their characteristics of being dependent on human agency interaction (interpretative legitimacy) in order to change (Jarzabkowski 2005). The chimney model and frozen horizons are embedded in structures and have a high structural legitimacy (Jarzabkowski 2005). Changes in order fulfilment practices are often an intended outcome of people's knowledgeable actions (Giddens 1984; Orlikowski 2000), but the structural consequences of, for example, COP properties are often unintended consequences (Giddens 1979; 1984).

Competing performative definitions of COP

Jarzabkowski (2005) discusses patterns of strategic action based on legitimacy (structural and interpretative), while Orlikowski (2000) discusses technology use in which the action is based on a duality of structure of an actor and rules and resources. How do these conceptualisations make sense in relation to each other? Both authors outline consequences and conditions of studied enactment and are open to concurrent consequences as people are assumed to learn and make choices of how to interact. Jarzabkowski's main source of inspiration seems to be Engeström's activity framework (Jarzabkowski 2003), while Orlikowski draws on Giddens's theory of structuration. Both involve the study of social practices.

On the one hand, in Orlikowski's study salient conditions were seen to be interpretative, technological and institutional conditions, regardless of whether these are acknowledged or unacknowledged. Relevant consequences, both intended and unintended, were processual, technological and structural. On the other hand, in Jarzabkowski's study the conditions are primarily based upon legitimacy, such as weak versus strong structural legitimacy and weak versus strong interpretative legitimacy. Relevant consequences relate to strategic development, such as weak dynamics, strengthened development, altered development or stabilised and reinforced development. This implies that the theory of structuration from which Orlikowski takes off is "more open", for which it has been criticised, because it is difficult to apply to empirical studies (see, e.g., Berard 2005).

In addition to legitimation (Jarzabkowski 2005), Giddens proposes signification and domination, which together are the basis of the actor's actions. These are unseparable except for analytical reasons in order to better see norms that sanction action, interpretative schemes for communication and facilities that are drawn upon for power (Giddens 1984). Thus, the Orlikowski/Giddens approach might be argued to facilitate a fine-grained analysis for situational outcomes (including acknowledged or unacknowledged conditions and intended or unintended consequences), while the Jarzabkowski approach seeks strategic patterns created by (top managers') strategic actions.

Jarzabkowski's description of new avenues for research, i.e., multiple strategies, from practice to performance, and strategising in case of goal ambiguity, relates well to Orlikowski's application of the theory of structuration. First, multiple strategies, by inclusion of concurrent structures; second, strategising did not include outcomes, which are consequential to strategy research, while the theory of structuration includes content as well as situational outcomes via the enactment of resources; and third, goal ambiguity is present by the competing structures and more so by links to constraints, contradictions and conflicts. Jarzabkowski stayed in organisational strategies, and then the dynamics of a strategy are, potentially, more interesting. But there is a problem with this organisational deliberate strategy research in relation to strategic development.

Jarzabkowski (2005:156) argues that procedural strategising is powerful for commitment but its structural legitimacy is also related to strategic drift, which is seen as a key problem in strategy making. She describes it as administrative practices of procedural strategising embedding the strategy so that the interest moves away from the goals of the activity to the practices for achieving the activity. Practices are modified, in which other targets than original goals shape the strategy. However, strategic drift might be more than a key problem; it might be an opportunity. Enacted strategy includes knowledge and deviates from planned strategy.

Regnér (2003) brought in the concept of inductive versus deductive strategy making, where top managers are deductive strategy makers. Inductive strategy

making is externally oriented with exploratory strategy activities which actually had a major impact on the development in Regnér's cases. Thus, development may need a certain degree of goal displacement because in some aspects the strategies make little sense, which is recognised as they are enacted. Hence, in the development of COP, the deviation might be better seen as an essential alignment to the situation. In order to learn more from the inductive strategy makers, I have shown the supply chain to be important to change in strategic content and to outcomes. Thus, this is more than a case of Volvo Cars' COP strategy, because COP involves more actors who influence the development by interdependencies in the product, production and governance that materialise in conditions, interaction and consequences related to actors and actants such as dealers, market function, supply chain and the chimney model.

Development induced by actors' use of COP

Customers substantially transformed COP as is seen in Table 9.1. Many customers were responsive to changed conditions of car sales and changed their actions based on conditions in order to increase benefits related to a car purchase. It was to some extent unacknowledged conditions that a premium brand would benefit to some degree from push sales of less costly models, in order to take advantage of customers that were interested in the brand but not in customisation. Also, unintended consequences of the strategy development were to be seen in the process, reduced customer satisfaction, and in the technology, delimited possibility to use promised potential for customisation and in the wider structure relate to consumption patterns. Thus, the customers' action influenced the strategic content to a large degree, in that they responded to competitive offers oriented to a market rather than a customer and haggled price in negotiations instead of learning about premium car brand features.

Development induced by dealers substantially transformed COP as is seen in Table 9.2. Dealers enacted the COP strategy based on the conditions it permitted in their business; they sold a premium car and collaborated to a great extent with customers in their car ownership. As their situation changed, the conditions for strategic COP development changed and ended up in push-based sales. Dealers and market function people are related in a common network that is associated with a business logic and forms specific conditions for them. In addition, they experience another way of being as the car is sold by an individual (supported by the organisation) in contrast to the production and the product development that are reliant on cooperative action.

The market function substantially transformed COP (Table 9.3). Consequences for the production system were severe in that the order-to-delivery process was changed by the actors' performance and by input to the process. The COP system was aligned to an LTO business model by volume challenges. The supply chain and the chimney model enacted COP development by sticking to agreed-upon order fulfilment practices, as is seen in Table 9.4 and in Table 9.5. Their conditions are in stark contrast to those of the

business side, and they tend to form a network encompassing the production network with another type of dynamics sustaining stability because of their understanding (Orlikowski 2000; Law 2007). COP and flexibility separate them from the other part of the automotive industry, while premium and BTO customisation separates the business network from the other parts of the automotive sales industry. The focus of governance on cost reduction and headcount made flexibility increasingly difficult and thereby COP practices were in need to change. However, the conditions for the chimney model changed; the chimney model acted in a fixed manner but reinforced continuation of COP development until another direction was formally negotiated and agreed upon.

Mindful stability

Patterns of actions might generate a wide range of outcomes, from apparent stability to considerable change (Feldman and Pentland 2003). The ostensive definition from Chapter 8 includes an idea and guidance, but the attempt to explain principles became rather weak. The performative definition includes enactment which might end up in change or stability. Feldman (2003) explains stability by actors' mindfulness. Actors make conscious efforts to understand what actions make sense in the context. Her argument is that actors use what they understand about operations to guide their performances; this includes relevant performances of others, such as the performances of order planners that guide suppliers' performance. Actors use these understandings in choosing whether to enact the requested change, and in so doing, they create and recreate the understandings about operations (Feldman 2003). This means that besides the performative explanations of effects of practices (and their reproduction) on change and stability, this is a performative explanation of the production and reproduction of understandings, which is in line with Giddens's discussion about reflexive monitoring. In the happening, the actor will do a reflexive monitoring of the action (see Figure 9.6).

The supply chain interdependencies and rules of the chimney model, frozen periods, etc., direct human conduct towards relative stability, both material stability by resource combinations and discursive stability by distinctiveness from practices (Law 2007). The actor who worked with changes related to the production system interacted with the chimney model and contacted suppliers in case of problems. The actor wanted to request additional flexibility but also worried about the supplier and hesitated to request changes because of the great difficulties experienced by some suppliers, which implies strategic durability (Law 2007). The fact that some changes were without any substantial customer benefit was unacknowledged, and consequences besides the delivery were unintended. The action was motivated, rationalised and reflected on (see Figure 9.6). Some of the conditions related to the fact that downstream actors interacted with other structures and rules and became motivated rather than

regulated. The incentives to increase volumes provided conditions unacknowledged on the supply side and led to unintended consequences in other parts of the value chain. As such consequences were recognised, a formal and informal debate was initiated which motivated action to continue to respond to volume challenges and to energise Best-in-Class practices. The actors' understanding of operations was based on others relevant to them (the market side and the volume paradigm and the supply side and the COP paradigm), which promoted stability by actors' mindfulness.

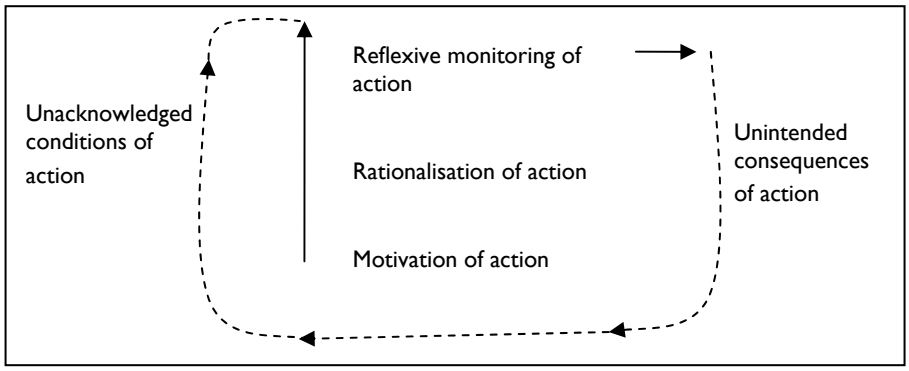


Figure 9.6 A continuous flow of conduct dependent upon actors' process of intent, reflexive monitoring, rationalisation and motivation of action. Source: Giddens (1984:5).

The dynamics of mindful stability might be an additional activity system, resisting change. The activity system dynamics that Jarzabkowski (2005:164) proposes includes five different activities, A to E, and related patterns: A, *introducing* a localised activity, either by intent as preactive strategising is enforced by interactive strategising, or unintended, as preactive strategising is enforced by procedural strategising. B, *inertial* activity relates to ongoing procedural strategising. C, shaping *change* in activity, is done by reframing, re-embedding or chronic reconstructing. Reframing is a pattern of procedural strategising that shifts to interactive and then to integrative strategising. Re-embedding is a pattern of procedural strategising that shifts to interactive and then back to procedural strategising. Chronic reconstructing is a pattern of ongoing integrative strategising. D, *stabilising* activity, is also a pattern of ongoing integrative strategising. Finally, E, *unresolved* activity, is a pattern of ongoing interactive activity. Jarzabkowski points out that most strategy literature deals with strategy as a single construct, while her university studies evidently had four streams of goal-directed activity with divergent interests and tensions. However, her assumption is that one of these is the core that should be developing.

Stability means either inertial activity or stabilising activity of the strategy rather than mindfulness of actors based on understanding of their structures.

Despite the assumed determinism in Jarzabkowski's discussion, the patterns are of interest to the development of COP. In the first era, COP was stabilised by a pattern of ongoing integrative strategising. In the volume challenges era, COP was changed and volume growth was introduced by intent in the market and sales part of the value chain. It was enforced by interactive strategising and won interpretative legitimacy by frequent use of face-to-face interaction. In this situation Jarzabkowski's patterns are unsupportive in the analysis because the only pattern that takes off from interactive strategising is the E pattern of unresolved activity. However, if interactive strategising is to achieve structural legitimacy, Jarzabkowski proposes either a shift from face-to-face interaction into the use of formal administrative practices for procedural strategising or iterative links between face-to-face interaction and administrative practices for integrative strategising. The unresolved volume growth took off by an incentives program and, simultaneously, took advantage of the formal procedures of COP. COP was re-embedded. This was the market and sales part of the value chain. The dynamics look different when seen from the point of view of other actors.

In the industrial system, consequences and conditions influence stability. COP with its coordination among actors together with tight procedures and rules in logistics for delivery precision increased material durability (Law 2007). Also, a customisation trend among firms, not only automotive ones, together with the deliberate COP strategy adds strategic durability (Law 2007). Discursive stability from the COP discourse defined reality by conditions and limitations. COP was stable in the first era and was then discursively put in relation to volume growth and the world of Ford, and the differences between these increased the discursive stability (Law 2007). However the second era reality was not that much different over time as practices were hijacked, which was problematic in terms of stability. Constraints of the development will be discussed in the following Chapter 10, and durability in action will be further analysed in relation to the industrial system in Chapter 11.

The artefact in recurrent situated practices – change and stability

The empirical chapter on performative effects, Chapter 7, ended with a substantiation of effects. These were local tier-wise outcomes and effects on COP development (Figure 7.1) and also an indication and elaboration that long-term and short-term effects had specific outcomes because of overlapping procedures. The origin was purposive action within conditions of bounded knowledgeability that gave rise to unintended consequences and sometimes perverse outcomes (Giddens 1984:193ff). In the next chapter we will go deeper

into understanding these, in terms of the social conflict of which they are an expression, and their underlying structural contradiction.

In the multiple duality of COP structures (Figures 9.1-9.5), outcomes of COP in use are related to eras, such as the BTO era and the LTO era. Outcomes of COP development relate to concurrent structures that were seen in Tables 6.1-6.6 and further analysed as situational development in Tables 9.1-9.5. The complex scenario could be illustrated elementarily as in Figure 9.7: COP development starts at a time related to its implementation. It is upheld by intentions to do so of people involved. Simultaneously other strategic development projects are ongoing that are in relation to COP.

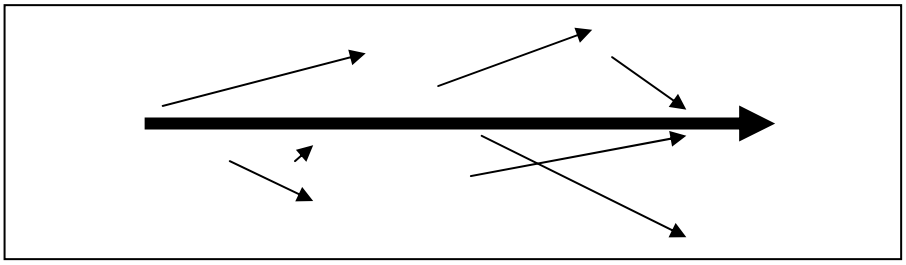


Figure 9.7 COP development comprises and coexists with other developments that diverge and converge from intended COP.

Even though COP in practice is put in the foreground in the analysis, it is meaningless to evaluate COP by itself because of its relation to these concurrent structures of development. These might converge and diverge in relation to COP over time. The evaluated outcomes in critical eras are situational. The evaluations showed, for example, how customer orientation in relation to COP increased profit but not volumes (instead the resource structure became costly), or how volume orientation boosted sales but enforced customer disorientation and discounts, or how team working increased experiential and pragmatic learning but also unsettled debates, or how cost-effective goals increased the value focus but led to suboptimisation (Tables 6.1-6.5). The critical eras have different meanings along the supply chain, and therefore they are labelled differently to direct the criticality in each tier, such as customer orientation/volume challenges or BTO/LTO.

Some effects (see Long-term and short-term effects of Chapter 7), especially long-term effects, could be seen as perverse outcomes that reduce customer orientation and supplier flexibility and increase prices in supplier negotiations by moving into uniform supply practices. Contradictory outcomes are supposed to be systematically linked to structural contradictions (Giddens 1984). The basis of contradiction, such as in strategic conduct, is when intended acts have perverse consequences in such a way that the strategic acts diminish the possibility of reaching their objectives. Giddens argues that some strategic conduct contradictions need to be understood also in terms of their

reproduction, how they are implicated in structures. The structural contradictions are when "*the conditions of system reproduction depend upon structural properties which act to negate the very principles upon which they are based*" (Giddens 1984:314).

Thus, the contradictions that appear from the analysis seem appropriate to take a step further because of the structural properties of a supply chain. The institutional form of the supply chain is a contradictory social form because the conditions that make possible the supply chain's existence call into play and depend on a governance discourse that signify interpretation with rules regarding cooperation and market positions according to the Swedish competition legislation, applied in parallel with EU competition rules and safeguarded by the Swedish Competition Authority and the Market Court. Consequences such as contradictions of strategic conduct and of structural reasons will be analysed in the next chapter.

Chapter 10 - Consequences of COP performance

This chapter steps back and becomes a theoretical part of the analysis that differs from the preceding two analytical chapters that were strictly based on an interpretation of findings. The preceding chapter drew on Orlikowski's application of the social "theory of structuration" (Giddens 1979; 1984), which has been essential in order to inform the business administration theory of conditions, enactment and consequences of development. However, if taking Giddens seriously, then consequences need to be elaborated in terms of perverse outcomes and contradictions, in order to understand and explain a development based on contradictions. Therefore, the chapter begins with an introduction to Giddens, followed by an explanation of his view on consequences and my interpretation of these in strategic development. Finally, a "so what?" question of consequences will be answered.

Introduction

The theory of structuration facilitates a supply chain strategy study. Giddens's structuration theory (1979; 1984) is meant as an ontology of social life and could be seen to describe action and social organisation that coevolve. Giddens outlines structure as a system of enacted structures in which an analysis involves conditions governing the *continuity or transmutation* of structures, the reproduction of social systems. Structure gives the social practices a systemic form of *structuring properties* bounded in the time space of social systems. Practices with great time-space extension are seen as institutions (Giddens 1984:69). With this background and an assumption that a supply chain is a social system, the theory of structuration might provide a fundamental explanation of supply chain strategy development. Volvo Cars' COP and cost orientation are seen as two institutional structures that are enacted in the supply chain. There is no basic difference in integration involved. Both are enacted by the same actors. However, the enacted cost orientation was based on the power gained from top management. What outcome might be expected? Only if the structures match in rules and resources, they enforce each other; otherwise contradictions are likely because structures enable and constrain structure (Giddens 1984:169). The structures are rules and resources that are reproduced by learning people and instantiated in action. For example, much action in Volvo Cars' supply chains is devoted to achieving delivery precision. The supply manager who reprimands a supplier for late delivery is drawing on the

concept of delivery precision, the rule that supply should be delivered at a specific time, the action plan for late deliveries employed at Volvo Cars and the perceived ability of the supply manager to supervise supply represented by the supplier. The manager and the supplier taking part in this action have the structure of these rules and resources emphasised as standards of how to behave. The power to reprimand is linked to the concept and norm of delivery precision. In another structure other norms apply and such differences can cause conflict (cf. Walsham 2002).

Structuration of a social system implies modes that are produced and reproduced in interaction. Modes are grounded in the knowledgeable activities of situated actors who interact with structures whose properties are both the medium and the outcome of the practices. The ongoing change that is implied in the reproduced practices has implications for its study. Differences are important and are sought, not by boundaries of a process, but of different eras placed in a longer durée (Giddens 1984). Langley (1999) describes such a study as bracketing of criticalities. Thus, constraints provide boundaries. Constraints on human activity limit behaviour across time space, such as a new owner promoting a new course of events, and in action: "*One person's constraint is another's enabling*" (Giddens 1984:176).

Three senses of constraint are outlined by Giddens (1984:174-176). First, *material constraint*; the body and the physical contexts of action constrain behaviour across time-space. The limited capability to participate in more than one task at a time implies turn-taking, which affects the time for a project and the possibility to undertake activities jointly with others. Second, (negative) *sanction*; power constraints are experienced as sanctions in modes of conduct taken as granted, from force or threat of force to a mild expression of disapproval. Third, *structural constraint*, structural "objective" properties that individuals perceive as fixed, such as, for example, contractual relations that limit the available options of action. However, a constraint is no predictor of any outcomes but gives opportunity to interpret some questions related to the material. The material constraint has been straightforward across the material. Dynamics and complexity in Volvo Cars' conduct has put much pressure on people via demands of cost effectiveness, customisation, etc., in addition to daily operations performed in a restructured organisation. Also, power constraints have been manifested starting with the stick and the carrot for dealers, continuing with pressure to increase sales and expressions of disapproval regarding changes in orders, which express the interdependencies in different directions. An interesting structural constraint is the different business logics that are inscribed in the subsystems. Constraints might be a motivation for intended and unintended actions, while a contradiction has inbuilt dynamics due to some kind of counter-finality or suboptimality involved by reproduced action.

Giddens (1984:373) defines contradiction in terms of "*Opposition of structural principles, such that each depends upon the other and yet negates the other; perverse*

consequences associated with such circumstances". Contradictions are of two kinds (Giddens 1984:193), existential and structural. They are about the human in relation to the material world and the constitutive features of societies. Perverse outcomes of action express structural contradictions and are likely to generate resentment and potential mobilisation for struggle in different ways, i.e., make up a conflict. For example, in the shift of the development of COP as a BTO strategy to an LTO strategy, the practices of the production system enforced BTO. Its applications in both eras were similar but differed in outcomes. A structural contradiction had occurred. BTO did not achieve the same efficiency as previously, and consequently production "had to" react and then the Best-in-Class initiative might have made sense. In the planning/order transformation practice the actors often came into debates and conflict.

Giddens's discussion of contradiction and conflict has not been widely referred to in the business administration literature that draws on Giddens. Not even in technology literature, which has used the theory of structuration to a great extent draw on that part of Giddens's work (Walsham 2002). The discussion is of special importance to theorising of coordinating integration because these are instances that take underlying contradictions into the action.

Consequences

An elaboration of consequences is meaningful for practitioners as well as for scholars, especially in the form of contradictions. In Giddens's point of view the identification of these is important for explanatory purposes:

> "Explanation can be treated as the clearing up of puzzles or queries; seen from this point of view, explanation is the making intelligible of observations or events that cannot be readily interpreted within the context of an existing theory or frame of meaning. The distinction between description and explanation then becomes in some part contextual in character: The identification or description of a phenomenon, by its incorporation within a given frame of meaning, is explanatory where that identification helps to resolve a query. Such a broad notion of explanation relates explanatory queries in science quite closely to everyday queries. In neither case is there a logically closed form assumed by explanation: that is to say, *all attempts to satisfy queries presuppose a contextual etcetera clause*, whereby an inquiry is deemed to be concluded 'for present purposes'." (Giddens 1979:258).

Consequences have been cogently described in the preceding analytical chapter, but Giddens put a special emphasis on perverse outcomes because they indicate a contradiction in the social system. The contradictory outcomes are supposed to be systematically linked to structural contradictions (Giddens 1984). After a discussion of perverse outcomes, contradictions will be outlined both of

strategic conduct, when intended acts diminish the possibility of reaching their objectives, and of how contradictions are implicated in structures (Giddens 1984). Some contradictions might originate in conduct but also be evident in structures. For example, the rationales of Ford's and Volvo's business logics were seen as difficult to integrate, not because of intent, but of differences in objectives and how sales were managed, how orders were managed, how production was planned and executed and how stocks, extra capacity and resources were used; these differences were substantial. This implies nothing more than contradictions but in specific situations conflicts might arise from this.

Perverse outcomes

Synergies and strategic conduct

Some effects from the strategic development were more coordination with sales objectives and less coordination of sales and demand, distorted customer orientation and a changed order-to-delivery process, despite the prevailing principle of customer order initiated production. Despite Ford's and Volvo's different business logics, they moved into a uniform direction by common practices in the level of business network and in the level of production system (see Figure 3.3, which will be more elaborated upon in the next chapter). Purchasing policy conditions had consequences for production flexibility. Merger integration affected other types of supply chain flexibility by staging other conditions where uniform supply practices had perverse outcomes of decreased customer orientation and decreased supplier flexibility.

The COP-in-use analysis showed that interaction in the system moved in an LTO direction, different from the intended BTO, which forms a strategic conduct contradiction. The change was an unintended consequence of intended actions and resulted in higher stocks and declining long-term customer satisfaction. As people reflected on the development, they distanced themselves from the outcome. But the strategic conduct had ontological security, partly from top management that enforced cost cutting, and partly from the wider automotive industry that was withdrawing from the difficulties in BTO. The strategic conduct driving the contradiction is meaningful, as seen in Figure 9.6 (A continuous flow of conduct dependent upon actors' process of intent, reflexive monitoring, rationalisation and motivation of action). Based on the figure, the motivation of action is from multiple strategies, where the volume growth and cost cutting had power for action. The gained ontological security rationalised action. Reflexive monitoring of action, however, questioned the development, based on the situated tier-wise learning of unintended consequences and unacknowledged conditions. Situated tier-wise action indicates a structural contradiction in BTO, because of its intertwinement with the order fulfilment process that connects parts of the supply chain otherwise differentiated in time, space and paradigm (Giddens 1979). Most differentiated

are dealers from upstream suppliers that are separated by lead time, location (these suppliers are often situated in low-cost countries) and way of thinking. The recurrent social practices of these supply chain actors are different in the order fulfilment process. For example, the dealers' way of thinking related to competitive sales where sales targets were a major part of their sensemaking. The suppliers relied on coordination, particularly to manage flexibility demands, and especially far-away suppliers made sense of efficiency. Thus, the structural properties of the supply chain are different in the chain, most evidently between supplier and dealer. This relates to the degree of supply chain integration, which will be discussed more in the next section.

Situated consequences of aligned action

Changes in the order-to-delivery process, i.e., near-term changes, had consequences for Volvo Cars' manufacturing and for suppliers. In the situation when market and sales took risks to increase sales, the forecast accuracy had decreased substantially. Outcomes in the supply chain were, for example, overtime and expensive modes of transportation, such as airfreight. Changes in orders and changed prerequisites had unacknowledged consequences and unintended consequences from the market and sales view. Changes in orders normally take place in downturns when the order queue is short; then changes are negotiated in capacity and in delivery plans. The volume targets created a similar situation, including speculation and many changes in the near term. Changing prerequisites for different actors affected the order-to-delivery process by longer lead times, less priority to the customer, less flexibility by agreements and a cost focus that reduced the propensity to coordinate, to carry stock and to have extra capacity. Consequences were different in different places of the supply chain.

In the development, purchasing, among other things, needed to reduce costs. The achieved cost benefits had unintended consequences for flexibility. There was a difference regarding the cost of flexibility in the BTO era and the LTO era. In the BTO era, costs of flexibility decreased, while in the LTO era they increased. The contradiction is in the strategic conduct. The implementation conditions stimulated BTO development because several projects facilitated it (e.g., modularisation), and people involved were influenced to act in relation to the BTO structure. Then the decreased lead time resulted in both flexibility and reduced costs. The LTO era had conditions that were influenced by other strategic projects. As other structures were enacted, the coordination of the order-to-delivery process lost cross-functional attention and the actors worked in a way that resulted in little discussion of the whole order-to-delivery process development. A few order fulfilment practices conditioned the order-to-delivery process, of which the chimney model and frozen horizons became institutionalised, while sales practice and planning and order transformation were prone to change. Purchasing was much influenced by functional integration with Ford.

Demand

The supply chain action resulted in some odd outcomes. Customers' action in response to the quick sellers was to buy. However, unintended consequences were evident, partly in the buying process of decreased customer satisfaction and regret of the missed customisation, and partly in the perception of how a car exchange should be carried out, which informs consumption patterns. Volvo Cars' volume challenges were unacknowledged conditions for the customer. The sales increase was to some extent unacknowledged conditions for the sales company. The learning was that a premium brand would benefit to some degree from push sales of less costly models, in order to take advantage of customers that were interested in the brand but not in customisation. The customers' flow of conduct originated in these unacknowledged conditions that motivated purchasing. The product and price benefits rationalised their conduct, while their reflexive monitoring of action also motivated them (see Figure 9.6 of continuous flow of conduct). Based on Figure 9.6, the motivation of action is from multiple strategies in which volume growth and cost cutting could prompt action. Rationalisation of action regards the ontological security gained. In the reflexive monitoring, customers would see that they were pushed into a deal and a purchasing situation that were less satisfying. The difference and the learning will influence their future behaviour (Giddens 1979).

Another odd outcome, in addition to customers' decreased satisfaction, was that dealers were reluctant to effects of push sales. In their conduct, dealers were motivated to push sales. The extra income streams rationalised their action, but in their reflexive monitoring of the action they acknowledged the reliance on collaborative action with customers. The unintended consequences of the action were the stocks that became an important condition of their action because they were a great risk.

Also, another aspect of the COP strategy, in combination with volume growth, became interesting in relation to dealers. It makes sense to dealers that volume growth is related to lower prices. Premium prices are difficult to maintain when the dealers are pressed to sell. Under the assumption of profitable growth, if volumes were not pushed then product innovation would decrease and premium attractiveness would diminish. Thus, there is a need to maintain prices, which leads to smaller volumes and a need to sustain innovation, which increases cost per car. Innovation costs are historically shared by joint ventures, mergers and cooperation. Some innovations are bought through cooperation with suppliers. The consequences of dealers' behaviour became bizarre to the supply chain, which experienced increased costs and problems, which put the assumption of "profitable growth" at stake: is it profitable for a part of the supply chain or for the wider network?

Integrated business/industrial subsystem

Another peculiar outcome related to flexibility from an industrial perspective and from a business perspective. The market function people changed their way of treating forecasts and caused unintended consequences for the production system. The trusted order-to-delivery process was actually transformed by dealers' "tricking" of the incentives system by speculation. The consequences created conflicts and created unacknowledged conditions of future flexibility from manufacturing. The motivation to change order practices was the volume objectives and the action was rationalised by others taking part in the action (dealers responded to incentives, manufacturing stretched their flexibility, top management posed new challenges). Issues from conflicts and reflection on obstacles were a part of their reflexive monitoring of the development. In many ways the action in marketing and sales seems released from upstream action. It was seen as business and industrial logic, and both types of action differ from transporters' actions. The actors differ and they have other types of structures. The supplier and the dealer have different structural properties in the supply chain. With regard to the conflicts, which are based on differences in time, space and way of thinking (Giddens 1979), not only the planning/ordering at the manufacturer is a critical point but also the connection between the firms where the material flow precision relies on transporters (Figure 10.1).

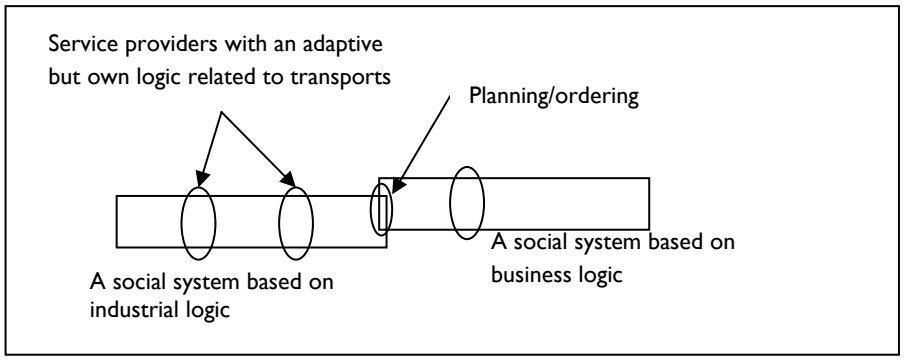


Figure 10.1 Social subsystems with different business logics.

Within the different business logic systems, the view of flexibility is reproduced by way of acting. Giddens (1979; 1984) separates between social integration and system integration. *Social integration* is reciprocity between actors in contexts of co-presence, while *system integration* is reciprocity between actors or collectives across extended time-space. Flexibility seems to be defined within such a system, and despite the understanding of socially integrated actors a system-wide understanding is difficult to achieve. These systems have specific conditions and consequences. Functions at Volvo Cars such as product development and purchasing have specific relations to orders and forecasts and

to a business logic system. A change in structure, such as in governance implying cost reduction and headcount, made flexibility increasingly difficult, and COP practices changed system-wise. Much development took the form of an application of COP, while the change of the chimney model was substantiated as a settled change (Orlikowski 2000). The relationship between different systems could be changed by reframing, re-embedding or chronic reconstructing (Jarzabkowski 2005).

A perverse outcome was the difference between actual and expressed degree of COP. The resentment was about the consequence that less than 100 per cent of production was customer ordered. It was seen as problematic or at least as a deviation from what was decided in the implementation of COP and the ongoing discourse on the content of COP. However, the resentment is also a consequence of strategy literature that describes a problem of strategic drift and goal-displacement (see, e.g., Jarzabkowski 2005). The motivation in the action is that the routine provided by administrative practices is seen to enable strategic persistence. The motivation is that active managerial control is unnecessary. Reflexive monitoring, however, reveals that the administrative practice tends to hinder development of the original objective with the consequence that the goals of administrative practices come to the fore. Strategic drift is a purposeful concept based on top management intent in the past. However, intent is to be seen as a process (Giddens 1979) in which the ongoing practices and their interaction between knowledgeable actors and situational structures change conditions, enactment and consequences (Orlikowski 2000). In that perspective, strategic drift merely shows a difference between top managers' original intent and necessities in the ongoing, it is a possibility brought forward by people in the interaction, for example, by inductive strategists (Regnér 2003), that situates strategic development. The original goal is a direction that will be aligned by contradictions along the duality of structure. As regards COP, supply chain contradictions delimited and extended the strategy differently than was originally expressed.

Furthermore, in the introduction to this chapter, perverse outcomes were described as hinting at contradictions in the social system, which will be elaborated on next.

Structural contradiction

The industrial system involves social subsystems that have a logic of their own (Figure 10.1). In the industrial context there is both low-cost production situated far away, and nearby production, while in the after-work context dealers are situated close to final customers. In the industrial logic, power is gained by operations, and in the business logic, power is gained by customer intimacy. In addition to such structural contradiction there is a contradictory discourse based on legal frameworks and authorities and SCM literature.

The institutional form of the supply chain contradicts, or at least challenges some aspects of governance of a business firm. The supply chain is often seen as a structure where buyers and suppliers cooperate. However, competitive suppliers also cooperate within the supply chain. From an SCM perspective, this should not be a problem since the intent in supply chain cooperation is improved effectiveness and efficiency for the benefit of all parties, including the final customer. In the Competition Authority discourse, a great deal of such cooperation would likely be considered anti-competitive, or at least risk having such consequences whether intended or not. Organising the supply chain in accordance with the findings of SCM theory might thus in some instances of increased integration give rise to contradictions in relation to societal regulations. This leads to a grey zone both between competitive and anti-competitive cooperation, which might be perceived differently based on perspective and time.

The interdependence of supply chain actors constitutes social interaction (Giddens 1979:76). Integration, in Giddens's terms, refers to the degree of interdependence of action or 'systemness' involved in system reproduction. Giddens defines the integration of a social system as regularised ties, interchanges or reciprocity of practices between actors, which is a condition of the supply chain institution. But to avoid perverse outcomes, Giddens describes it as important that integration is not synomonous with cohesion, and certainly not with consensus, which is in line with the industrial network approach to interactions in business relationships (Håkansson and Ford 2002; Håkansson and Snehota 2006) but counterfactual to SCM literature describing the supply chain as a whole entity. Instead integration is relations of autonomy/dependence.

There is a contradiction in the COP strategy when it comes to customer orientation. On the one hand, Volvo Cars is a customer-oriented firm, based on its product development, COP and focus on customers, as seen in theoretical terms (see, e.g., Webster 1994). On the other hand, customers are car-oriented. The customer-oriented firm is interested in the formula of customer value, which is difficult as it is experienced on the basis of dynamics including customers' demands and what is open for sales. The car-oriented customer evaluates and matches what is accessible (the structures of a customised car, the deliberate evaluation of a trade-off and car ownership over time) and what customers would like to achieve based on their facilities, norms and interpretative schemes. The purchase is more than an exchange; it has a history and a future in the customer's interaction with these structures (see Figure 9.1). Customer value, then, is an appreciation of differences (foremost of costs and performance (in line with Anderson 2004; Anderson and Narus 2004)) that come forward in the interaction based on the individual's motivation, rationalisation and reflexive monitoring. Costs and performances are compared in relation to the price, i.e., the customer needs to translate performance into a monetary value. Dealers' sensemaking relates volume growth to lower prices.

Premium prices are difficult to maintain in an era when dealers are pressed to sell. Then they need to influence choices that customers make instead of co-developing a choice with the customer. If volumes were not pushed, then it is argued that product innovation would decrease and premium attractiveness would diminish. The consequences of dealers' behaviour became bizarre to the supply chain that experienced increased costs and problems.

So what?

Perverse outcomes and contradictions are worthy of interest in order to understand the development. Contradictions are a source of dynamism, which can be stabilised or changed by action directed at resolving or overcoming them (Giddens 1984).

In Giddens's vocabulary, contradiction is a sort of structural perversity and will likely constantly throw off perverse consequences in the conduct of situated actors (Giddens 1984). Contradiction occurs through system integration (by his definition). Via domination, Giddens (1979:144) outlines three circumstances for preventing conflict of contradictions. First, *opacity of action* is that actors' insight into conditions and consequences of their action in systems reproduction is limited. This has implications for SCM literature enforcing a discourse of "risk and reward sharing", in that a full insight into risks and rewards is to some extent opaque in relations trying to prevent conflicts. Risks and rewards are outcome-related, while practice-related SCM literature is in need of concepts that are related to action and the process. Probably "supply chain orientation" is a more practical term (Fugate, Sahin and Mentzer 2006; Sandberg 2007), expressing actors' modes and strategic commitment. Risk and reward sharing is, in line with power, perceived in the process (as fair or unfair) rather than being possible to evaluate afterwards (Kumar 2000). The multitude of projects in which actors are involved and the resultant complexity of resources in use, risks involved and direct and indirect rewards make analytic evaluations, at the end of projects, difficult. In the case of COP, new customer/supplier negotiations were initiated along the way if the process developed in another manner than was planned. Specific differences were resolved in a manner that the actors perceived as fair. Opacity of actions, as a preferred circumstance in integrated supply chains, actually contradicts the assumption of consensus in supply chains for the benefit of supply chain orientation. It underlines that integration is partial and involves parts of organisations and their processes (Bagchi et al. 2005a).

Second, *dispersal of contradictions* is less likely to involve conflict (i.e., actors that oppose or struggle), while overlapping contradictions tend to create an intense conflict. Giddens (1984) exemplifies instances of uneven development or regionalisation in the processes of change, when regional spread of a change in conjunction with differential rates of changes makes up contradictions that

overlap and create conflicts. Segments of contradictory structures are seen in different parts of the interdependent supply chain, which has become a spatially segmented automotive value chain. The segments are useful as coalitions, in order to gain power for action (Borgström and Hertz 2007b). The industrial production system is situated in automotive plants, in industrial areas in Europe and in low-cost countries. The distribution is situated in the city or equivalent, in areas where customers like to spend time after work and at weekends, where experience and customer service is important. The regionalisation relates both to geography and behaviour. Volvo Cars, as well as their suppliers and other firms, creates contradictions, by using far-away suppliers with another business logic, which might be expressed as "uncertain deliveries from far away harm our firm but we need them" (cf. Kingfisher and Millard 1998). These contradictions are much debated in the literature because supposedly low-cost off-shore sourcing strategies can end up as high-cost supply chain outcomes (Christopher et al. 2006). The dispersal of contradictions draws on whether the stuck-in-the-middle position exists or not; in the former case streamlining of the supply chain is prescribed while in the latter different suggestions to coordinate contradictions are put forward (Christopher et al. 2006; Goldsby et al. 2006; Sebastiao and Golicic 2008; Stratton and Warburton 2003). The deliberate attempt to disperse contradictions is rarely expressed in SCM literature; instead practices are suggested to settle them. An interesting example in line with the duality-of-structure thinking, Stratton and Warburton's (2003) Griffin Manufacturing case, illustrates how action separates conflicting business needs and that a closer integration of the supply chain enables efficient delivery in line with market needs. Their suggestion is to define business-specific conflicts through data analysis and dialogue.

Third, regarding *direct repression*, Giddens (1979) argues that power relations are often underestimated as a prevention of conflict. More often power use is thought of as a driver. Use of force or threat to inhibit active struggle might avoid the conflict despite a contradiction. The interdependency and contradictory structure of the supply chain is prone to conflict that, however, seldom arises. In the buyer/supplier relationship, between the car plant and the engine supplier, conflicts tended to move up a level in organisational hierarchy where more powerful people of the organisations were less involved in the recurrent delivery action and could take a decision. Consequently, supply chains would be less prone to be parts of conflicts than more independent actors.

A structurational analysis provides a complementary understanding of the interorganisational working of supply chains in relation to SCM and interorganisational strategising. In particular, the approach can be used to analyse contradiction and conflict in supply chains based on understanding of actor heterogeneity, integration practices and the dynamic nature of strategy (cf. Walsham 2002). Giddens made little reference to supply chains or to strategy, but developed the abstract theory that is applicable to different kinds of social systems. Consequently, I have compared my understanding with other

interpretations of the theory of structuration and draw on a supply chain strategy in the duality of structure. In terms of contradictions, the supply chain provides multiple examples but conflicts in action are scarce. The analysis based on Giddens's contradictions has few forerunners (Kingfisher and Millard 1998; Walsham 2002). The supply chain involves several strategic and structural contradictions that explain the strategic development of supply chains.

Chapter 11 - Interorganisational strategising

This final part of the analysis is devoted to a discussion of strategy development in and of practices. In the preceding chapter I discussed unintended consequences and performance of purposeful action in an industrial network of business relationships and its production system. This chapter further elaborates the meaning of the industrial network, its integration and strategic development. The supply chain strategising draws on the conceptualisation by Johanson and Mattsson (1992) and a view of integration that focuses on social and system integration by drawing on Giddens's theory of structuration. What appears is that the supply chain institution as described in the literature, ingrained by ostensive definitions, becomes contradictory to the supply chain performance. In this chapter, I will further illustrate hot spots based on practice and contribute to a strategic development discussion of integration, lean/agile and the industrial network.

Practices

This thesis is based on social practices, which is a way to understand dynamics and complexity in the action and make sense of what is happening. In the first analytical chapter the ostensive definition of COP, seen as a BTO strategy was reexamined by the practice view. If the study had stopped after such an analysis, then it could be argued that either the concept is wrong or the practice is wrong. However, the exploration and analysis of the performative definition in the subsequent analytical chapter revealed another insight learnt from the action. BTO is a theoretical concept while COP is a Volvo strategy that links to BTO and is used as a discourse in the organisation. The performative analysis intertwines the conceptual knowledge with the empirical material. A strategy is situated as a structure that is drawn upon differently by different actors in different time periods. A supply chain is a term including different actors with different conditions that are autonomous but interdependent. In those terms a supply chain strategy is a moving target regardless of the content of the strategy. The literature review revealed that there has been a long-standing debate whether "stuck in the middle" is a thought experiment or a reasonable basis for managerial implications. That debate is going on at an abstract level.

Other theoretical contributions relate to degrees of customisation and standardisation and draw on specific ways to do so. However, little of what is seen as problematic in the action, such as dynamics and complexity, is brought

into that theoretical discussion. My interpretation is that social practices are the least common denominator in lean and agile practices. Lean and agile practices draw on similar and sometimes the same social practices, as is seen in the first analytical chapter. For example, practices related to reduced lead time are beneficial for both lean and agile strategies. Practices related to push sales are detrimental to both. Then, other practices have created different conditions for the development of each with different consequences. The actors are interdependent by conditions and consequences in the happening, their actions converge and diverge in relation to others' actions influencing the degree of change and stability they experience. Thus, a specific development relating to a common denominator is likely to lead to unintended consequences which coincide and might counteract other practices.

In the performative analysis of COP, practice is in focus in order to understand what happens in terms of change and stability in the action. Stability is not always related to action in the literature, but much action might be required in order to provide stability among, basically, autonomous actors' action. Supply chain actors are dependent on their relations and they are socially integrated by their interaction of practices and common structures. Supply chain integration, like supply chain strategy, is a system that is only loosely connected, because no one takes part in it. Rather, actors take part in social integration that might lead to a system of integrated actors. Social integration means systemness on the level of face-to-face integration, while system integration refers to connections with those who are physically absent in time or space (Giddens 1984). The mechanisms of system integration presuppose those of social integration but are also distinct.

Interorganisational strategising in and of practices was analysed as COP practice in the preceding chapter and I will continue that discussion in the final part of this chapter. Next, a performative explanation of integration, lean/agile and the interorganisational strategising structure of the industrial network will be further discussed.

Integration

Social integration and system integration

Essential findings from the Volvo Cars material might be atypical because of complex products and dynamic development in which coordination in different aspects is a prerequisite. Actually, the Volvo way concerned coordination with knowledgeable suppliers. High costs related to development, production and distribution promote coordination. However, it is not coordination in order to control the whole supply chain. Volvo Cars make demands on their suppliers, who in turn make demands on their suppliers. Occasionally, industry-wide development for integration takes place via, for example, Odette and EDI application. However, the IT integration was an act of domination; it became a requisite for becoming a supplier. It is a special case of integration in that

system integration is created, which in its workings often drives social integration in order to improve performance or at least manage the basic requisites. Otherwise, integration emerges in relations in different directions, rather than being a linear or a cyclical process. In the SCMo project the supplier resisted further integration of IT because of their deep integration in other aspects, such as production and delivery precision. This indicates that integrative efforts are problem-oriented. Problem orientation is politicking in order to create enough action towards such structure (Orlikowski 2000; 2001), and actors make conscious efforts to understand what actions make sense in the work being performed (Feldman 2003). The situational development of integration relies on social integration of the type face-to-face integration. The modularisation project started in social integration in many dimensions in order to promote, for example, product development, logistics and production routines. The different social interactions of the suppliers and Volvo Cars constitute system integration with common structures and common logics of how practices are to be done. In essence, system integration has structural legitimacy and can at best achieve procedural strategising (Jarzabkowski 2005). In addition to Jarzabkowski's study (2003) of formal strategic practices that are associated with continuity of strategic activity in one case study but are involved in the reinterpretation and change of strategic activity in two cases, this study relates interdependent firms' strategic practices to critical practices that are related to continuity and change by integration. Social integration will, in addition to such procedural strategising, transform action into integrative strategising (Jarzabkowski 2005).

In the performative analysis, Chapter 9, conditions and consequences appeared different along the supply chain. The specifics of the actors' performance, on the one hand, deny the supply chain integration that SCM literature often prescribes and support the hesitance that practitioners give voice to in critical SCM literature. On the other hand, social integration based on action with a common history and future, in terms of a problem, acknowledges a power basis of autonomy/dependency that Giddens (1979; 1984) uses in the conceptualisation of social integration. Specifically, he argues "*social integration is reciprocity of practices between actors in circumstances of co-presence, understood as continuities in and disjunctions of encounters"* (Giddens 1984:377). More specifically, power gives opportunities to the action. System integration without face-to-face interaction would mean that the relation between autonomy and dependency is altered.

In the eras, structures of the order flow, material flow and financial flow of relationships become continuous because of the structure of the order-to-delivery process of *tier-wise* arrangements. The customer places an order, the dealer places an order, the manufacturer orders production and places orders to suppliers. The information flow involves these orders and their confirmations. Are the flows integrated? The actors cooperate and coordinate activities and resources. Internal and external boundaries lose in importance because

processes are integrated across such boundaries. The negotiations of how to go about will involve different actors in a process of change that will affect outcome (Hertz 1992). Change is inherent in all moments of social reproduction (Giddens 1979:114). The social systems are chronically produced and reproduced by actors involved. System integration gives transparency and relates as an outcome and a resource to draw on in the reproduction of action. There exists a certain degree of tier-wise integration and transparency between these actors, which is situated depending on practices in the interaction.

SCM literature describes integration as an investment (Easton 1992) which demands complex decisions (Dam Jespersen and Skjøtt-Larsen 2005) because of its multifaceted nature (Bagchi et al. 2005a). This is illustrated in the COP case including different actors' coordination in different directions simultaneously. However, the supply chain integration that involves suppliers' supplier to customers' customer is questioned because it is difficult to substantiate empirically (Fabbe-Costes and Jahre 2007; Fawcett and Magnan 2002). The difficulty might relate to the fact that surveys of integration are likely to capture system integration, while social integration is of a dynamic character. In addition, investigations that ask for supply chain integration seen as a whole with many actors working in consensus might leave sporadic and situational integration unnoticed. However, social integration relates to system integration. System integration might achieve efficiency but hardly effectiveness, because of dynamic and complex demands of actors involved. Social integration creates effectiveness based on mindful practices. The dialogue is crucial in order to ensure conditions and consequences of integrative processes.

The social view of integration is defined as regularised ties and reciprocities of practices between actors but quite different from cohesion of a system or consensus within a system (Giddens 1979:76). Cohesion is a structural concept and consensus is an actor concept. Transparency relates to both in that it increases actors' knowledgeability of action and alters the relation between autonomy and dependence, which is the basis for the social view of integration. Transparency related to supply chain integration (suppliers' supplier to customers' customer) is merely an outcome of transparency in action. Thus, social integration is concerned with systemness on the level of face-to-face interaction and means reciprocity between actors in relations of autonomy and dependence (Giddens 1979). Via reproduction of institutions, social integration can propose system integration. System integration is reciprocity between groups or collectivities in relations of autonomy and dependence (Giddens 1979).

Integration in an industrial system

Figure 11.1 illustrates the industrial system as a supply chain that has social interaction in the flow of time. I will use the figure here to discuss social and system integration and will later in the chapter return and discuss the industrial

network. There are multiple recurrent social practices that are socially integrated and, furthermore, interdependencies between groups signify system integration. Social integration to system integration can appear in a myriad of combinations depending on situational social integration in exchange relationships, in control and in resource relationships with interdependencies.

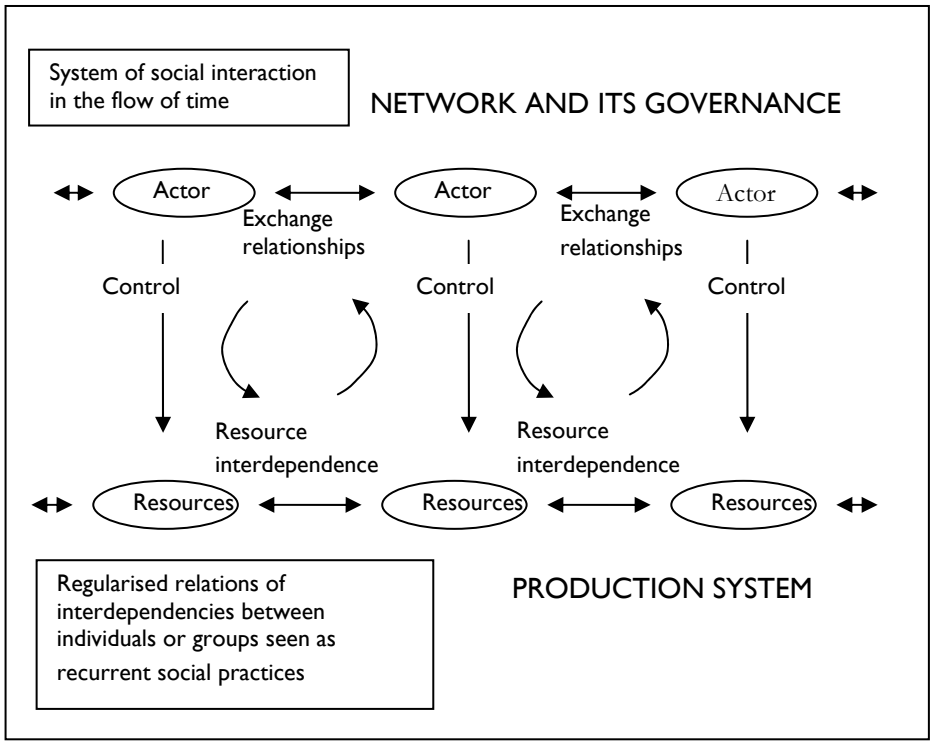


Figure 11.1 Integration in a supply chain. Source: Adapted from Johanson and Mattsson's model of industrial systems.

Giddens (1979) argued that integration was not cohesion, but what kind of stability is evident? Giddens's structuration theory has received criticism, because it fails to discuss durability or a fixed point in a development as consequences of practice (Kaspersen 2000). However, Giddens (1979) argues that social practices do involve change and stability; despite that, structuration is always a process. The consequences might be change or stability. My use of the structuration theory is based on eras and interrelatedness. Thus, the practice approach of this study is like the effect of a weaving-together of interconnections in action (Gherardi 2009) and illustrates the happening based on the eras. From inside, knowing as a situated activity with its temporality and processuality (Gherardi 2009) would complement this study. Two examples of empirical studies might be used for that purpose.

First, Elter's (2004) study of Telenor and its four core business units' strategising is based on situated strategic activity. Elter explains how interdependent practices are used to treat strategic issues in the action. The interdependencies are coordinated via integration mechanisms, which are used in different combinations for strategising as incremental adjustments. In the case new practices are created, it is a strategic renewal process as it involves strategic change (Elter 2004). The integration mechanisms connect objectives and consequent activities by different combinations (Elter draws on Mintzberg 1979; 3-7 but see also Fugate et al. 2006; Håkansson and Person 2004 for integration mechanisms). The extent to which practices exist or have to emerge for upcoming strategic issues has significant consequences for the speed of conduct.

Second, Abrahamsson and Helin (2004) focus on lateral cooperation between functions in the implementation of Atlas Copco Drills' COP. The organisational functions had their own prioritisation and instrumental rules based on technology and economy. In the order-to-delivery process, patterns of actions guide cooperation between functions with multiple objectives. In the action, Abrahamsson and Helin (2004) explain that the actors, despite the functions' instrumental rules of behaviour and consequences, (1) negotiated contradictory instrumental rules at the beginning of the order process, but later on they acted in a manner of consensus, (2) might express instrumental rules in talk or show these in actions in order process interactions.

Durability

It is meaningful to reflect on *durability in action*, from the idea of COP and throughout its perpetuation (Law 2007; Schatzki 2005), in order to understand durability of COP in the integrated supply chain (Figure 11.1) from (1) the network configuration itself, (2) the enforcement in strategy employed and (3) the strangeness in action in relation to other enacted realities (Law 2007):

- The production system has strong material durability by the network configuration of activities itself. It is enforced by coordinating face-to-face interaction. Also, the parallel level of network governance enforces durability, where exchange relationships using contracts normally add stability. The pattern of action in Atlas Copco Drills' production system was learnt. Different and contradictory conditions and consequences were treated according to known patterns of action (Abrahamsson and Helin 2004).
- The resource interdependencies of the production system relate to material durability in Volvo Cars' supply network. Material durability is strong on the basis of the common planning and information-sharing (see, e.g., Figure 3.4, p. 38 of the automotive order fulfilment process). Existing practices used to treat strategic issues are coordinated, which facilitates strategising by incremental adjustments, for example, how

extra demands of flexibility were handled by Volvo Cars' planners (Elter 2004).

- The production system enforces strategic durability, which was seen in the arguments from marketing, sales and dealers. Despite their actions that in some way counteracted BTO, they also questioned the scope of exceptions from COP and unintended consequences of their actions. This exemplifies the mechanisms of integration (Elter 2004). The questioning was a way to propose that adjustments in COP were harmful because there is a difference between BTO and LTO that puts demands on other practices.
- The difference of this industrial system from other brands' industrial systems' order fulfilment practice is significant, and Volvo Cars are proud to produce cars based on customers' orders. COP is enforced by discursive stability, in addition, by the strangeness of COP in relation to other automotive order-to-delivery strategies.
- The entwinement with the Ford industrial system affected the Volvo industrial system in supply relationships, in purchasing patterns and in product development besides the sales logic. On the one hand, the great differences between the industrial systems could be a reason for the stability of each but, on the other hand, the common strategic intent diffused parts of the industrial system with great potential to spread to other parts. The governance level thereby has lower durability in intent of the governing network configuration itself, the enforcement of strategy employed and the specificity of action.

Dynamics of integration

Integration in the supply chain is a basic assumption in SCM literature. However, its recent contributions have questioned the reality of supply chain integration and its outcomes (Fabbe-Costes and Jahre 2007; Fawcett and Magnan 2002; New 2004). Some within the field have questioned how integration works (Bagchi et al. 2005b; Bagchi and Skjøtt-Larsen 2003), but more exploration is needed (Fabbe-Costes and Jahre 2007) because the integrated supply chain has found no substantial support from empirical SCM research (Storey et al. 2006). The logic of integration is conceptualised by coordination mechanisms to be situated and specific (Fugate et al. 2006; Håkansson and Persson 2004). It is not necessarily incremental in its development (internal, external or chain-wise integration). Best-practice research indicates a superiority of process-oriented integration for the physical flow of goods together with structural integration in customer-oriented teams (Sandberg 2007). Sandberg's thesis is that integration is a combination of process, structure and content issues (in line with Hertz 1992). The structure in which integration develops comprises interactions, relationships and networks of industrial parties and other stakeholders in which the interactions fuel dynamics (Johanson and Mattsson 1992). This literature explains conditions,

some consequences and the structure of integration, but little action. Therefore, I propose that integration might be seen in at least three different dimensions (in line with Sandberg 2007) that interact in the strategic development of the supply chain for change as well as durability. Figure 11.2 is an illustration of integration that corresponds to the performative definition of COP and that indicates that elements of the ostensive definition is determined based on integration.

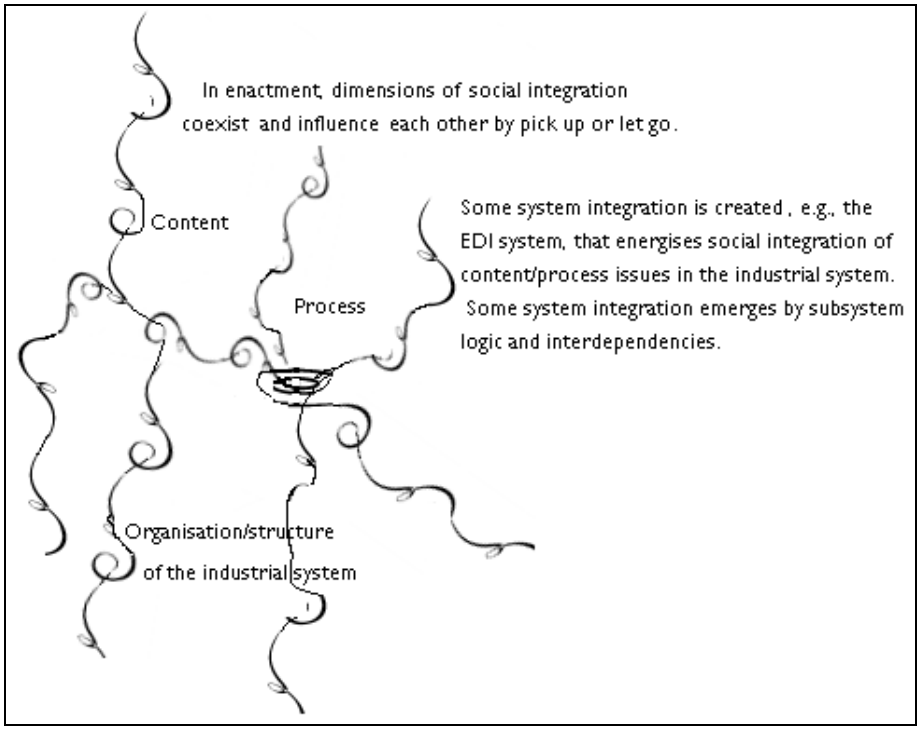


Figure 11.2 Dimensions of social integration interacting in strategic development that results in system integration.

First, process of integration relates to the industrial system's (Figure 11.1) interactive and procedural strategising (Jarzabkowski 2003; 2005), in which strategic activities are created in inductive and deductive strategy making (Regnér 2003). In the inductive strategy making, the actors' identification of the issue and their pattern of action guide development (Abrahamsson and Helin 2004; Elter 2004), such as emergent solutions based on history, future and encountered consequences. That kind of coordination leads to social integration involving exchange relationships at the governance level, resource interdependence at the production system level and control between the levels (Figure 11.1). Deductive social interation is for example, trial and error of a

concept such as supply chain monitoring. A change in the process of integration will influence the content of integration.

Second, content of integration relates to the governance level and the production system level of the industrial system where interactive strategising tends to be influential in order to create multiple objectives and to overlap and connect the strategic development of these. Elter (2004) proposes that top-level managers engaging in new, less understood issues tend to formulate strategic issues in abstract terms, which was the case when the market function of Volvo Cars was engaged in the volume growth objective.

Finally, organisation/structure of integration relates to the industrial system, such as the common EDI system, different social subsystem's logic and interdependencies among resources. Inductive strategising of social integration brings up content issues that are solved by system integration of common structures and practices with a high degree of structural legitimacy (Jarzabkowski 2005). Any change is likely to be a slow process because the issues are abstract and call for a new combination of integration mechanisms (Elter 2004). When the deductive strategy making of organising has facilitated system integration, procedural strategising is likely (Jarzabkowski 2005).

The role of integration for strategic advantages is elaborated on, and in the nitty-gritty of social practices reproduction, these dimensions of integration will change in some aspects and be durable in other aspects. Figure 3.8 illustrates that different dimensions of the ostensive components are drawn upon in the development and taken into or withdrawn from action. When actors by intent make sense of specific strategies, one of the dimensions will deliberately change, and the others are affected. Next, practices are the least common denominator of the content of different strategies, such as lean and agile, and business-specific conflicts are logical based on situational contradiction (see, e.g., Stratton and Warburton 2003). This is discussed as a response to the debate in the literature, because in the empirical material this is not a troublesome issue as the two strategies coexist.

Lean/agile

BTO is a theoretical concept that inspires an increased degree of customisation (Lampel and Mintzberg 1996) but requires a great deal of coordination towards customer decisions, where the customisation value of the agile strategy is a trade-off to waiting time of delivery. Conditions of increased coordination and control of operations indicate that customisation is a process of learning in which a great deal might be accomplished without considerable costs (Kotha 1995) and with practices that make sense to lean and agile action (Duray 1997). Volvo Cars' implementation was dependent on lean practices, which substantiates positive combinations of the two. The problem is when lean and BTO strategies are affected differently by multi-faceted interactions and complex rationales (Holweg and Pil 2001; 2008). COP is an empirical concept

that is formed by plans and situated solutions in the course of its development. As long as the COP structure matches in rules and resources another structure, such as lean, they enforce each other; otherwise contradictions are likely (Giddens 1984: 169). In the case of COP, lean and agile practices co-exist and initially enforced each other.

It might be a challenging proposition that the two distinct approaches together make up a BTO strategy. This relates to the fact that strategising and people are inseparable. In the action, conditions and consequences motivate actors based on their frame of reference (Giddens 1979; 1984), which interacts with a structure in the foreground (Orlikowski 2000) that produces and reproduces practices in action. In the development of COP, such practices were seen to converge with and diverge from the BTO ideal. The reflexive monitoring of actors acknowledges differences regarding the theoretical construct and adapts objectives. In that way, concrete components of COP, such as commonality, change in content. The constituent conceptual components of COP, such as customer orientation, are affected by these reinterpretations. Thus, a performative development is guided by and guides different ostensive properties of COP differently over time. The development might be reinforced rather than changed, or transformed into changed structures that are enacted. Aspects are enacted by situated innovations in response to unexpected opportunities or challenges (Orlikowski 2000), which might reinforce, ignore, enhance, undermine, change, work around or replace their existing situated and emergent practice (Orlikowski 2000:423ff).

Structuration is conditions governing the continuity or transmutation of structures in a continuous reproduction. The structure's time-space binding of properties gives the social practices a systemic form, and the most embedded structural properties might be seen as structural principles. An institution is made of practices with great time-space extension. From the empirical material, COP and cost-effectiveness are two distinct institutions that have overlapping structures and practices that reproduce the embedded properties into some aspects of continuity and some aspects of transmutation. This is natural in that they are two institutions with overlaps by integration. A development, involving practice as the least common denominator in strategies, might overlap when actions are parts of other scenarios and connect in chains. For example, actions for different objectives are performed in the same place in the supply chain material arrangement, and actions from one practice form beliefs of participants in other practices. In this way, a COP strategy in a supply chain is a messy myriad of practice-material bundles (Law 2004).

When it comes to a practice-material bundle of people, resources, machines, etc., Law (2004:1) argues "*If this is an awful mess. . . then would something less messy make a mess of describing it*?". Johanson and Mattsson's (1992) conceptualisation of the industrial network with a level of governance and a production system level that are strongly interdependent because of a common practice-material bundle will next be used in order to explain action in the network. Johanson

and Mattsson do not specifically discuss this view but engage in the role of the network's position for strategic action.

Industrial network

The basis of the Johanson and Mattsson model is that development is similar to a testing process and can be done more or less thoughtfully. Development relies on interactions that are time- and context-specific (Johanson and Mattsson 1992).

Developments in the network of relationships between actors and in the production system of resources and activities are interdependent (Figure 11.1). Also, actors are dependent on each other in exchange relationships, and they control resources that are interdependent in the production system's process of activities. The casual network level and the production system relation imply that dependencies gradually become stronger (Johanson and Mattsson 1992). Such integration is a process of coordinating with a spiral effect that increases integration (Hertz 2001), which implies a strong interdependence on the past and the view of the future.

So, what is happening in the industrial network where COP is developing? In the preceding analysis, conditions, consequences and action have been acknowledged. The model illustrates direct and indirect relations and is an intelligible way to understand effects of happening in one relation. After the merger, actors actively searched for synergies by integration among two parallel industrial networks and the spiral effect of that affected development.

The different actors at both levels in the industrial network interact in the superimposed structures. The governance of the network relies on the functioning of the production system. When these actors decide on far-away suppliers or an engine supply network that breaks ties in the production system as, for example, when the engine supplier that had developed flexibility (a necessary resource in the working of COP) had to change, the interdependence between these structures "kicks back". The already discussed integration in terms of process, content and organisation is seen in its complexity and dynamics with reference to Figure 11.1, which was adapted from Johanson and Mattsson's model of industrial systems in order to illustrate integration in different dimensions of the supply chain.

In the analysis of consequences of, for example, customer orientation, Chapter 10, the development over time is outlined. How can customer orientation decrease in such a way as happened? The objective of customer orientation that had been strongly enforced over the years, in line with authoritative knowledge claims, and maintained by all actors, nevertheless changed. The actions taken are by themselves legitimate. However, action durability would be enforced by the longevity of strategy employed and by being a part of a greater movement, but its physical form is weak and it is of an unspecific character and thus easy to reinterpret (Law 2007). The development

of customer orientation is an outcome of actions with different logic bases. The business logic interacts both with customers and with the industrial logic (see Figure 10.1, p. 197). Sometimes the interaction with customers is more intense and sometimes the interaction with the industrial logic dominates. The relation between these is unpredictable; customer interaction, for example, might be spurred by media's call for environmental care. Gilmore and Pine II (1997) suggest that different approaches are needed in customer interaction, such as a dialogue with customers, silent customer observation, showing off or embedding uniqueness. The sensitivity to what actions are appropriate might be overruled by development of, for example, claims from the industrial system for an action.

Strategic development

What meaning is to be understood from principles and practices of the customer order based strategy? Inductive strategising, such as enactment in the supply chain, and deductive strategising, such as top management enforcing volume growth, emerge as strategic development affecting the supply chain and vice versa. Integration changes in different dimensions. The dynamics in the process and complexity related to content of integration and supply chain organisation relates to strategising in terms of type of activities (Jarzabkowski 2003; 2005; Regnér 2003) in which the strategic development of COP might be conceptualised. The industrial system indicates that deductive strategic activities are perpetuated on the business network level and inductive strategic activities on the production level. The industrial system is a natural basis for social integration relating to process and organisational issues. Coordinating content is an additional dimension that matters because strategic issues are likely to appear and the degree to which these are coordinated with existing objectives matters to the use of rules and resources. Actors enact rules and resources in relation to different structures, and outcomes depend on such a setup. Coordination is then a key construct in order to understand strategic development.

The principles prescribe a performance of purposeful action in an industrial network and practice involves intended and unintended consequences. What implications for integration can be drawn? A new structure that is imposed on the industrial network can trigger reaction based on an industrial logic or on a business logic (Figure 10.1). In the case practices are incrementally adjusted, they might be hijacked to match with the imposed structure, and in the case practices are developed, they tend to reinforce the strategic intent. Adjusted practices/action gave situated consequences in different parts of the industrial system. Some order-to-delivery practices were institutionalised, such as the chimney model, while others were changing, such as sales practice, which creates dynamics based on an inherent structural contradiction (Figure 10.1).

In the analysis of the COP artefact it is seen as fluid in time and space and has practices that are in use for several objectives. COP in use is situated action, it involves change and stability based on knowledge and durability of the setup (of the structuration) and it involves structures that converge and diverge along COP development (Figure 9.7). Four areas will be further discussed, in order to understand the conceptualisation of how strategic development and the supply chain are interrelated involving actors, time, durability and change and multiplicity of strategies.

First, the situatedness of actors is in its paradigm or logic of acting. This means that different actors are influenced to various degrees by industrial logic, business logic and service provider logic (Figure 10.1). Depending on the constitution of the supply chain and the actors' positions and relations to other actors, its enactment is influenced. Some structures that are enacted are basically the same along the supply chain while others are interpreted in specific ways depending on the logic applied and parallel structures that are enacted simultaneously. Actors might share conditions and consequences. Three segments that are characterised by their differences in logic (see Figure 10.1) are outlined. Industrial logic involves strong structural legitimacy from the production network, and outcomes are facilitated by stability. Business logic involves strong interpretive legitimacy and its outcomes are facilitated by adaptation to customers and a stream of differentiating products. The logic of service providers is based on the using of transport network but differs from that of the production network because it lacks the structural legitimacy that is based on ownership. Actions of service providers related to transports are based on a service logic. The structural contradictions that emerge among these segments of actors (Figure 10.1) reduce system integration.

Second, time is situated in the different logics. Time for information about orders and time for production is basically the same for the service part of the network, such as dealers. Time for information about orders and time for production in the production system is fixed in terms of scheduling, sequences and production runs with appropriate production capacity but above all with regard to incoming material as the network is highly specialised in its tasks and coordinated for deliveries to car plants.

Third, durability and change will enable and constrain different actors in the supply chain. The analysis shows that processes of enactment give outcomes in terms of durability as well as change; actors learn from the situation with its experienced conditions and consequences in the action. Intent is a process that evolves (Giddens 1979; 1984). Therefore, individual actors are enabled and constrained and have possibilities to create social integration.

And finally, a multiplicity of strategies exist and are enacted. Strategic development is an open process in which different initiatives co-develop, by intent and unacknowledged. A match of rules and resources of one structure with those of another structure will enforce the development of each and, conversely, a mismatch is likely to create contradictions (Giddens 1984).

Coordination of COP issues draws on patterns of action (Abrahamsson and Helin 2004) for which different integration mechanisms are available (Elter 2004; Fugate et al. 2006; Håkansson and Persson 2004). In an industrial system, a high degree of integration is likely in processes as well in structure over time because of participation. Shifting priorities in content influence the effectiveness of other coordination. Thus, the principles and practices outlined in Figure 3.8 should be seen in the situatedness of COP. A social practice has consequences for logistics and for strategy because these are integrated in action.

Chapter 12 - Conclusion

The preceding chapter finalised the analysis of customer ordered production as principle and as practice by a reinterpretation of strategic development in supply chains and supply chain strategising on the basis of integration and the industrial system. This chapter will respond to the purpose, how strategy development affects the supply chain and vice versa, based on the exploration and analysis in the former chapters. I will further discuss how dynamics and complexity work in relation to the ongoing process of integration in interorganisational strategising. The contributions to IMP, to strategising and to SCM will also be discussed.

Strategy development in supply chains

BTO is an example of a customer-oriented strategy and serves as an artefact that is predefined from literature. The composition is, however, vague and ambiguous in its present set of components (Cerruti 2010) that I have analysed as principles of a conceptual character and of a concrete character. However, the dynamics and complexity encountered in the practice of COP put the principles to work. It is in the use that another view of conditions and consequences can bring understanding to supply chain strategising. COP is defined in the theoretical framework as:

> COP is an interplay between variability and stability. The interplay develops in the use of COP by error or by intent and reinforces or transforms the use. COP is likely to be changed because dynamics in the moment gives new meaning (from, e.g., the technical, social or political context) at the same time as physical properties of COP define the use. COP is one structure among others that actors involved need to enact. This means that actors enact development in, for example, the structure of outsourcing, and then its logics and dynamics will interfere with those of COP. There is a recursive relationship between understandings and performances.

Principles and practice is next interpreted, before consequences that are of importance to this system's reproduction. Finally, theoretically implications are discussed.

Principles

COP is an empirical strategic concept that corresponds to customised standardisation as well as to Lampel and Mintzberg's (1996) value chain configuration and to BTO (Rudberg and Wikner 2004). This is the case when assembly and distribution are customised and design and fabrication are standardised. The CODP divides postponed activities and forecasted activities. Customer orientation is the main reason to increase the degree of customisation (Webster 1994), and collaborative customisation involves interaction between the customer and the dealer in order to facilitate the decision process of the customer. Mass customisation is grounded in flexibility and responsiveness to take individual orders and deliver the finished, customised goods quickly by postponing activities (Feitzinger and Lee 1997). Modularisation is a requisite in order to postpone some activities that could be done in response to an order (Duray 1997). Mass customisation does not necessarily relate to the production system; also types of customisation are possible that more or less involve customer interaction. It is possible to draw on whatever means of customisation to create customer-unique value (Gilmore and Pine II 1997).

In the case of COP, the collaborative customisation increased customer satisfaction in interaction with the value chain, where both assembly and distribution were customised. This was extended by means such as the quick seller, which was grounded in adaptive customisation, i.e., a standard but customisable car was sold; pre-packaged offerings were used for cosmetic customisation, i.e., to present a standard car differently to different customers, and the sales company carried out transparent customisation as they speculated and ordered on the basis of predictions of customers' needs. Consequently, COP relied on a base structure, an organisation of activities across the supply chain. As to the literature, both value chain configuration and other means for mass customisation are advantageous and necessary for customer-focused companies. However, the case illustrates limitations in the approach as the customer orientation becomes distorted.

Integration, especially IT integration, is seen as necessary for BTO strategies in supply chains. The transparency that IT integration brings in is seen as key in order to manage delivery precision and costs of buffers. That is partly supported by the case. On the one hand EDI is in use and there is a tight control of the orders and deliveries. On the other hand there is little support for any step-wise approach to internal and then external increase of IT integration. Instead any increase seems to be problem-based.

Responsive supply chains are key, but responsiveness is multi-faceted (Reichhart and Holweg 2007). In the case, actors made investments in mix flexibility while volume flexibility increased in importance, and one type of flexibility had to be traded off against another. Thus, potential and demonstrated responsiveness varies and thereby also effectiveness. In addition,

the different supply chain actors' capability of flexibility differed depending on their overlapping networks (Hertz 2006).

In the operational logistics, the CODP has been elaborated on in order to reduce lead times and better coordinate inventories. These practices are important but make little difference to customisation as long as orders come from the distribution instead of from customers, and thus the practice of the principles makes a difference.

Practice

The COP principle of customised standardisation (Duray 2002; Lampel and Mintzberg 1996) combined with customisation of the representation of the product (Gilmore and Pine II 1997) for physical and non-physical customisation combinations is advantageous but might have contradictory consequences in the supply chain. As the sales company and dealers employed diverse means for customisation, costly consequences appeared in the supply chain. Little interaction takes place between involved social subsystems (Figure 10.1) of supplying actors and distributing actors, and therefore these actors develop COP in different directions. In the situation when distribution reduced the reliance on customer orders, the production system knew little about changed conditions. Learning was delimited to handle the variances of the order flow and short-term changes. The implications to COP as an idea was not as acute even though these were debated. Also, modularity is argued to be a requisite for BTO but modularity might take different roles and these affect BTO differently. This is in line with Duray (1997), who argues that modularity might be achieved in the design position of value chain by component sharing and in the fabrication and distribution by modules. Actually, the COP in use illustrates that component sharing both facilitates and hinders COP depending on what the consequences are. Is the component sharing, for example, from the same supplier or from different suppliers in order to decrease costs of supply? The former way increases flexibility and the latter way decreases flexibility.

In practice, integration is dynamic rather than an organisational structure. There is system integration but this is an outcome of the social integration in which the process of interaction, the content of practices and the organisational entities are affected. The same applies to concrete components of the artefact such as modules and mutability by component commonality. In the case, objectives of lean and of agility were logically blended. However, also lean is interpreted differently over time and as a consequence of cost focus under the label of lean, conditions for flexibility deteriorated together with lean (in line with Christopher et al. 2006), and the supply chain strategy emerged (Sebastiao and Golicic 2008). Frequent changes and far-away suppliers enforce inventories of supply. The concrete components of the artefact relate to agreed-upon practices that have durability because the actors have agreed upon specific

routines. However, the meaning of these has been compromised by interactions.

Dynamics and complexity of integration in interorganisational strategising

Strategic development in and of the supply chain relates to differences in conditions and consequences among the actors, who might be seen as situated. The order fulfilment process is stable but enacted because of dynamics and complexity that relate to each *actor* (Jarzabkowski 2005; Orlikowski 2000; Regnér 2003). Especially three social systems are influential actors (Figure 10.1) regarding the strategic development, in which the logic of operations divides them and also creates dynamics in development. Also *time* is situated as conditions and consequences relate to a specific assemblage of these contributing to actors' understanding of operations (Feldman 2003; Feldman and Pentland 2003; Giddens 1979). *Multiplicity* of strategies also enforces the strategic supply chain development partly by enforcing strategic durability (Feldman 2003; Law 2007) and partly by adding structures that need to be enacted (Giddens 1979; Orlikowski 2000). The multiplicity of strategies is in line with Regnér's (2003) thesis that others than top managers are influential in strategising. Inductive and deductive strategy making in the industrial system rely on procedural and interactive strategising (Jarzabkowski 2003; 2005; 2008).

The patterns that Jarzabkowski highlights have a greater complexity because of simultaneous but divergent patterns in different parts of the supply chain. Social integration (quite different from system integration in Giddens's terminology) relies on patterns of action for coordination (Elter 2004; Håkansson and Persson 2004). A supply chain is characterised by integration in processes as well as structure, and shifting priorities in content influence the effectiveness of other types of coordination. Multiple strategies mean additional structures to enact with a set of resources and rules, and the way these are coordinated towards existing structures has consequences for effectiveness and efficiency. Potential strategic and structural contradictions are sources of dynamics.

Durability and change are dynamics that influence the strategic supply chain development. Different actors' enactment enables and constrains coordination. Actors learn, and their process of intent evolves, which influences, i.e., enables and constrains, social integration. The interacted structure is durable because it is a part of a supply chain, i.e., of coordinated activities by procedures and a non-bodily physical structure (Law 2007). The strategic durability is strong, especially in the industrial subsystem (Figure 10.1), because of the peculiarity of COP in the automotive industry (Law 2007). The distributing side, marketing and sales basically, treats COP as one way of customisation among others and that reduces the discursive durability. The business subsystem has different

means in order to customise (Gilmore and Pine II 1997). However, as volume growth and cost focus become important structures, also the strategic durability of the production system becomes weaker. However, conditions of volume growth and cost focus influence the enactment of flexibility and its peculiarity declines, which diminished the discursive durability of COP (Law 2007). However, the strategic conduct is continuously reproduced and changed and the discussed durability is not the sum of different kinds of durability. As long as actors involved experience, learn and develop their action, the relation between change and stability emerges.

Consequences

Basically, structures are both interacting with and outcomes of practices. Structures can develop by maintaining durability and by changing, because rules and resources enforce or contradict each other in different ways (Giddens 1984). More important than the situational change and stability are consequences due to their ability to exaggerate contradictions and, potentially, conflicts. Thus, between different eras there are *differences* in the reproduction creating constraints (and enablers) by materiality, by sanctions and by structure. If they are understood, then they have consequences that might be seen as queries and potential situational generalities. As I draw on Orlikowski's (2000) application of structuration theory, I followed her focus on consequences in my investigation, that is, processual, technological and structural consequences. This makes sense since I have the social concept of COP in focus rather than the social actors. However, the consequences were sought actor-wise in the supply chain, based on each actor's use of COP.

The customers changed their enactment of COP by a substantial transformation. Fleet customers bought a promoted car with acceptable delivery time but wanted a customised car. This is an intended outcome of people's knowledgeable actions (Giddens 1984) but resulted in reduced customer satisfaction. The possibility to customise became of limited use. Therefore, COP as a tool was changed and the in data were changed. In between the eras customer satisfaction decreased and social norms related to car purchasing changed.

Also the dealers changed their enactment of COP by a substantial transformation. The execution of push-based sales and the outcome of both increased sales and risks illustrate dealers' changed work practices. The use of COP, as a tool, was adapted and the tool's input from dealers was changed. The COP system was transformed and conformed to traditional sales logic. Also, the COP social norms of sales were changed.

The market function changed its enactment of COP by a substantial transformation. The execution and outcome of offer-to-order process changed, which to some extent was unintended while the changed work practices were an intended outcome of market function people's actions for growth. COP as a

tool was adapted in use and the input of data was changed from forecasts to volume targets. The COP system was transformed and conformed to match sales based on volume challenges. The status quo of COP was transformed.

Manufacturing and supply enacted COP by reproducing existing order fulfilment practices in the changed era. The order-to-delivery outcomes changed. The work practices enforced flexibility. However, the changed eras changed the situation and enforced divergent ambitions in the order-to-delivery process. The technological properties of COP available to the actors were retained (use of modules, etc.) by intent even though in some instances the rules of the chimney model were changed. The changes made to data, such as orders, implied an adaptation of COP. The COP system was transformed and conformed to match Ford's way of handling production by enforcing costs. The status quo of COP was transformed.

The chimney model tended to reinforce COP by its routine application. The chimney model remained as a work practice in collaboration with EDI to secure flexibility in an interwoven structure of demand and supply. Implications of the model based on the technological conditions were that flexibility was used up, with adherent costs without customer benefits. Supply chain actors were averse to the number of late changes in orders. Adjustments to the tool were made in negotiations and manufacturing enforced limited flexibility while the changes in orders were unacknowledged conditions. However, structural consequences were seen in the debate after the engine chimney negotiations. The chimney model per se reinforced and preserved COP status quo in an automatic way.

These tier-wise consequences were unintended consequences of enactment (Orlikowski 2000), but as the consequences were acknowledged, they influenced the actors' process of intent (Giddens 1984). The situational consequences of actions are an essential assumption by Giddens that makes sense in the case of a supply chain's strategic development. In Jarzabkowski's study (2005), top management was seen as the origin of strategising. But if strategising is strategic acts that people do, then others in the supply chain (in addition to top managers) are important to the development (in line with Regnér 2003). Outcomes of strategising are situational consequences that make sense based on a set of acknowledged conditions and intended consequences. The consequences might have perverse outcomes that are based in strategic conduct contradiction or in the more severe structural contradiction because of differences in time, space and way of thinking (Giddens 1979). Some consequential structural contradictions that created differences were:

- Dealers were separated from upstream suppliers by lead time, location (these suppliers are often situated in low-cost countries) and way of thinking. The dealers' way of thinking related to competitive sales and the suppliers communicated coordination to manage demands of flexibility and efficiency. Thus, the structural properties of the supply chain were different in the chain, most evidently between supplier and

dealer. This relates to the degree of supply chain integration and the fact that the recurrent social practices of these supply chain actors were different in the order fulfilment process.

- The meaning of orders changed but was treated as if it had not changed. The number of negotiations regarding capacity and delivery plans increased but they were debated, at least when flexibility limits were crossed. Speculative sales created many changes in the near term. Changing prerequisites for different actors affected the order-to-delivery process by longer lead times, less priority to the customer, less flexibility by agreements and a cost focus that reduced the propensity to coordinate, to carry stock and to have extra capacity. These consequences were different in different places of the supply chain.
- Some actors needed to change, for example, to reduce costs. That strategic conduct had unintended consequences for flexibility and changed the structure of action.
- The coordination of the order-to-delivery process suffered through increased goal complexity and a restricted discussion of the order-to-delivery process development. Order fulfilment practices were hijacked for another objective undermining rather than reinforcing interaction for both lean and BTO, for example. Because the coordination between the industrial and the business part of the supply chain was limited, the industrial part retained BTO while the commercial part gave priority to LTO.
- The emphasised business logic was incongruent with the structure of actors that coordinated orders and deliveries. Volume growth was related to lower prices of pre-ordered cars and to innovation of premium products. A reason to make premium products is the higher prices. Thus, there is a need to maintain prices, which leads to smaller volumes and a need to sustain innovation, which increases cost per car. Pre-ordered cars combined with COP practices caused increased costs and problems.
- The supply chain comprised different logics of action. As social subsystems of industrial, business and service logic, the conditions and consequences differed dynamically as the situation changed. The systems were hardly socially integrated.
- An incentive system that encouraged dealers to order instead of letting the customer order counteracted the part of COP that permitted collaborative customisation. By that the customer orientation diminished regarding customer interaction and dealers worked less with customers to support the decision process.
- Basic characteristics of firms, as seen by laws and regulations, entail that actors should withhold autonomy, while COP is built on integration and dependency.

- Customisation depends on the interaction of customer-oriented firms and use-oriented customers, but their bases of action differ in logics.

The reproduction of the social system is important in order to understand strategic development. The dynamics of contradictions becomes motivation for action; however, the outcome is situational. The creative opportunity, however, is that the motivation might be shared and a source of reflexive monitoring among different actors. As long as the contradictions exist, they are likely to give perverse outcomes in the conduct of situated actors (Giddens 1984). It is logical that contradictions create conflicts. Giddens (1979) argues that these might be prevented by opacity of action in order to limit the consequences, dispersal of contradictions in order to avoid hot spots in overlapping contradictions, and direct repression to prevent conflict by, for example, norms.

Theoretical contribution

In the problem discussion I made reference to Gammelgaard (2004), who proposes sociological meta-theories as necessary to explore logistics and supply chain management issues, especially in relation to strategies and strategic implementation. As applied in this study of development, practice acts as in a zone among relevant research fields in order to learn about supply chain development. Thus, the theoretical contribution is partly the practice view and partly the multi-perspective approach that includes IMP research, strategy-as-practice research and SCM/logistics research. The integration of supply chain processes is explained as an emerging process of inter-organisational strategising that is dynamic and complex. Next, the theoretical contribution to each will be elaborated.

IMP

The interorganisational network makes strategic sense (Baraldi et al. 2007; Gadde et al. 2003), but few strategic implications are drawn from the body of knowledge. Baraldi et al. (2007) suggest a research agenda designed to bring the concepts and methods of industrial network research to bear upon strategy, strategising and the strategy process. In their analysis, they identify alignment of the assumptions and methods of IMP scholars to those of strategy-as-practice. While Harrison and Prenkert (2009) take off from the theoretical approach of IMP – activities, resources, actors (ARA) – and discuss network strategising trajectories of these, I took off from an idea and followed its development by effects. This is one of several sociology-influenced inquiries that choose a

practice approach for industrial marketing and purchasing issues (c.f. Araujo et al. 2008).

My study is a contribution to the IMP research by including the theory of structuration as a practice approach and by the special focus on strategising. Structuration theory has been investigated in relation to the model of ARA (Peters, Pressey and Johnston 2010) with too little attention to the peculiarity of action. The contribution of my study is the relation to the industrial system (Johanson and Mattsson 1992), rather than the network of ARA (Håkansson and Johanson 1992). The industrial system is a social system in line with Giddens's assumptions regarding a study of action. The Johanson and Mattsson model developed the notion of strategic position in relation to industrial networks, which is revitalised by dynamics and complexity from the practice approach. This model has served as a principle of industrial network relations. Then my contribution in relation to the original idea is inclusion of the performance of integration and of strategising based on the COP development.

Strategising or strategy-as-practice

Strategising involves processes and practices in which day-to-day activities of organisational life are related to strategic outcomes (Johnson et al. 2003). Understanding strategising should, however, involve not only organisational activities but also interorganisational activities in processes and practices. The contribution from this study relates the order-to-delivery process and COP practices to strategic outcomes. Regnér (e.g., 2003) found strategy-making to be different in the centre and in the periphery of an organisation. Regnér discussed the creative logic of strategising, which is needed in order to manage complex situations in addition to the basic adaptive strategy logics. In the supply chain, I might add that additional logics that relate to different actors are of importance (business, industrial and service provider logic). In addition to centre and peripheral organisational strategists, others have included middle managers, consultants and board of directors (Floyd and Lane 2000; Jarzabkowski et al. 2007; Samra-Fredericks 2003).

However, these actors are all included on an organisation's pay-roll. If the supply chain is seen as the strategic arena, then complementary issues become important for the strategic analysis. Content and process of strategic development become intertwined by practices. Also, Elter (2004) illustrates the importance of coordination and integration mechanisms, which also has bearing in an interorganisational context. My study contributes with knowledge of the strategic interactions in the supply chain and how strategising happens in the network. A supply chain is a specific social system and strategy-as-practice in such system involves more than daily strategic activities. Practice is an ongoing changing process that draws on enactment of context. Strategy as practice is an enacted concept that in the social system of a supply chain has subsystems with different logics but interconnected content issues, has close

interdependencies among organisations but still, on the business network/governance level enforce the strategic process in specific directions.

Strategy-as-practice researchers are concerned with content and process of strategic development (Jarzabkowski and Spee 2009; Johnson et al. 2007). Johnson et al. (2007:18) draw a research agenda (see Figure 12.1) as a map of strategic management in order to identify important research bridging the lower level of people's activities and the more macro levels of organisational and institutional practices that a strategy-as-practice approach needs to involve in a study. Jarzabkowski and Spee (2009) develop a typology of nine possible domains for strategy-as-practice research. What is common and exemplified with these two examples of strategy-as-practice is that strategy is seen as an intertwinement of content and process, of strategists, practices and praxis, and yet these elements are dissected in order to explain principles. A practice approach involves action in which micro/macro and content/process are enacted; the performance is key. Structuration theory is one way to accomplish that (see, e.g., Jarzabkowski 2008); the special contribution to strategy-as-practice is partly the arena of the supply chain for strategic development and supply chain strategising, and partly strategising with multiple strategies.

The actual practices making up a specific strategy are little discussed in strategy-as-practice: In Figure 12.1 (which will be further discussed in the next chapter) these are illustrated partly as actors' content activities in the form of coordination (see Elter 2004 for an exception) and strategic content activities of BTO (such as the chimney model) and effects of these in relation to the more general trend (in this case customisation). Outcomes relate to these activities and a structuration analysis engages in such effects. Thus, a contribution would be the exploration of effects in practice in order to learn about strategic outcomes.

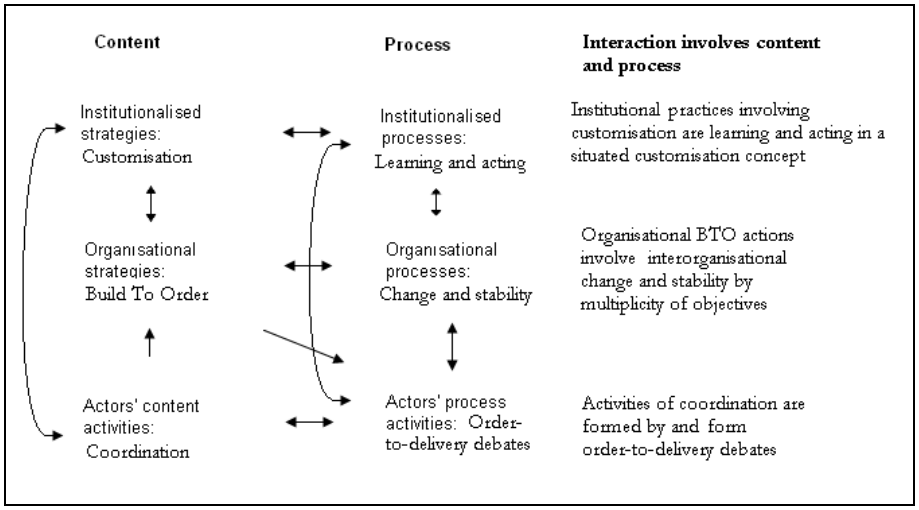


Figure 12.1 Strategic interactions in an interorganisational social system. Source: Adapted from Figure 1.1 in Johnson et al. (2007).

Another contribution to strategy-as-practice research is the application of Giddens's theory. Johnson et al. (2007) discuss bounding strategy-as-practice as problematic, because the unit of analysis is the concept of strategising that is open-ended and spread out over space and time. The logic of practice sidesteps the 'micro/macro' distinction (Chia and MacKay 2007), and does not follow predetermined categorisations (Kjellberg and Andersson 2003). Action forms the boundaries. However, strategy-as-practiceresearch has received criticism about its lack of coherence in relation to assumptions of the practice approach; studies are often re-labelled process studies (Carter et al. 2008; Chia and MacKay 2007; Gherardi 2009). Also, Whittington (2006) discusses the difficulties to integrate strategic activity and aggregate effects in studies (Whittington 2006). Giddens's work is often mentioned in strategy-as-practice research bet seldom used. Giddens' method is labelled as bracketing method (Langley 1999) and I have applied it in order to understand an outcome and temporal evolution where outcome and causes are reciprocally dependent. Strategy is practiced by many actors simultaneously and even though actions are unrelated to one another at a specific time actions might become related by interactions and negotiations.

SCM and logistics

The meta-theoretical sociological approach is a contribution in itself to logistics and SCM research, particularly within the knowledge development of logistics strategies and implementation (Gammelgaard 2004). The study contributes with insights into supply chain management practices, lean/agile strategies, integration and the industrial network. More specifically, the perspective gives

insights into supply chain conflicts and structural contradiction inherent in premises of SCM. The relationship between integration and strategising (see also Elter 2004) opens up for a dynamic view of integration, with implications for the study of supply chains. The specific practices of BTO are outlined in their principles. Also, insights into inherent differences between mass production and flexible production are added. Each paradigm involves specific practices in which conditions and consequences have developed to cope with complexity; some are of a general problem-solving character (Abrahamsson and Helin 2004), while others are developed in response to specific problems and combined by specific integration mechanisms in order to cope (Elter 2004). Other practices than those related to production are possible in order to change the degree of customisation (Gilmore and Pine II 1997; Lampel and Mintzberg 1996) What is more, the intersection of research involving supply chain management and strategic management is occupied by influences from perspectives giving static accounts of strategy (Burgess et al. 2006); strategy-as-practice is especially interesting to SCM because of the interest in complexity and dynamics of managerial everyday life. Others than top managers influence strategic directions. In practice, mergers and acquisitions are common and such events need to be accounted for by SCM research.

Logistics does not only take place within a system; its happening continuously interacts with other strategic initiatives, and the practice approach has merits for the study of action. By inclusion of strategising as a concept and a view of strategy making, dynamics and complexity relevance of results will increase. Relevance comes from learning of the concept in practice. The approach confronts claims that strategies need to be either efficient or responsive (Fisher 1997) by illustrating and analysing the inseparability of interacting practices of such strategies.

Chapter 13 - Implications

In the introduction to this dissertation I drew attention to COP, customer orientation and the nitty-gritty of logistics that have strategic implications and related this discussion to questions of practice. The practice-based supply chain strategising study has given an 'aha!' understanding of aspects involved, and in this final chapter I will take the contribution to theory and practice a step further for the purpose of learning and making a difference in research as well as in practice. In addition to the previous chapter of conclusion, a special contribution is situational generalities that matter, which relates to the methodological, theoretical and empirical contributions that I will elaborate on. Also, I will suggest further research as a consequence of what I am puzzled by after finishing this dissertation.

Practice of SCM strategies

Logistics of COP in practice demand an eagle eye and an iron grip, as was expressed by a top manager of Material Planning and Logistics. To get things done right and on time involves dispersed activities of firms and of actors including non-human automatic activities of, for example, EDI, and rules and resources. Detailed control is needed because of the complexity and dynamics of COP in practice. Rules of logistics may be of a general character but are specified and need to be interpreted into specifics in business exchanges, in order to make COP work.

The strategy of COP resonates with customer orientation and with Volvo as a premium brand. Over time, different kinds of problems and opportunities confronted Volvo Cars, and many parallel objectives and strategies co-existed. I have discussed the objectives that arose when Ford as a new owner cooperated with Volvo as influential to the development of COP. A cutback of customer order based cars by half was appropriate based on prioritised objectives of volume growth; however, diminished customer satisfaction was an unintended issue in the strategic development. A supply chain involves different actors, and multiple objectives are logical, which is demanding in terms of operative coordination. The impossibility of one strategy becomes clear in the complex situation of practice. Multiple objectives and strategies are like different structures that are enacted and in which one has to be in the foreground; at the same time, understanding of conditions and consequences of enactment to others is important for strategic development. Most of the existing rules and resources will be drawn upon in the enactment of the other structures.

The idea of COP develops with other upcoming ideas and is developed into a controlled structure of logistics. Whether new practices should be created to

handle upcoming ideas is to be decided on as a question of durability. The volume growth idea nestled into the existing structure, which had consequences for COP. If rules and resources mismatch, then a durable development is created by crafting new practices (Elter 2004). In the case of National Industrial Bicycle Company of Japan, two different systems were created (BTO and mass production), which supported multiple objectives by multiplying also key rules and resources and by learning of each other (Kotha 1996). Patterns of action need to be created that involve not only similar partners in the supply chain but also partners with different logics (cf. how the chimney model was adjusted for engine supply from a mass producer), in order to get processes of coordination that result in effective integration. Social integration based on face-to-face interaction is crucial for coordinating multiple objectives. Supply chain integration is in most cases an abstract concept that involves approximation of diverse issues, which is an evaluation in hindsight of a scenario.

Strategising involves details and abstraction, which are part of its complexity. See, for example, Figure 12.1 as a map of strategy as practice (Johnson et al. 2007). It shows two columns and three rows of relevant studies to carry out in order to outline practice of strategy. The practitioner needs to face this complexity in action, where different aspects are influential differently over time. A study of action should thereby by necessity be seen as situated and its outcomes are dependent on context. However, the figure might be discussed in general terms based on learning. Figure 12.1 illustrates that in the dichotomy between process and content, as presented in strategic management literature, these have close interdependencies across and between the levels (Johnson et al. 2007). For example, COP seen in an order-to-delivery process might be explained as follows:

- In the *process* of a COP order-to-delivery process, actors need to engage in continuous debates related to dynamics of orders and deliveries. The process needs to stand up to a multiplicity of objectives based on different supply chain actors, which results in change and stability in different aspects for the firms. Learning and acting are based on the development of conditions and consequences, which is institutionalised as lifelong learning (cf. Fridriksson 2008).
- *Content* issues related to COP are at actor level about coordination. The firm level enactment relates to principles of BTO, while the institutionalised COP is customisation.
- In *action* the actors coordinate logistics issues while reflecting on multiple objectives within a discourse of BTO and simultaneous change and stability in different issues where the outcome is learning and acting for customisation.

A practice approach is needed to understand action. Logistics are central in strategic development in practice but theorising about it has not been a theoretical issue. Figure 12.1 illustrates that COP-in-practice involves logistics,

organisational issues and institutional issues that without the practice view would be seen as six problems with few linkages. Therefore, the relevance of supply chain management, as well as strategic management theorising, would be strengthened by a practice perspective. Implications of a practice view refer to knowledge production (Gherardi 2009) by reflexive monitoring (Giddens 1979; 1984) that can be used to spur strategising as a reproduction of practices.

An inquiry that produces knowledge is based on knowing (Cook and Brown 1999). Knowing is from the happening, i.e. the reproduction of practice, and the outcome of this study. The empirical material is one basis for learning and the analytical interpretation together with conclusions is another that might form further strategising. Purposeful change by supply chain strategising takes off in the courage to debate with communication that is empowered and legitimately sanctioned (Giddens 1984). The debate is seen as a Volvo Cars strength, but as can be seen in the case description, the input to a debate might sometimes be problematic because influences to the debate are too narrow. Actually, the input to debates should be an outcome of research, because contextual generalities can be a source of questions that make sense for a wider population. For example, Håkansson and Ford (2002) use paradoxes of opportunities and threats, influencing and being influenced as well as control in the network in order to provide an answer to the question "How should companies interact in business networks?" The questions and paradoxes are of the kind that invites discussion and provides a basis of debate issues where the debate outcome is conclusions of relevance to the contextual debate. Next is an example of such questions while I set aside potential paradoxes for future research.

Questions that create understanding

It is the 29th of March, 2010; a historic signature and a historic handshake will give Volvo Cars a new future, according to press reports. In the autumn of 2010, Volvo Cars' new Chinese owner is Geely. Zhejiang Geely Holding Group is the parent company and the sister company is Geely Automobile Holdings. The grounder, Li Shufu and his family own the parent company and control the sister company. How will a new owner affect the development of Volvo?

-Volvo is Volvo and Geely is Geely, says Li Shufu. The Volvo organisation shall remain and probably be supplemented by local production in China for the local market. Volvo's partial integration with Ford, for example, regarding engines will be split up again. In the takeover, little is discussed when it comes to synergies, but Li Shufu stresses Volvo's growth potential.

-China is the world's biggest automobile market and Volvo gets a new access to it and growth potential.

Growth has been Volvo's long-term objective, and the new owner might facilitate that. The crucial question that arises is: What consequences might be

expected in Volvo's processes? The situation and the statements by Li Shufu are reminiscent of the now historical statements by Ford top managers.

Other questions of relevance relate to opposing logics in the supply chain and to multiplicity of strategies, among others, that make sense to readers and create learning. Departing from a social practice understanding findings are contextual. However, customer orientation, for example, is widely accepted as a desirable aim for organisations and customer-oriented strategies are in use in business, social and health sectors, just to mention few, the consequences of such strategies, which this thesis critically investigates, have large societal implications and insights from this thesis can in a reflective way be further used.

Reflections of the practice approach

I have used a multiparadigm approach, including ostensive and performative sources, in order to learn about supply chain strategising. In the preceding chapter; the contributions of and to the involved approaches were discussed. Gioia and Piotre (1990) argue that the multiparadigm approach offers the potential contribution *of* theory when applied to theory building within any given paradigm, and in a different sense, it also offers a contribution *to* theory because it fosters an awareness of multiple approaches to the theory-building process, with the consequent potential of constructing alternative theories. These analyses of ostensive and performative definitions of COP resulted in a discussion of how ostensive COP practices act and how the performative definition relied on dynamic integration in the industrial network.

The performative view draws on practice. The experience and the action come from everyday activities of logistics. The activities of coordination and integration are in the structuration both a medium and an outcome of the process. People's process of intent relates to social integration and is decisive for the development and is followed by system integration. The contribution of the practice view is paramount in this study. The contribution to the practice view is partly by application and partly by the investigations of consequences. A part of the analytical framework is built on Orlikowski's (2000) interpretation of the theory of structuration. Orlikowski studied technology in practice, which I expanded in a study of a concept in practice. As the theory of structuration is more often discussed than applied, the application of how action is formed and forms the duality of structure serves as a contribution to practice theory.

The supply chain serves as a case of a social system with its set of characteristics. Besides the application, the investigation of consequences is a contribution to any analysis of structuration. Consequences, conditions and action are essential to development, which was elaborated also by Orlikowski. However, Giddens (1979) especially outlines action, structure *and contradiction* as central problems but most analyses end by discussing consequences.

Consequences, conditions, action and contradictions are elaborated in relation to an industrial system in this thesis.

The study of practice has most often taken either an outside approach with an inquiry concentrating on regularity of practices or an inside approach from the point of view of the practitioners and the activity that is being performed. This study contributes to the 'practice lens' (Gherardi 2009), because it represents a third analytical level on which practice is viewed as the effect of a weaving-together of interconnections in action, or as a 'doing' of society (Gherardi 2009); it is an analysis of practices in terms of their deliberate and non-deliberate consequences as and when they are being practiced. Thus, the contribution to practice research is in the application of structuration theory, elaboration of contradictions that would increase relevance and in method of studying practices as effects as proposed by Gherardi in contrast to the more common way of following the action in action nets (Czarniawska 2004b) or to trace connections in actor networks (Latour 2005).

Deviations spurring further research

At Volvo Cars, planning was used to decide and make preparations regarding what to produce. COP had specific rules related to the chimney model. Orders and agreements between Volvo Cars' purchasers and suppliers' sales offices were negotiated. From this follows the order fulfilment process; EDI is used to automatically send information between supplier and buyer. The call-off message from the Volvo Cars plant to suppliers comprises earlier delivery schedules. The EDI routine is regulated and also negotiated in its usage situation. An interesting empirical matter is the interpretation process that the message creates among different suppliers. In case of changes, suppliers as well as transporters need to respond, and in order to learn how they do so and what happens with the routine and the use of it, it would be useful to interpret the technology in use (Feldman 2003; Feldman and Pentland 2003) from inside (Gherardi 2009). Going inside the interpretation process means to sympathise with the order message and identify with the character of its interactions in the supply chain. The experiences within and the identification with the message are purposeful for appreciating difference (change) by a more perceivable sensor (Tsoukas and Chia 2002).

Incentives played a role in the development of Volvo Cars' COP. Incentives were an important carrot for the sales force, but also a reason for the supply chain's extra costs of delivery in a COP. I would like to propose a study of critical investigation of incentives in their ostensive and performative definition. An ostensive definition of incentives is outlined in corporate governance literature and in guidelines and recommendations of corporate governance professionals, in order to foster responsible conduct. A performative definition

is lacking. The principles of governance need to be complemented by social practice.

Regulations are devices for conduct. I have discussed a structural contradiction in the supply chain concept that involves the Swedish competition legislation, applied in parallel with EU competition rules and safeguarded by the Swedish Competition Authority and the Market Court. The regulation and the SCM discourse talk about the same phenomena but have not communicated with each other. Their statements point to an underlying structural contradiction of the supply chain. The contradiction results in a conflict in some cases of coordination that firms undertake. Investigating coordination by interviewing employees of the Competition Authority, examining statements by members of the Market Court as well as court decisions (especially in borderline cases of what is an advantageous coordination of firms and what is anticompetitive behaviour) would be interesting areas of further research.

References

Abrahamsson, Gun and Sven Helin (2004), "Problemlösningsarbete på låg organisatorisk nivå: Två studier om implementering respektive konktretisering av idéer om kundorderstyrd tillverkning (Problem solving at a low organisational level: Two studies on implementation and institutionalisation of World Class Manufacturing ideas)," Doctoral Dissertation, Uppsala University.

Adler, Paul S., Barbara Goldoftas and David I. Levine (1999), "Flexibility versus efficiency? A case study of model changeovers in the Toyota Production System," Organization Science, 10 (1), 43-68.

Alderson, Wroe (1950), "Marketing efficiency and the principle of postponement," Cost and Profit Outlook, 3 (September), 15-18.

Alvesson, Mats (1995), Management of knowledge-intensive companies. Berlin: de Gruyter.

---- (2003), "Beyond neopositivists, romantics, and localists: A reflexive approach to interviews in organisational research," Academy of Management Review, 28 (1), 13-33.

Alvesson, Mats, Cynthia Hardy and Bill Harley (2008), "Reflecting on reflexivity: Reflexive textual practices in organization and management theory," Journal of Management Studies, 45 (3), 480-501.

Alvesson, Mats and Dan Kärreman (2000), "Taking the linguistic turn in organizational research: Challenges, responses, consequences," Journal of Applied Behavioral Science, 36 (2), 136-58.

---- (2007), "Constructing mystery: Empirical matters in theory development," Academy of Management Review, 32 (4), 1265-81.

Alvesson, Mats and Kaj Sköldberg (2000), Reflexive methodology: New vistas for qualitative research. London: Sage.

---- (2008), Tolkning och reflektion: Vetenskapsfilosofi och kvalitativ metod (2nd ed.). Lund: Studentlitteratur.

Anderson, James C. (2004), "From understanding to managing customer value in business markets," in *Rethinking Marketing - developing a new understanding of markets*, Håkan Håkansson and Alexandra Walnuszewski, eds. Chichester: Wiley.

Anderson, James C. and James A. Narus (2004), Business market management: Understanding, creating and delivering value. Upper Saddle River, N.J.: Prentice Hall.

Araujo, Luis, Hans Kjellberg and Rob Spencer (2008), "Market practices and forms: introduction to the special issue," Marketing Theory, 8 (1), 5-14.

Asplund, Johan (1970), Om undran inför samhället (Reflections on society). Lund: Argos.

Axelsson, Björn and Geoffrey Easton Eds. (1992), Industrial networks: a new view of reality. London: Routledge.

Bagchi, Prabir K, Byoung Chun, Tage Skjøtt-Larsen and Lars Boege Soerensen (2005a), "Supply chain integration: a European survey," The International Journal of Logistics Management, 16 (2), 275-94.

Bagchi, Prabir K, Byoung Chun Ha, Tage Skjøtt-Larsen and Lars Boege Soerensen (2005b), "Supply chain integration: a European survey," The International Journal of Logistics Management, 16 (2), 275-94.

Bagchi, Prabir K and Tage Skjøtt-Larsen (2003), "Integration of information technology and organizations in a supply chain," International Journal of Logistics Management, 14 (1), 89-108.

Balogun, Julia, Anne Sigismund Huff and Phyl Johnson (2003), "Three responses to the methodological challenges of studying strategizing," Journal of Management Studies, 40 (1), 197-224.

Baraldi, Enrico, Ross Brennan, Debbie Harrison, Annalisa Tunisini and Judy Zolkiewski (2007), "Strategic thinking and the IMP approach: A comparative analysis," Industrial Marketing Management, 36 (7), 879-94.

Barney, Jay B. and Asli M. Arikan (2001), "The resource-based view: Origins and implications," in *The Blackwell handbook of strategic management* Michael A. Hitt and R. Edward Freeman and Jeffrey S. Harrison, eds. Oxford: Blackwell Publishers.

Bartunek, Jean M., Sara L. Rynes and R. Duane Ireland (2006), "What makes management research interesting, and why does it matter?," Academy of Management Journal, 49 (1), 9-15.

Bechtel, Christian and Jayanth Jayaram (1997), "Supply Chain Management: A Strategic Perspective," International Journal of Logistics Management, 8 (1), 15-34.

Berard, Tim J. (2005), "Rethinking practices and structures," Philosophy of the Social Sciences, 35 (2), 196-230.

Bernardes, Ednilson Santos and Mark D. Hanna (2009), "A theoretical review of flexibility, agility and responsiveness in the operations management literature: Toward a conceptual definition of customer responsiveness," International Journal of Operations & Production Management, 29 (1), 30-53.

Bohlin, Johan and Tomas Hedbäck (2002), "Commonality: På vinst eller förlust?," Handelshögskolan vid Göteborgs Universitet.

Borgström, Benedikte (2005), "Exploring efficiency and effectiveness in the supply chain: A conceptual analysis," the 21st IMP Conference, Finn Wynstra (Ed.). Rotterdam.

---- (2009a), "Does performance matter?: A strategic view of industrial networks," the 25th IMP-conference (work in progress accepted)

---- (2009b), "The mystery of inter-organisational strategising," the 19th Annual Nordic Workshop on Interorganizational Research, Helen Andersson (Ed.). Jönköping.

---- (2009c), "The mystery of strategy of practice," the 9th Euram Conference, Terry McNulty (Ed.). Liverpool.

Borgström, Benedikte, Lianguang Cui and Susanne Hertz (2008), "Implications of offshoring: Co-development of sourcing and marketing," in *Recent developments in supply chain management*, René de Koster and Werner Delfmann, eds. Helsinki: Helsinki School of Economics.

Borgström, Benedikte and Susanne Hertz (2003), "ICT's Role for SMEs integration in supply chains - efficiency and effectiveness?," the 19th IMP Conference, Ivan Snehota (Ed.). Lugano.

---- (2006a), "Implications of power to supply chain management," the 18th Nofoma Conference, Marianne Jahre (Ed.). Oslo.

---- (2006b), "Power issues when integrating supply chains," the 22nd IMP Conference Francesca Golfetto and Robert Salle (Eds.). Milan.

---- (2007a), "Implications of supply chain monitoring," in *Managing Supply Chains: Challenges and Opportunities*, René de Koster and Werner Delfmann, eds. Copenhagen: Copenhagen Business Press.

---- (2007b), "Power issues when integrating supply chains," Financing, Marketing and Production, XXV(1) (Special issue), 78-100.

---- (2008a), "Kundorderstyrning - ett förvånansvärt trubbigt verktyg," in *Marknadsorientering – myter och möjligheter*, Lars-Gunnar Mattsson, ed. Lund: Liber.

---- (2008b), "Strategizing in industrial networks: Fallacies of customer order based production," the 24th IMP Conference, Alexandra Walnuszewski and Amjad Hadjikhani and Enrico Baraldi (Eds.). Uppsala.

---- (2009), "Challenges in customer order based production," the 21st Nofoma Conference, Susanne Hertz (Ed.). Jönköping.

Borgström, Benedikte, Susanne Hertz and Jens Hultman (2005a), "Challenges in the creation of supply chain transparency," the 17th Nofoma Conference, Britta Gammelgard and Tage Skjøtt-Larsen (Eds.). Copenhagen.

---- (2005b), "Reengineering B2B relations through supply chain monitoring," the 2nd Cems Seminar on Supply Chain Management, Rene´ De Koster and Werner Delfmann (Eds.). Riezlern.

Borgström, Benedikte, Susanne Hertz and Anna Nyberg (2007), "A tale of two entries: How Netto and Lidl entered the Swedish grocery market," the 23rd IMP Conference, Peter Naude (Ed.). Manchester.

---- (2008a), "Entry strategy and international retail operations," Nordic Retail and Wholesale Conference, Jens Nordfält and Ulf Johansson (Eds.). Norrtälje.

---- (2008b), "Integrating the grocery supply chain: Problems and opportunities," CeLS Workshop on Global Retail Supply Chain and Marketing Innovation, Susanne Hertz (Ed.). Jönköping.

Broberg, Oskar (2006), "Verkstadsindustri i globaliseringens tidevarv: En studie av SKF och Volvo 1970-2000," in Göteborg Papers in Economic History Vol. No. 5.

Brunsson, Nils (1981), Företagsekonomi, sanning eller moral?: Om det normativa i företagsekonomisk idéutveckling. Lund: Studentlitteratur.

Bryman, A. (2002), Samhällsvetenskapliga metoder. Malmö: Liber Ekonomi.

Bucklin, Christine B., Stephen P. DeFalco, John R. DeVincentis and John P. Lewis III (1996), "Are you tough enough to manage your channels?," The McKinsey Quarterly (1), 105-14.

Bucklin, L.P. (1965), "Postponement, speculation and the structure of distribution channels," Journal of Marketing Research, 2 (2), 26–31.

Burgess, Kevin, Prakash J. Singh and Rana Koroglu (2006), "Supply chain management: A structured literature review and implications for future research," International Journal of Operations & Production Management, 26 (7), 703-29.

Carter, Chris, Stewart R. Clegg and Martin Kornberger (2008), "So!apbox: editorial essays: Strategy as practice?," Strategic Organization, 6 (1), 83-99.

Cerruti, Corrado (2010), "The deceptive allure of agile practices," 10th EURAM Conference, Luca Gnan (Ed.). Rome.

Cheng, Liang-Chieh and Curtis M Grimm (2006), "The application of empirical strategic management research to supply chain management," Journal of Business Logistics, 27
(1), 1-56.

Chia, Robert and Brad MacKay (2007), "Post-processual challenges for the emerging strategy-as-practice perspective: Discovering strategy in the logic of practice," Human Relations, 60 (1), 217-42.

Chopra, Sunil and Peter Meindl (2001), Supply chain management: strategy, planning and operation. Upper Saddle River, NJ: Prentice Hall.

Christopher, Martin (1992), Logistics and supply chain management: Strategies for reducing costs and improving service. London: Pitman Publishing.

---- (2000), "The agile supply chain: Competing in volatile markets," Industrial Marketing Management, 29 (1), 37-44.

Christopher, Martin, Helen Peck and Denis Towill (2006), "A taxonomy for selecting global supply chain strategies," International Journal of Logistics Management, 17 (2), 277-87.

Christopher, Martin and Denis R Towill (2002), "Developing market specific supply chain strategies," International Journal of Logistics Management, 13 (1), 1-14.

Christopher, Martin and Denis R. Towill (2000), "Supply chain migration from lean and functional to agile and customised," Supply Chain Management: An International Journal, 5 (4), 206-13.

Colville, Ian D., Robert H. Waterman and Karl E. Weick (1999), "Organizing and the search for excellence: Making sense of the times in theory and practice," Organization, 6 (1), 129-48.

Cook, S.D.N. and James S. Brown (1999), "Bridging epistemologies: The generative dance between organizational knowledge and organisational knowing," Organization Science, 10 (4), 381-400.

Cooper, Martha C., Douglas M. Lambert and Janus D. Pagh (1997), "Supply chain management: More than a new name for logistics," International Journal of Logistics Management, 8 (1), 1-14.

Cox, Reavis and Charles S. Goodman (1956), "Marketing of housebuilding materials," Journal of Marketing, 21 (July 1956), 36-61.

Craighead, Christopher W., Joe B. Hanna, Brian J. Gibson and Jack R. Meredith (2007), "Research approaches in logistics: Trends and alternative future directions," International Journal of Logistics Management, 18 (1), 22-40.

Croom, Simon, Pietro Romano and Mihalis Giannakis (2000), "Supply chain management: An analytical framework for critical literature review," European Journal of Purchasing & Supply Management, 6 (1), 67-83.

Czarniawska, Barbara (1993), The three-dimensional organization: a constructionist view. Lund: Studentlitteratur.

---- (1997), Narrating the organization. Dramas of institutional identity. Chicago: The University of Chicago Press.

---- (2004a), Narratives in social science research. London: Sage.

---- (2004b), "On time, space and action nets," Organization, 11 (6), 773-91.

---- (2008), "Organizing: how to study it and how to write about it," Qualitative Research in Organizations and Management: An International Journal, 3 (1), 4-20.

Da Silveira, Giovani and Nigel Slack (2001), "Exploring the trade-off concept " International Journal of Operations & Production Management, 21 (7), 949-64.

Dahlsten, Fredrik (2004), "Managing customer knowledge: Towards market orientation and innovation in an automotive organisation," Doctoral Dissertation, Fenix Research Program, Chalmers tekniska högskola.

Dahlsten, Fredrik, Alexander Styhre and Mats Williander (2005), "The unintended consequences of management by objectives: The volume growth target at Volvo Cars," Leadership & Organizational development journal, 26 (7), 529-41.

Dam Jespersen, Birgit and Tage Skjøtt-Larsen (2005), Supply chain management: In theory and practice. Copenhagen: CBS Press.

Drucker, Peter Ferdinand (1946), Concept of the corporation. New York: The John Day Company.

Dubois, Anna and Lars-Erik Gadde (2002), "Systematic combining: An abductive approach to case research," Journal of Business Research, 55 (7), 553-60.

Dubois, Anna and Michael Gibbert (2010), "From complexity to transparency: managing the interplay between theory, method and empirical phenomena in IMM case studies," Industrial Marketing Management, 39 (1), 129-36.

Dubois, Anna, Kajsa Hulthén and Ann-Charlott Pedersen (2004), "Supply chains and interdependence: a theoretical analysis," Journal of Purchasing and Supply Management, 10 (1), 3-9.

Duray, Rebecca (1997), "Mass customization configurations: An empirical investigation of manufacturing practices of customization," Doctoral Dissertation, Ohio State University.

---- (2002), "Mass customization origins: Mass or custom manufacturing?," International Journal of Operations & Production Management, 22 (3), 314-28.

Dutton, Jane E. and Janet M. Dukerich (2006), "The relational foundation of research: An underappreciated dimension of interesting research," Academy of Management Journal, 49 (1), 21-26.

Easton, Geoffrey (1992), "Industrial networks: a review," in *Industrial networks: a new view of reality*, Björn Axelsson and Geoffrey Easton, eds. London: Routledge.

Ebrahimpur, Golaleh (2002), "Changing in large firms: Aligning change and agility," Doctoral Dissertation, Fenix Research Program, Chalmers University of Technology.

Elkjaer, Bente (2004), "Organizational learning: The 'third way'," Management Learning, 35 (4), 419-34.

Elter, Frank (2004), "Strategizing in complex contexts," Doctoral Dissertation, BI.

Ericson, Mona (2008), "As in the composition of a fugue: Capturing the flow of strategic business activities," International Journal of Qualitative Methods, 7 (2), 58-76.

Essig, Michael and Ulli Arnold (2001), "Electronic procurement in supply chain management: An information economics-based analysis of electronic markets," Journal of Supply Chain Management, 37 (4), 43-49.

Fabbe-Costes, Nathalie and Marianne Jahre (2007), "Supply chain integration improves performance: The Emperor's new suit?," International Journal of Physical Distribution & Logistics Management, 37 (10), 835-55.

Fawcett, Stanley E. and Gregory M. Magnan (2002), "The rhetoric and reality of supply chain integration," International Journal of Physical Distribution & Logistics Management, 32 (5), 339-61.

Feitzinger, Edward and Hau L. Lee (1997), "Mass customization at Hewlett-Packard: The power of postponement," Harvard Business Review 75 (1), 116-21.

Feldman, Martha S. (2003), "A performative perspective on stability and change in organizational routines," Industrial and Corporate Change, 12 (4), 727-52.

Feldman, Martha S. and Brian T. Pentland (2003), "Reconceptualizing organizational routines as a source of flexibility and change," Administrative Science Quarterly, 48 (1), 94-118.

Ferdows, Kasra and Arnoud De Meyer (1990), "Lasting improvements in manufacturing performance: In search of a new theory," Journal of Operations Management, 9 (2), 168-84.

Fisher, Marshall L. (1997), "What is the right supply chain for your product?," Harvard Business Review, 75 (2), 105-16.

Floyd, Steven W. and Peter J. Lane (2000), "Strategizing throughout the organization: Management role conflict in strategic renewal," Academy of Management Review, 25 (1), 154-77.

Flynn, Barbara B. and E. James Flynn (2004), "An exploratory study of the nature of cumulative capabilities," Journal of Operations Management, 22 (5), 439-57.

Flynn, Barbara B., Roger G. Schroeder and E. James Flynn (1999), "World class manufacturing: an investigation of Hayes and Wheelwright's foundation," Journal of Operations Management, 17 (3), 249-69.

Fredriksson, Peter (2002), "A framework for analyzing the operative performance of sequential module flows," Doctoral Dissertation, Chalmers University of Technology.

Fridriksson, Helgi-Valur (2008), "Learning processes in an inter-organizational context: A study of krAft project," Doctoral Dissertation, Jönköping International Business School.

Fugate, Brian, Funda Sahin and John T Mentzer (2006), "Supply chain management coordination mechanisms," Journal of Business Logistics, 27 (2), 129.

Gadde, Lars-Erik, Lars Huemer and Håkan Håkansson (2003), "Strategizing in industrial networks," Industrial Marketing Management, 32 (5), 357-64.

Gadde, Lars-Erik and Håkan Håkansson (1992), "Analysing change and stability in distribution channels – a network approach," in *Industrial networks: a new view of reality*, Björn Axelsson and Geoffrey Easton, eds. London: Routledge.

Gammelgaard, Britta (2004), "Schools in logistics research?: A methodological framework for analysis of the discipline," International Journal of Physical Distribution & Logistics Management, 34, 479-91.

Gattorna, J. L. and D.W. Walters (1996), Managing the supply chain: a strategic perspective. London: Macmillan.

Geertz, Clifford (1973), "Thick description: toward an interpretive theory of culture," in *The interpretation of cultures: selected essays*. New York: Basic Books.

Gherardi, Silvia (2009), "Introduction: The critical power of the 'practice lens'," Management Learning, 40 (2), 115–28.

Ghoshal, Sumantra (2005), "Bad management theories are destroying good management practices," Academy of Management Learning & Education, 4 (1), 75-91.

Gibson, Brian J, John T Mentzer and Robert L Cook (2005), "Supply chain management: the pursuit of a consensus definition," Journal of Business Logistics, 26 (2), 17-25.

Giddens, Anthony (1979), Central problems in social theory: Action, structure, and contradiction in social analysis. Berkeley: University of California Press.

---- (1984), The constitution of society: Outline of the theory of structuration. Cambridge: Polity Press.

Gilmore, James H. and B. Joseph Pine II (1997), "The four faces of mass customization," Harvard Business Review, 75 (1), 91-101.

Gioia, Dennis A. and Evelyn Pitre (1990), "Multiparadigm perspectives on theory building," Academy of Management Review, 15 (4), 584-602.

Giunipero, Larry C., Robert E. Hooker, Sacha Joseph-Matthews, Tom E. Yoon and Susan Brudvig (2008), "A decade of SCM literature: Past, present and future implications," Journal of Supply Chain Management, 44 (4), 66-86.

Glaser, B.G. and A.L. Strauss (1967), The discovery of grounded theory. London: Weidenfeld and Nicholson.

Goldman, Steven L. and Roger N. Nagel (1993), "Management, technology and agility: The emergence of a new era in manufacturing," International Journal of Technology Management, 8 (1/2), 18-38.

Goldsby, Thomas J., Stanley E. Griffis and Anthony S. Roath (2006), "Modeling lean, agile, and leagile supply chain strategies," Journal of Business Logistics, 27 (1), 57-80.

Gunasekaran, Angappa (2005), "The build-to-order supply chain (BOSC): A competitive strategy for 21st century," Journal of Operations Management, 23 (5), 419-22.

Gunasekaran, Angappa and E. W. T. Ngai (2004), "Information systems in supply chain integration and management," European Journal of Operational Research, 159 (2), 269-95.

Gunasekaran, Angappa and E.W.T. Ngai (2005), "Build-to-order supply chain management: a literature review and framework for development," Journal of Operations Management, 23 (5), 423-51.

Hall, Annika (2003), "Strategising in the context of genuine relation: An interpretative study of strategic renewal through family interaction," Doctoral Dissertation, Jönköping International Business School.

Hallström, Anders (2005), "Car distribution organization: strategic issues in four configurations," Doctoral Dissertation, Linköpings University.

Harland, C.M. and L.A. Knight (2001), "Supply network strategy: Role and competence requirements," International Journal of Operations & Production Management, 21 (4), 476-89.

Harland, Christine M. (1996a), "Supply chain management: Relationships, chains and networks," British Journal of Management, 7 (1), S63-S80.

---- (1996b), "Supply network strategies: The case of health supplies," European Journal of Purchasing & Supply Management, 2 (4), 183-92.

Harrison, Debbie and Lars Huemer (2005), "Boundaries, inter-organisational routines and change," the 21st IMP-conference, Finn Wynstra (Ed.). Rotterdam.

Harrison, Debbie and Frans Prenkert (2009), "Network strategising trajectories within a planned process," Industrial Marketing Management, 38 (6), 662-70.

Hatch, Mary Jo and Dvora Yanow (2008), "Methodology by metaphor: Ways of seeing in painting and research," Organization Studies, 29 (01), 23-44.

Hayes, Robert H. and Steven C. Wheelwright (1984), Restoring our competitive edge: Competing through manufacturing. New York: Wiley.

Hayes, Robert H., Steven C. Wheelwright and Kim B. Clark (1988), Dynamic manufacturing: Creating the learning organization. New York: Free Press.

Hellberg, Roland (1992), "Inbound logistics: improvement strategies and barriers for synchronized supply," Linköping University.

Hertz, Susanne (1992), "Towards more integrated industrial systems," in *Industrial networks: a new view of reality*, Björn Axelsson and Geoffrey Easton, eds. London: Routledge.

---- (1993), "The internationalization processes of freight transport companies: towards a dynamic network model of internationalization," Doctoral Dissertation, Stockholm School of Economics.

---- (1999), "Strategic change processes in purchasing, distribution and transportation and their effects on the supply chain," in HSFR Report. Stockholm.

---- (2001), "Dynamics of alliances in highly integrated supply chain networks," International Journal of Logistics, 4 (2), 237-56.

---- (2006), "Supply chain myopia and overlapping supply chains," Journal of Business & Industrial Marketing, 21 (4), 208-17.

Hertz, Susanne, Johny K. Johansson and Flip de Jager (2001), "Customer-oriented cost cutting: process management at Volvo," Supply Chain Management: An International Journal, 6 (3), 128-41.

Hill, Terry (1993), Manufacturing strategy: Text and cases (2nd ed.). London: Macmillan.

Hines, Peter, Matthias Holweg and Nick Rich (2004), "Learning to evolve: A review of contemporary lean thinking," International Journal of Operations & Production Management, 24 (10), 994-1011.

Holweg, Matthias (2002), "The three-day car challenge: Investigating the inhibitors of responsive order fulfilment in new vehicle supply systems," Unpublished Ph.D. thesis, Cardiff Business School.

---- (2003), "The three-day car challenge: Investigating the inhibitors of responsive order fulfilment in new vehicle supply systems," International Journal of Logistics: Research & Applications, 6 (3), 165-83.

Holweg, Matthias and Frits K. Pil (2001), "Successful build-to-order strategies start with the customer," MIT Sloan Management Review, 43 (1), 74-83.

---- (2004), The second century: Reconnecting customer and value chain through build-to-order: Moving beyond mass and lean production in the auto industry. London: The MIT Press.

---- (2008), "Theoretical perspectives on the coordination of supply chains," Journal of Operations Management, 26 (3), 389-406.

Huff, Anne Sigismund (2009), Designing research for publication. Thousand Oaks, CA: Sage.

Hulthén, Kajsa (2002), "Variety in distribution networks: A transvection analysis," Doctoral Dissertation, Chalmers University of Technology.

Håkansson, Håkan (1982), International marketing and purchasing of industrial goods: An interaction approach. Chichester: Wiley.

Håkansson, Håkan and David Ford (2002), "How should companies interact in business networks?," Journal of Business Research, 55 (2), 133-39.

Håkansson, Håkan and Jan Johanson (1992), "A model of industrial networks," in *Industrial networks: a new view of reality*, Björn Axelsson and Geoffrey Easton, eds. London: Routledge.

Håkansson, Håkan and Göran Persson (2004), "Supply chain management: The logic of supply chains and networks," International Journal of Logistics Management, 15 (1), 11-26.

Håkansson, Håkan and Ivan Snehota (2006), "No business is an island: The network concept of business strategy," Scandinavian Journal of Management, 22 (3), 256-70.

Hällgren, Markus (2009), "Avvikelsens mekanismer: Observationer av projekt i praktiken (Mechanisms of deviations)," Doctoral Dissertation, Umeå University.

Jarzabkowski, Paula (2003), "Strategic practices: An activity theory perspective on continuity and change," Journal of Management Studies, 40 (1), 23-55.

---- (2005), Strategy as practice: An activity-based approach. London: Sage.

---- (2008), "Shaping strategy ac a structuration process," Academy of Management Journal, 51 (4), 621-50.

Jarzabkowski, Paula, Julia Balogun and David Seidl (2007), "Strategizing: The challenges of a practice perspective," Human Relations, 60 (1), 5-27.

Jarzabkowski, Paula and Andreas Paul Spee (2009), "Strategy-as-practice: A review and future directions for the field," International Journal of Management Reviews, 11 (1), 69-95.

Jensen, Leif-Magnus (2009), "The role of intermediaries in evolving distribution contexts: A study of car distribution," Doctoral Dissertation, BI Norwegian School of Management.

Johanson, Jan and Lars-Gunnar Mattsson (1987), "Interorganizational relations in industrial systems: A network approach compared with the transaction-cost approach," International Studies of Management and Organisation, 17 (1), 34-48.

---- (1992), "Network positions and strategic action: an analytical framework," in *Industrial networks: A new view of reality*, Björn Axelsson and Geoffrey Easton, eds. London: Routledge.

Johansson, Jenny and Åsa Lundmark (2006), "Product development with customer focus: charting and analysis of processes concerning market information input to the product development system at Volvo Car Corporation," Luleå tekniska universitet.

Johnson, Gerry, Ann Langley, Leif Melin and Richard Whittington (2007), Strategy as practice: Research directions and resources. Cambridge: Cambridge University Press.

Johnson, Gerry, Leif Melin and Richard Whittington (2003), "Guest editor's introduction: Micro strategy and strategizing: Towards an activity-based view," Journal of Management Studies, 40 (1), 3-22.

Kaplan, Michael (2002), "Acquisition of electronic commerce capability: The cases of Compaq and Dell in Sweden," Doctoral Dissertation, Stockholm School of Economics.

Kaspersen, Lars Bo (2000), Anthony Giddens: An introduction to a social theorist. Oxford: Blackwell.

Ketchen Jr., David J. and Larry C. Giunipero (2004), "The intersection of strategic management and supply chain management," Industrial Marketing Management, 33 (1), 51-56.

Ketokivi, Mikko and Roger Schroeder (2004), "Manufacturing practices, strategic fit and performance: A routine-based view," International Journal of Operations & Production Management, 24 (2), 171-91.

Kinch, Nils (1991), "Managing strategic illusions : the Volvo strategy in retrospect," Vol. 1991:8 in Working paper ISSN 0280-1604. Uppsala: Uppsala universitet.

---- (1993), "The road from dreams of mass production to flexible specialization: American influences on the development of the Swedish automobile industry 1920-1939," in Working paper series 1993, Mats Forsgren (Ed.). Uppsala: Företagsekonomiska institutionen.

Kingfisher, Catherine P. and Ann V. Millard (1998), ""Milk makes me sick but my body needs it": Conflict and contradiction in the establishment of authoritative knowledge," Medical Anthropology Quarterly, 12 (4), 447-66.

Kjellberg, Hans and Per Andersson (2003), "Where is the action? The reconstruction of action in business narratives," in *Evaluating marketing actions and outcomes*, Arch G. Woodside, ed. Vol. 12. Oxford: Elsevier.

Kohn Rådberg, Kamilla (2005), "Continuous change in mature firms," Doctoral Dissertation, Chalmers University of Technology.

Koste, Lori L. and Manoj K. Malhotra (2000), "Trade-offs among the elements of flexibility: a comparison from the automotive industry," Omega, 28 (6), 693-710.

Kotha, Suresh (1995), "Mass customization: Implementing the emerging paradigm for competitive advantage," Strategic Management Journal, 16 (S1), 21-42.

---- (1996), "From mass production to mass customization: The case of the National Industrial Bicycle Company of Japan," European Management Journal, 14 (5), 442-50.

Krishnamurthy, Rajesh and Charlene A. Yauch (2007), "Leagile manufacturing: a proposed corporate infrastructure," International Journal of Operations & Production Management, 27 (6), 588-604.

Kumar, Nirmalaya (2000), "The power of trust in Manufacturer-retailer relationships," Harvard Business Review, 74 (6), 92-109.

Lambert, Douglas M. and Martha C. Cooper (2000), "Issues in Supply Chain Management," Industrial Marketing Management, 29 (1), 65-83.

Lambert, Douglas M., Martha C. Cooper and Janus D. Pagh (1998), "Supply Chain Management: Implementation Issues and Research Opportunities," International Journal of Logistics Management, 9 (2), 1-19.

Lamming, Richard (1996), "Squaring lean supply with supply chain management," International Journal of Operations & Production Management, 16 (2), 183-96.

Lampel, Joseph and Henry Mintzberg (1996), "Customizing customization," Sloan Management Review, 38 (1), 21-30.

Langley, Ann (1999), "Strategies for theorizing from process data," Academy of Management Review, 24 (4), 691-710.

Larson, Paul D. and Dale S. Rogers (1998), "Supply chain management: Definition, growth and approaches," Journal of Marketing Theory and Practice, 6 (4), 1-5.

Latour, Bruno (1986), "The powers of association," in *Power, action and belief : A new sociology of knowledge?*, John Law, ed. London: Routledge & Kegan Paul.

---- (1996), Aramis or the love of technology (Catherine Porter, Trans.). Cambridge, MA.: Harvard University Press.

---- (2005), Reassembling the social: An introduction to actor-network-theory. New York: Oxford.

Law, John (2004), After method: Mess in social science research. London: Routledge.

---- (2007), "Actor network theory and material semiotics," available at http://www.heterogeneities.net/publications, downloaded 20 January, 2010.

Lee, Hau L. (2002), "Aligning supply chain strategies with product uncertainties," California Management Review, 44 (3), 105-19.

Lekvall, Per, Clas Wahlbin and Per Frankelius (2001), Information för marknadsföringsbeslut (4 ed.). Göteborg IHM.

Lewin, Kurt (1945), "The research center for group dynamics at Massachusetts Institute of Technology," Sociometry, 8 (2), 126-36.

Liljegren, Göran (1988), "Interdependens och dynamik i långsiktiga kundrelationer," Doctoral dissertation, Stockholm School of Economics.

Lindblom, Charles E. (1959), "The science of "muddling through"," Public Administration Review, 19 (2), 79-88.

Liu, Hong, Lars-Uno Roos and Robin Wensley (2004), "The dynamics of business orientation: The case of the Volvo Car Corporation," Industrial Marketing Management, 33 (4), 333-44.

Llewellyn, Sue and Deryl Northcott (2007), "The "singular view" in management case studies," Qualitative Research in Organizations and Management: An International Journal, 2 (3), 194-207.

Lundbäck, Magnus (2002), "Ford Motor Company's acquisition of Volvo Cars: the R&D integration process problems and problem areas," Licentiate thesis, Luleå Tekniska Universitet.

---- (2004), "Managing the R&D integration process after an acquisition: Ford Motor Company's acquisition of Volvo Cars " Doctoral Dissertation, Luleå Teknisa Universitet.

March, James G. and Robert I. Sutton (1997), "Organizational performance as a dependent variable," Organization Science, 8 (6), 698-706.

Mason-Jones, Rachel, Ben Naylor and Denis R. Towill (2000a), "Engineering the leagile supply chain," International Journal of Agile Management Systems, 2 (1), 54-61.

---- (2000b), "Lean, agile or leagile? Matching your supply chain to the marketplace," International Journal of Production Research, 38 (17), 4061-70.

Melin, Leif (1985), "Strategies in managing turnaround," Long Range Planning, 18 (1), 80-86.

---- (1987), "The field-of-force metaphor: A study in industrial change," International Studies of Management & Organization, XVII (1), 24-33.

---- (1992), "Internationalization as a strategy process," Strategic Management Journal, 13 (S2), 99-118.

Mentzer, John T., William Dewitt, James S .Keebler, Soonhong Min, Nancy W. Nix, Carlo D. Smith and Zach G. Zacharia (2001a), "Defining supply chain management," Journal of Business Logistics, 22 (2), 1-25.

Mentzer, John T., William Dewitt, James S. Keebler, Soonhong Min, Nancy W. Nix, Carlo D. Smith and Zach G. Zacharia (2001b), "Defining supply chain management," Journal of Business Logistics, 22 (2), 1-25.

Mikaelsson, Jon (2004), "Developing managerial work: A system and work-flow approach," Doctoral Dissertation, Fenix Research Program, Chalmers University of Technology.

Mintzberg, Henry (1979), The structuring of organizations. A synthesis of the research. New Jersey: Prentice-Hall, Inc.

Mintzberg, Henry, Bruce Ahlstrand and Joseph Lampel (1998), Strategy safari: a guided tour through the wilds of strategic management. London: Prentice Hall.

Mintzberg, Henry and James A. Waters (1985), "Of strategies, deliberate and emergent," Strategic Management Journal, 6 (3), 257-72.

Morash, Edward A (2001), "Supply chain strategies, capabilities, and performance," Transportation Journal, 41 (1), 37-54.

New, Steve (2004), "Supply chains: Construction and legitimation," in *Understanding supply chains: Concepts, critiques, and futures* Steve New and Roy Westbrook, eds. Oxford: Oxford University Press.

New, Steve and Roy Westbrook Eds. (2004), Understanding supply chains : Concepts, critiques and futures. Oxford: Oxford University Press.

Nilsson, Fredrik (2005), "Adaptive logistics: using complexity theory to facilitate increased effectiveness in logistics," Doctoral Dissertation, Lund University.

Nordqvist, Mattias (2005), "Understanding the role of ownership in strategizing: A study of family firms," Doctoral Dissertation, Jönköping International Business School.

Odette (2003), "Supply Chain Monitoring V. 1.0. Industry recommendations, downloaded as "SCMo Recommendation.zip"," (accessed 22 September, 2004).

Olhager, Jan (2003), "Strategic positioning of the order penetration point," International Journal of Production Economics, 85 (3), 319-29.

Orlikowski, Wanda J. (2000), "Using technology and constituting structures: A practice lens for studying technology in organizations," Organization Science, 11 (4), 404-28.

---- (2001), "Improvising organizational transformation over time: A situated change perspective," in *Organizational improvisation*, Ken N. Kamoche and Miguel Pina e Cunha and João Vieira da Cunha, eds. London: Routledge.

Orlikowski, Wanda J., JoAnne Yates, Kazuo Okamura and Masayo Fujimoto (1995), "Shaping electronic communication: The metastructuring of technology in the context of use," Organization Science, 6 (4), 423-44.

Parment, Anders (2006), Distributionstrategier: Kritiska val på konkurrensintensiva marknader. Malmö: Liber.

Peck, Helen and Uta Juttner (2000), "Strategy and relationships: Defining the interface in supply chain contexts," International Journal of Logistics Management, 11 (2), 33-44.

Perrotta, Manuela (2010), "Situated practices as the locus of technological change," in *Beyond knowledge management: Sociomaterial and sociocultural perspectives within management research*, S. Jordan and H. Mitterhofer, eds. Innsbruck: Innsbruck University Press.

Persson, Magnus (2004), "Managing the modularization of complex products," Doctoral Dissertation, Institutionen för arbetsorganisation, Chalmers tekniska högskola.

Persson, Ulrika (1997), "A conceptual and empirical examination of the management concept supply chain management," Licentiate Thesis, Luleå Tekniska Universitet.

Peters, Linda D., Andrew D. Pressey and Wesley J. Johnston (2010), "Sociology, structuration and understanding business networks," the 26th IMP Conference, Tibor Mandják (Ed.). Budapest.

Pettigrew, Andrew M. (1992), "The character and significance of strategy process research," Strategic Management Journal, 13 (S2), 5-16.

---- (1997), "What is a processual analysis?," Scandinavian Journal of Management, 13 (4), 337-48.

Pfeffer, Jeffrey and Gerald R. Salancik (1978), The external control of organizations: a resource dependence perspective. New York: Harper & Row.

Pil, Frits K and Matthias Holweg (2004), "Linking product variety to order-fulfillment strategies," Interfaces, 34 (5), 394-403.

Porter, Michael E (1985), Competitive advantage: Creating and sustaining superior performance. New York: Free Press.

Quinn, James Brian (1980), Strategies for change: Logical incrementalism. Homewood, IL.: R.D. Irwin.

Ragin, Charles C. and H. S. Becker Eds. (1992), What is a case? Exploring the foundations of social inquiry. Cambridge: Cambridge University Press.

Regnér, Patrick (1999), "Strategy creation in complexity-adaptive and creative learning dynamics," Doctoral Dissertation, Stockholm School of Economics.

---- (2003), "Strategy creation in the periphery: Inductive versus deductive strategy making," Journal of Management Studies, 40 (1), 57-82.

---- (2005), "Adaptive and creative strategy logics in strategy processes," in *Strategy Process*, Vol. 22, Advances in Strategy Management. Amsterdam: Emerald Group.

---- (2008), "Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy," Human Relations, 61 (4), 565-88.

Reichhart, Andreas and Matthias Holweg (2007), "Creating the customer-responsive supply chain: A reconciliation of concepts," International Journal of Operations & Production Management, 27 (11), 1144 - 72.

Ritter, Thomas, Ian F. Wilkinson and Wesley J. Johnston (2004), "Managing in complex business networks," Industrial Marketing Management, 33 (175-183).

Rudberg, Martin and Joakim Wikner (2004), "Mass customization in terms of the customer order decoupling point," Production Planning & Control, 15 (4), 445 - 58.

Samra-Fredericks, Dalvir (2003), "Strategizing as lived experience and strategists' everyday efforts to shape strategic direction," Journal of Management Studies, 40 (1), 141-74.

Sandberg, Erik (2007), "The role of top management in supply chain management practices," Doctoral Dissertation, Linköping University.

Sarkis, Joseph and Srinivas Talluri (2004), "Evaluating and selecting e-commerce software and communication systems for a supply chain," European Journal of Operational Research, 159, 318-29.

Schary, Philip B. and Tage Skjøtt-Larsen (2001), Managing the global supply chain. Copenhagen: Copenhagen Business School Press.

Schatzki, Theodore R. (2005), "Peripheral vision: The sites of organizations," Organization Studies, 26 (3), 465-84.

Schatzki, Theodore R. (2000), "Practice theory," in *Practice turn in contemporary theory*, Theodore R. Schatzki and K. Knorr-Cetina and Eike Savigny, eds.: Routledge.

Schmenner, Roger W. and Morgan L. Swink (1998), "On theory in operations management," Journal of Operations Management, 17 (1), 97-113.

Schroeder, Roger G. (2008), "Introduction to the special issue on theory development in operations management," Production and Operations Management 17 (3), 354-56.

Schultz, Majken and Mary Jo Hatch (1996), "Living with multiple paradigms: The case of paradigm interplay in organizational culture studies," Academy of Management Review, 21 (2), 529-57.

Scott, W. Richard (2003), Organizations: rational, natural, and open systems (5th ed.). Upper Saddle River, N.J.: Prentice Hall.

Sebastiao, Helder J and Susan Golicic (2008), "Supply chain strategy for nascent firms in emerging technology markets," Journal of Business Logistics, 29 (1), 75-91.

Selldin, Erik (2005), "Supply chain design: Conceptual models and empirical analyses," Doctoral Dissertation, Linköping Institute of Technology.

Selldin, Erik and Jan Olhager (2007), "Linking products with supply chains: Testing Fisher's model," Supply Chain Management: An International Journal, 12 (1), 42-51.

Setterberg, Sten (2008), "Filtrerad effektivitet: Möjliggörare för organisatorisk utveckling (Filtered efficiency: Enablers for organizational development)," Licentiatavhandling (sammanfattning) Chalmers tekniska högskola.

Skinner, Wickham (1969), "Manufacturing: Missing link in corporate strategy," Harvard Business Review, 47 (3), 136-45.

Skjøtt-Larsen, Tage (1999a), "Interorganisational relations from a supply chain management point of view," Logistik Management, 2 (2), 96-108.

---- (1999b), "Supply chain management: A new challenge for researchers and managers in logistics," International Journal of Logistics Management, 10 (2), 41-53.

Spens, Karen M and Anu H Bask (2002), "Developing a framework for supply chain management," International Journal of Logistics Management, 13 (1), 73-88.

Stank, Theodore P, Beth R Davis and Brian S Fugate (2005), "A strategic framework for supply chain oriented logistics," Journal of Business Logistics, 26 (2), 27-45.

Stern, Louis W., Adel I. El-Ansary and James R. Brown (1992), "Administrative patterns in marketing channels," in *Management in Marketing Channels*, Louis W. Stern and Adel I. El-Ansary and James Brown, eds. Englewood Cliffs: Prentice Hall.

Storey, John, Caroline Emberson, Janet Godsell and Alan Harrison (2006), "Supply chain management: Theory, practice and future challenges," International Journal of Operations & Production Management, 26 (7), 754-74.

Storey, John, Caroline Emberson and David Reade (2005), "The barriers to customer responsive supply chain management," International Journal of Operations & Production Management, 25 (3/4), 242-60.

Stratton, Roy and Roger D. H. Warburton (2006), "Managing the trade-off implications of global supply," International Journal of Production Economics, 103 (2), 667-79.

Stratton, Roy and Roger D.H. Warburton (2003), "The strategic integration of agile and lean supply " International Journal of Production Economics, 85 (2), 183-98.

Sutton, R. I. and Barry M. Staw (1995), "What Theory is Not," Administrative Science Quarterly, 40 (3), 371-84.

Svensson, Göran (2003), "Holistic and cross-disciplinary deficiencies in the theory generation of supply chain management," Supply Chain Management: An International Journal, 8 (4), 303-16.

Tan, Keah Choon (2001), "A framework of supply chain management literature," European Journal of Purchasing and Supply Management, 7 (1), 39-48.

---- (2002), "Supply chain management: Practices, concerns, and performance issues," Journal of Supply Chain Management, 38 (1), 42-53.

Tan, Keah Choon, Steven B. Lyman and Joel D. Wisner (2002), "Supply chain management: a strategic perspective," International Journal of Operations & Production Management, 22 (6), 614-31.

Taylor, Charles (1993), "To follow a rule..." in *Bourdieu: Critical perspectives*, Craig Calhoun and Edward LiPuma and Moishe Postone, eds. Cambridge: Polity Press.

Thompson, James D. (1967), Organizations in action: social science bases of administrative theory. New York: Mc Graw-Hill.

Tsoukas, Haridimos and Robert Chia (2002), "On organizational becoming: Rethinking organisational change," Organization Science, 13 (5), 567-82.

Walsham, Geoff (2002), "Cross-cultural software production and use: A structurational analysis," MIS Quarterly, 26 (4), 359-80.

van Donk, Dirk Pieter and Taco van der Vaart (2004), "Business conditions, shared resources and integrative practices in the supply chain," Journal of Purchasing and Supply Management, 10 (3), 107-16.

van Hoek, Remko I. (1998), "Reconfiguring the supply chain to implement postponed manufacturing," International Journal of Logistics Management, 9 (1), 95-110.

Van Maanen, John (1979a), "The fact of fiction in organizational ethnography," Administrative Science Quarterly, 24 (4), 539-50.

---- (1995), "Style as theory," Organization Science, 6 (1), 133-43.

Van Maanen, John (1979b), "Reclaiming qualitative methods for organizational research: A preface," Administrative Science Quarterly, 24 (4), 520-26.

Webster, Frederick E., Jr. (1994), Market-driven management: Using the new marketing concept to create a customer-oriented company New York John Wiley & Sons.

Weick, Karl E. (1989), "Theory construction as disciplined imagination," Academy of Management Review, 14 (4), 516-31.

---- (1995a), Sensemaking in organizations. Thousand Oaks, CA: Sage.

---- (1995b), "What theory is not, theorizing is," Administrative Science Quarterly, 40 (3), 385-90.

---- (1995c), "What Theory is Not, Theorizing Is," Administrative Science Quaterly, 40 (3), 385-90.

Weimarck, Mikael (2000), "In search of strategic consistency: A model for evaluation of how strategies support objectives," Doctoral Dissertation, Chalmers University of Technology.

Wenneberg, Sören Barlebo (2000), Socialkonstruktivism - positioner, problem och perspektiv. Helsinborg: Liber.

Whittington, Richard (2001), What is strategy - and does it matter? London: Thomson.

---- (2003), "The work of strategizing and organizing: for a practice perspective," Strategic Organization, 1 (1), 117-25.

---- (2006), "Completing the practice turn in strategy research," Organization Studies, 27 (5), 613-34.

Whittington, Richard and Leif Melin (2003), "The challenge of organizing/strategizing," in *Innovative forms of organizing: International perspectives*, Andrew M. Pettigrew and Richard Whittington and Leif Melin and Carlos Sánchez-Runde and Franz A. J. van den Bosch and Winfried Ruigrok and Tsuyoshi Numagami, eds. London: Sage.

Wilkinson, Ian and Louise Young (2002), "On cooperating: firms, relations and networks," Journal of Business Research, 55 (2), 123-32.

Williander, Mats (2006), "On green innovation inertia: An insider researcher perspective on the automotive industry," Doctoral Dissertation, Chalmers University of Technology.

Williander, Mats and Alexander Styhre (2006), "Going green from the inside: Insider action research at the Volvo Car Corporation " Systemic Practice and Action Research, 19 (3), 239-52.

Womack, James P. and Daniel T. Jones (2003), Lean thinking: Banish waste and create wealth in your corporation. London Free Press Business.

Womack, James P., Daniel T. Jones and Daniel Roos (1990), The machine that changed the world. New York: Rawson Associates.

Yusuf, Y. Y., M. Sarhadi and A. Gunasekaran (1999), "Agile manufacturing: The drivers, concepts and attributes," International Journal of Production Economics, 62 (1/2), 33-43.

Yusuf, Y.Y., A. Gunasekaran, E.O. Adeleye and K. Sivayoganathan (2004), "Agile supply chain capabilities: Determinants of competitive objectives," European Journal of Operational Research, 159 (2), 379-92.

Appendix 1

A narrative is both an anecdotal and a sensible construction that is made for a reason, in this case for understanding the development of Volvo's BTO strategy. It is founded in accounts that were communicated with a specific meaning and I convey them with a specific meaning. In my field study, questions aroused based on the material, which were explored by more interviews and by further questions to others' field work in combination with a theoretical interest with basis in SCM and integration. Interviews and project meetings were I have participated diverges from secondary sources in that they are experienced in face-to-face meetings. The different sources play different roles, not because they are primary and secondary sources, but because they all give meaning to the development. This relates to the kind of questions I confront the empirical material with, which are specific in this narrative writing. In the below table, my ambition is to make explicit the basis for the narrative in terms of source and questions posed to the specific material. Questions in interviews were always sent in advance, however, but seldom had we stuck to those questions. The initial questions in the interview protocol asked about the respondents' background and present role, to be followed by challenges and opportunities experienced. I recall especially one interview were the respondent had read the questions in advance, and when we came to the part of experienced problems and challenges most of the other questions were interwoven in the story. When it was time to write up the narrative I found that one to be a fantastic story, because I then had learnt about the development also from other sources.

Source description	Main question posed to material to get meaning	Reference
Nils Kinch, Uppsala University bases his interpretation on sources as a sales handbook from 1936, a lecture by Gabrielsson for Stockholm School of Economics, published in Volvo's customer magazine Ratten 1937, and Gabrielssons account for Volvo's development during his time as a CEO published in Transbladet 1956 but also Luftrenaren, a company magazine of AB Olofström	Producing the Volvo way: • What background has Volvo? • What heritage to the ways things are done as they are done?	(Kinch 1993) (Kinch 1991)
Volvo Cars homepage		Volvo Cars heritage at http://www.volvocars.com/

Appendix I

Source description	Main question posed to material to get meaning	Reference
Volvo Cars external material	Producing the Volvo way: • Persistence in how things are done	Sustainability report 2008/09
Volvo Life, Volvos customer magazine (changed name from Ratten 2006)	Producing the Volvo way: • How was the DRIVe concept created and launched as a quick response to critics?	Volvo Life, no 1-2008, Volvo PV
Results from Fenix-program, an executive PhD program with VCC managers	Major issues related to strategic development from late 1990s until early 2000s: • What issues are seen as critical? • How are they dealt with? • What impact on strategic development? • How do they relate to BTO and logistics?	Dissertations and related articles (Dahlsten 2004) (Ebrahimpur 2002) (Mikaelsson 2004) (Dahlsten, Styhre and Williander 2005) (Kohn Rådberg 2005) (Williander 2006) (Setterberg 2008)
Other theses: more specifically on logistics issues of VCC's sequential, modularized flows, and on strategic development		(Fredriksson 2002) (Persson 2004) (Weimarck 2000)
Research regarding Ford's acquisition	Major issues related to strategic development from late 1990s until mid 2000s: • Ambitions and consequences • Changes of the R&D integration process after the acquisition • What was Ford's impact on strategic development?	(Lundbäck 2002) (Lundbäck 2004) (Johansson and Lundmark 2006) (Bohlin and Hedbäck 2002)
Top management statements regarding the acquisition in media (in print and audiovisual)		Affärsvärlden, 080617 NyTeknik, 990414 Reuters TT, 980226 Aftonbladet, 990128
Results from a HSFR-report (Humanistisk-samhällsvetenskapliga forskningsrådet) in addition, transcripts, internal company presentations, company magazine related to the study	Major issues related to strategic development of customer ordered production: • Changes in relationships with reference to logistical systems • Perceptions of the change	(Hertz, Johansson and Jager 2001) (Hertz 1999)
Case study of dynamics in VCC's business orientation		(Liu et al. 2004)

Source description	Main question posed to material to get meaning	Reference
Surveys of car customers: Sales satisfaction index study based on more than 35,000 US new-vehicle buyers in 2005, 200, 2007, 2008. The 2008 escaped shopper study of almost 30, 000 US new-vehicle buyers. The customer report – the car market from a customer point of view based on more than 3,000 German customers in 2007, and the German automotive shopper study of more than 1,500 new-vehicle buyers in 2008.	Strategic development related to customer perception: • Customer perception with the new-vehicle sales process • Dealer and car customer interaction	J.D. Power 2005-2008 available through www.J.D.Powers.com J.D. Power 1996 in article (Bucklin, DeFalco, DeVincentis and III 1996)
Research of economic history, newspapers and meetings with employees, sustainability reports	Top management Financial performance (observe that VCC were after 1999 a part of Ford's results that to some extent were made available through articles and in the late 2000s officially by VCC)	(Broberg 2006) Newspaper articles through Google search: Each CEO's name and Volvo PV and rörelseresultat Interviews Serie of Sustainability reports
Industry journal (key words in search: "built to order" and "order to delivery"), doctoral dissertation and annual reports	Built to order for other automakers	Automotive news, (Jensen 2009)

Interviews and meetings. Results from Fenix-program, an executive PhD program with VCC managers.	Performative development and outcomes: • Perceived and experienced outcomes • Explanations of experienced dynamics and complexity	Supply chain monitoring project interviews: Audi 20041018, Faurecia, 041124, Novem 041208, Renault 041027, Treves 041209, BMW, (mail) Meeting with VCC-suppliers, VCC material planners 050309 Meeting with system-suppliers 050331 Interviews system suppliers 041111, 041112 Meeting with extended project group 051124 Meeting project group 040824, 040916, 041021, 041105, 041203, 050120, 050304, 050329, 050405, 050505, 050617, 050826, 050923, 051012, 051026, 051105, 051108, 051115, 051117, 051124, 051221, 060116, 060119, 060203, 060206, 060210, 060216, 060227, 060323. Further inquiry of development by interviews 070131, 070529, 070530, 070530, 070902, 070902, 070903, 071106, 071106, 081029, 081103, 081103, 081120, 090113, 090122, 090224, 090424, 090429, 090429, Seminar 051123 Workshop 041007 Especially regarding the new product development phase and the interaction between customers and product development (Setterberg 2008)

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