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# Product Identity and Coordination – A Case Study of Order Handling in an Organisational Network

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## Abstract

Many firms today are working together more intensively in order to gain relative competitive advantage. The wood industry is no exception. When firms work together more tightly, relationships are crucial to study. A relationship contains many aspects; e.g. different actors sense-making of processes and product identity, mutual coordination, and communication. Product identity for example relates to the perceived quality of the product. The norms that are connected to the product, as an artefact, control the way different activities are performed in the organisation. Organisational coordination is e.g. related to the "fit" between prerequisites, action/performance, goals when accepting orders, producing and delivering goods to customers. The main purpose of this work in progress paper is to describe and analyse product identity and coordination in firms working together in an organisational business network in the wood industry. The point of departure for our multiple qualitative case study is order handling actions in the studied firms. In this paper, we will present some preliminary results from our research and development project.

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# 1 Introduction

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This section is an introduction to the research project and the empirical context of this paper. This empirical context has been described in earlier works from this research project. Parts of the description of firms are based on Axelsson et al. (1999). Besides the background and description of the empirical context, the research questions, the purpose and scientific method are also presented in this section.

## 1.1 Background

Under the late 20<sup>th</sup> century, the market for the products from the wood industry did undergo a considerable change. Wood products had to deal with higher requirements, regarding price as well as quality. Competition between sawmills and other wood-manufacturing firms is hard nowadays. Substitute materials are also continuously gaining market shares, making competition on the remaining market for wood products even harder. Sawmills have many different products to offer in relation to the total demand. This leads to low prices and an average unsatisfactory profit. The building slump in the early 1990ies has affected carpentry and house-manufacturing firms. It caused recession and restructuring of industry in the single-family housing sector. During the latter part of the 1990ies, this sector generally recovered and several firms are now expanding.

### The Research and Development Project “SAIT”

The empirical material in this paper was generated from a research and development project named the “SAIT-project” (Co-operation and Business Development in the Wood-Industry).

The research and development project can be seen from an industrial as well as a research perspective (Axelsson et al., 1999). The industrial perspective means that the research aims are e.g. to increase competitiveness for individual firms as well as the whole wood value chain by inter-organisational development of business conditions and relationships. Furthermore the project aims to improve the preconditions for business and product development through inter-organisational co-operation and to improve planning, management and following up of material and information exchange in the wood value chain. To give good examples of inter-organisational projects for change and co-operation solutions is another important aim.

The project’s aims from a research perspective can be summarised as increased knowledge of inter-organisational learning and change processes and increased knowledge of inter-organisational co-operation (exchange of experience, business communication, coordination, materials refinement, transport, information systems) on both dyad and network level.

Increased knowledge of the connection between inter-organisational co-operation and internal business processes and work organisation together with methods and ways of working towards inter-organisational development (integrated business, information systems and competence development) as well as experience based knowledge on the use of these methods and working practises are very important.

The research and development project also represents co-operation on several levels between 1) different firms, 2) researchers from different subject areas (business administration/marketing, industrial economics and management, and informatics) as well as universities<sup>2</sup> and a research institute<sup>3</sup>, 3) researchers and firms.

## The Organisational Network and its Actors

Up to this date (in May 2000), we have studied six firms that are situated in a business network, so-called, wood chain. The chain begins in the forest and ends with the end consumer of small, exclusive, houses mainly made out of wood if we use the chain metaphor. All the firms can also be viewed as part of an organisational network (see Figure 1).

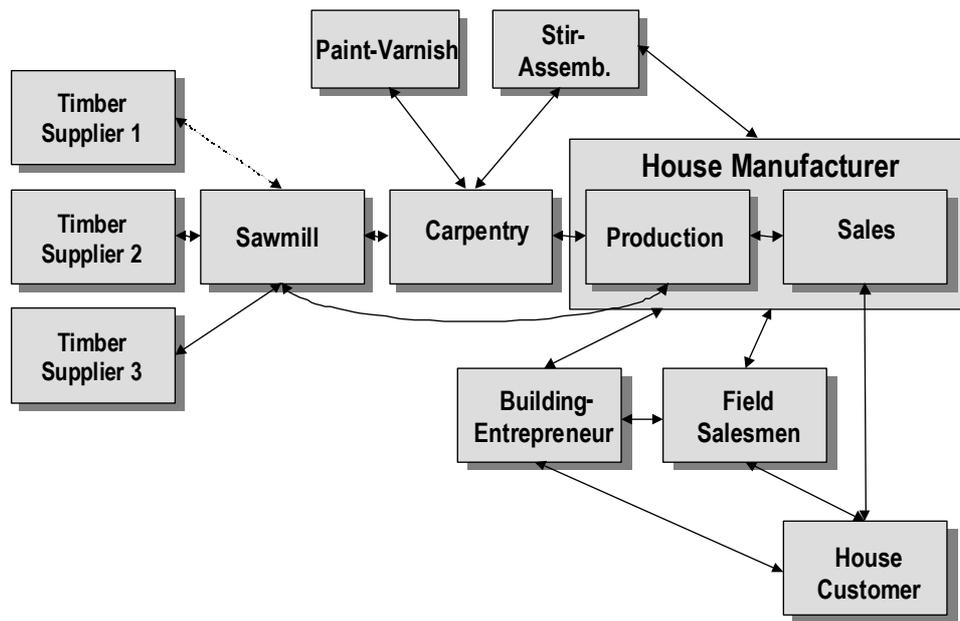


Figure 1. The Studied Organisational Business Network

To the extent they have been studied, focus has this far been on the private forest owners and their relation to the sawmill.

The studied sawmill is a family-owned company, established in the early 1900s. The majority of the raw material comes from big purchasing organisations and private forest owners. The business employs more than 30 people.

The sawmill exists in a volatile and competitive market, where raw materials are scarce and prices increasing. Securing the supply of raw material or logs is in focus. In principle, the sawmill buys all raw material they can get their hands on, without any regard for quality of delivered logs.

At the same time the requirements on the lumber-market has changed from traditionally be low regarding specific quality of the sawn products to, over the years, becoming a market with rising demand on quality and lower prices. Because this sawmill is a

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relatively small actor, compared to bigger sawmills in the business, competing in terms of volume is not profitable. Instead they try to their customers' needs.

The carpentry firm manufactures a central component in the house-building process, the stair. The first product was manufactured already in the 1930ies and since then production has continued under various forms of organisation. After going into receivership in 1991, two of the previous owners bought back the stock and machines. Today over thirty people are employed and, five administrators including the two owners. Since a couple of years, the firm enjoys very good profitability. The carpentry firm's business aims have remained the same since the beginning. The firm manufactures their product piece by piece, each product being unique. They have a number of product components that can be combined in various ways and the products are manufactured from wood of the customer's choice.

The paint and varnish firm is located in the carpentry firms own premises. They almost exclusively work with the stairs of the carpentry firm. Almost all of the paint and varnish firm's administration (i.e. invoices and planning) is taken care of by the carpentry firm.

The stair-assembling firm is made up of the owner and his eight employees. Their connection to the carpentry firm is that they assemble their stairs on the building site. Occasionally the personnel of the stair-assembling firm assemble stairs, before they are shipped out. When there are consumer complaints regarding the carpentry firms stairs, the stair-assembling firm is sent out to attend to the problem.

The stair-assembling firm also takes on assignments from different house-manufacturers and other carpentries with other products concerning consumer complaints. In these cases the carpentry firm administrates the stair-assembling firm's invoices and planning of travel routs between building sites.

The house-manufactory firm established in 1962. This is a high level export company, and Germany is an important market. The company manufactures approx. 200 houses per year. The head office is located in southern Sweden and the firm has around 65 employees. The company is since 1999 in a very rapidly growing phase. The firm's aim is to offer customised wooden houses, of a high quality and with an environmentally friendly appearance.

The building entrepreneur studied so far in is one of several building entrepreneurs locally engaged (in Sweden) by the house-manufacturing firm. There is a standing agreement between building entrepreneur and house-manufacturing firm for the entrepreneur only to build constructions prefabricated by the house-manufacturing firm.

The house sales office is working in close co-operation with both the building entrepreneur and the house-manufacturing firm. From time to time, this particular entrepreneur, described above, also functions as the local salesperson. Regularly a local sales office, working on commission, is engaged (in Sweden) by the house-manufacturing firm.

## 1.2 Research Question and Purpose

In the context of what has been presented above, several research questions can be put. Here we chose to deal with only a few.

The core issue in the research project is the relationships between actors in the studied organisational network. Communication and business acts are in focus. In this paper, we have chosen to take a closer look at the involved actors' sense-making of business and production processes in connection with their communication and mutual coordination. To grasp the sense-making of the individual actors we look at how they relate to their products and to their production process. With this as a springboard, we study the business process, narrowing it down to order handling in each of the studied firms.

In this paper we claim that contextual aspects like product identities and production processes, have a big influence on coordination of activities both within and between firms. The question we would like to look into in this paper is in which way contextual aspects influence coordination and business actions in the studied organisational network.

### 1.3 Research Methods

The method used in the SAIT-project can be characterised overall as a multiple, qualitative case study (see e.g. Stake, 1995; Yin, 1994) where every actor or organisation is studied as a case and then analysed on the organisational network levels. The work with the involved actors or organisations is done at three levels:

- At the *firm* level (the focus is intra-organisational)
- At the *network, dyad/relational* level (the focus is on co-operation between pairs of customers and suppliers)
- At the *extended network* level (the focus is on how actors act and relate to other actors in the studied network)

The research and development project is carried out by way of several interactive activities. Of great importance to the work is to incorporate into the study a number of small development projects within the firms in the network. Because of these development projects our study could be characterised as action research (e.g. according to Argyris et al., 1985) with interventions and co-operative actions.

The use of several techniques in order to gather empirical data is typical for qualitative case studies according to Denzin and Lincoln (1994). The empirical data consist of the result from interviews and discussions with personnel from the companies in the studied network and notes/graphs from business process mapping seminars. We also use documents (e.g. firms' business strategies), "on the spot-observations" and studies of artefacts (e.g. products, production layouts, logistic and information systems) as empirical means for "rich" data collection. We can here say that we let us be inspired by Latour's two rules of method, the first one that requires technology (artefacts) in action to be studied and the second that asks us to study the transformation of statements about technology (artefacts) undergoes in the hands of others (Latour, 1988). It is therefore important to pay attention to the language used by different actors. The language is both the maker of reality and meaning and a tool for understanding meaning and reality (Czarniawska-Joerges, 1993).

### 1.4 The Outline of This Paper

The outline of this paper is divided into five sections. As can be seen the introduction the background of the research project is given, the research question and the purpose of

the paper is followed by a short presentation of methods used in the research project. In the second section, we will describe our views on the theoretical landscape in which we operate. We also give some descriptions of the theoretical samples we use to view our empirical findings. In the third section, we describe the way actors in the organisational network deals with customers' orders and how different actors manage their order handling. We specifically discuss coordination, the role of products and the way they create "meaning" to the activities carried out by different actors. In the fourth section, we reflect on the relation between products as artefacts and the role these artefacts play in coordinating activities of actors in the organisational network we are studying. In the last section, we will look ahead and give some thoughts to and reflections on further research.

## 2 Theoretical Approach

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In this section we describe our view on the theoretical landscape in which we operate. We also give some descriptions of the theoretical samples we use to view our empirical findings.

### 2.1 Organisational Theories

Before we give our view on different types of network theory used in this paper, we would like to give some samples of organisational theory picked up from different sources that also inspired us.

#### 2.1.1 Organisations as Social Construction

The field of organisational studies is a wide eclectic field containing models from as disparate areas as economic, computer- and information science and sociology. There have been many sources of theory (i.e. economics, computer- and information science, political science) applied to the study of intra- and inter-organisational relations and actors. Although we feel that these disciplines have contributed to some extent to the understanding of organisations, there are still blind spots that need to be considered.

For a deeper understanding and interpretation of the reality of organisational action we borrow ideas from sociology and take the standpoint that the reality of organisations is a social construction.

In short<sup>4</sup>, this perspective is built on the point of view that individual actors in different situations construct their own reality and give it meaning by interaction with other actors and the perceived environment. In this way a certain degree of shared meaning is created in the organisation. This shared meaning is based on the rationality, which controls collective action. There is no need though for the actors in an organisation to share all meaning in a situation to perform. “Collective action is possible even in the presence of many meanings which are only partly shared. It is the experience of a given collective action which is shared, rather than its meaning” (Czarniawska-Joerges, 1993).

#### The role of Linguistic and Material Artefacts<sup>5</sup>

In organisational research, influences from socio-linguistics have gained an increasing importance. The study of labels, metaphors and platitudes as linguistic artefacts is central to this approach (Czarniawska-Joerges, 1993). “Labels tell us *what* things are”, “Metaphors say *how* things are” and “Platitudes establish what is *normal*” (Czarniawska-Joerges, 1993, p. 18). These linguistic artefacts are created through social interaction in the form of organisational talk, constituting organisational action. This organisational talk or “small talk” in the organisation about actions are the foundation for creating norms and ideals and make them circulate in and between organisations (Gustafsson, 1994). Gustafsson (1994) talk about memetic (*memetic exchange*) as a cultural mechanism to exchange norms and ideals (goals). The linguistic artefacts make

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<sup>4</sup> For a richer presentation on the ideas of social construction and the sociology of knowledge, we refer to Berger and Luckmann (1966).

<sup>5</sup> For a deeper discussion about artefacts, we refer to Latour (1998).

up symbols, which are used to produce organisational control and manage meaning by explanation.

Traditionally organisations are looked at as being composed of a production system and a control system. These systems are often loosely coupled according to Weick (1979). The control systems are conventionally seen as related to symbols created from linguistic artefacts while production systems are seen as related to the use of material artefacts (Czarniawska-Joerges, 1993). In the present study, material artefacts can be made up to be i.e. products, production layouts as well as logistic- and information systems. Material artefacts however also have symbolic value that can be used for the purpose of control. To the material artefacts actors can associate norms, which influence collective actions (Czarniawska-Joerges, 1993). The phenomena concerning material artefacts can be explained as a two-folded movement of people gathering around material artefacts and material artefacts forcing people to give their consent to certain activities or a certain way of action (Latour, 1998).

The interaction between actors is, to sum up, an ongoing process producing control and meaning. "Organizations are thus enacted and socially constructed daily, since any collective action requires a shared element of meaning. Meaning is thus created (both in social interactions and in interactions with artefacts and nature), de-constructed, negotiated and elaborated" (Czarniawska-Joerges, 1993, p. 124).

### The Concept of Coordination in Organisational Theory

Coordination can be seen as the action: "Bring different elements of a complex activity or organisation into a harmonious or efficient relationship" and to "Negotiate with others in order to work together efficiently" (Oxford Concise Dictionary, 1999).

The study of coordination can, from a research perspective be classified as interdisciplinary (Malone and Crowston, 1994), and is studied in at least the following subject areas; economics, organisational theory, linguistics, psychology, computer- and information science (ibid.). To reduce uncertainty is one important aspect of coordination. Coordination is also an action that is performed by an actor in order to influence or control other actions. Coordination actions and other actions are mutually dependent, and one important part of coordination is to handle these dependencies (Malone and Crowston, 1994, p. 90). Several definitions of coordination (e.g. according to Schiefloe and Syvertsen, 1993; Weiseth, 1993) also contain key words and phrases such as; the acts of dividing goals into tasks, the allocation of resources to completion of actions, and the migration of different actions into a whole, and evaluation of actions compared to goals.

Mechanisms for coordination are also discussed by March and Simon (1958) and Mintzberg (1983, 1988). The first two researchers identify three activities that are necessary in order to perform coordination; coordination through standardisation, coordination through planning, and coordination through feedback. The latter researcher also identifies a set of coordination mechanisms, partly based on March and Simons (1958); mutual adjustment, direct supervision, standardisation of skills, work processes, results and norms (Mintzberg, 1988).

Our point of view is that we can use coordination theory to understand and develop the work of different actors (related to us of material artefacts or not) and their relation to each other, intra- and inter-organisational, actors.

## 2.2 Network Perspective

In the following, we describe some theoretical samples, concerning network theory or perspectives we used to view our empirical findings. We are here inspired by such disparate disciplines as sociology, entrepreneurial research and marketing. With this eclectic point of departure, we continue our journey through the theoretical landscape.

### 2.2.1 Organisations as Nets of Collective Action

To make the transition from organisation theory into a perspective of networks (of many organisations or actors), we use the idea that an organisation can be seen as a net of collective action (Czarniawska-Joerges, 1993). These collective actions shape and organise the lives of the human actors involved in the organisation.

With this as background, it is important how to view different types of actors (i.e. actors on the micro- or macro level). Is there any distinction between them? According to Latour (1998), it is beside the point to make distinction between micro-actors (human individuals) and macro-actors (institutions or organisations). There is of course micro-actors and macro-actors, but the difference between them by the distribution of power and network constructs will *escape analysis* if we *a priori* assume that macro-actors are bigger than or superior to micro-actors. (Latour, 1998). The size of the actor is determined from a long power struggle and likeness in form and structure does not mean that actors necessarily have the same size. According to Latour, the best way to understand this phenomenon is to view actors *as* networks.

### 2.2.2 Imaginary Organisations as a Perspective

Hedberg and Olve (1997) discuss the term "imaginary organisations" as a term that stands for an observer's (or organiser's) view of a virtual organisation. A virtual organisation lacks some structural characteristics of real enterprises, but has functions like an enterprise in the imagination of an observer. Hedberg and Olve (1997, p. 2) also present a definition of imaginary organisations:

"Imaginary organizations are organizations where important processes, actors and resources appears both inside and outside the legal unit of enterprise, both outside and inside of the accounting system and of the organization charts. Market and hierarchies are interconnected through networks of cooperating people and coordinating information technology."

Imaginary organisations are held together by five major activities; the pooling of financial resources, sharing of infrastructures, pooling of competence, mutual trust, and building of relationships, trust and identity (Hedberg and Olve, 1997).

### 2.2.3 Business Network Perspective

Within the particular field of marketing which is known as the business networks perspective (e.g. Axelsson, 1996; Hammarkvist et al., 1982; Håkansson, 1987; 1989) many aspects which are relevant in this paper regarding businesses and their relationships can be found. An important starting point for networking is that an individual firm enjoys meaningful relations with other organisations, which can be with customers or suppliers or even organisations producing complementary and/or rival products. Relationships have also been studied within what is known as relationship

marketing (e.g. Gummesson, 1995). An organisation can be said to belong to one or several networks of organisations and a particular network can in its turn be related to other networks, for example, an industry wide network (Hammarkvist et al., 1982). The individual organisation's resources must complement those of others in the network to be competitive. This interplay between internal characteristics and external relationships should therefore be studied at a time of change (ibid.). An example of that interplay can be found in order handling.

The various links, bonds and ties between organisations in a network are important to consider when studying relationships in business networks (e.g. according to Håkansson and Snehota, 1995; Axelsson and Easton, 1992)<sup>6</sup>.

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<sup>6</sup> For further discussion on relationships in business networks, see Håkansson and Snehota (1995).

## 3 Order Handling by Different Actors

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In this section, we describe the actors in the organisational network and the way different actors manage their order handling. We specifically discuss the coordination between order handling and other activities, as well as the role of product identity and the way it creates “meaning” to the activities carried out by different actors.

Our view of order handling is very broad. By order handling, we mean every activity performed inside a firm and between a firm that has a direct relation to a customer order. This point of view can be compared with Goldkuhls (1998) broad view of business processes divided into six generic phases: business prerequisites phase, exposure and contact search phase, contact establishment and negotiation phase, contractual phase, fulfilment phase, and completion phase.

At the centre of our attention the sawmill, the carpentry firm and the house-manufacturing firm (our core firms). One reason for this is that they best represent the three different mind sets existing from the forest to the end consumer – three different clusters of meaning, or cultures. They are represented by the sawmill, the carpentry firm and the house-manufacturing firm. Below we give some characteristics to build our discussion on.

### 3.1 The sawmill in the Organisational network

In principle, the sawmill buys all raw material it can get its hands on from different suppliers, without any great regard for quality of delivered logs. The inner quality of the logs is not known when they are delivered to the sawmill, which makes it hard to estimate the quality on the sawn lumber. At the same time, the sawmill customers want lumber with specific quality. In spite of this, the reasoning in the sawmill firm is influenced by the view that getting a certain volume raw material, cutting it into lumber and counting on finding an outlet for the sawn products is an accessible way of working.

The sawmill is not directly used to actively seeking new customers and does not have any experience in advertising outside the boundaries of their existing customer relations. They receive orders for lumber to be produced rather than sell their products to the customer.

The acceptance of orders (initial phase of order handling) by the sawmill is dependent on very few persons. The managing director, also acting as salesman, and the production manager in this small firm, deal with this issue in an informal way, and the negotiating concept in coordination theory is rather uncomplicated between these two actors and can be related to the term “mutual adjustment” by Mintzberg (1988). This informal way of adjustment can be said to be largely executed by “small talk”, the concept described by Gustafsson (1994).

One explanation of the informal and rather uncomplicated way of dealing with order acceptance issues is that the managing director and the production manager has got a very good picture of the whole business and productions processes and do not have to involve other actors in the firm to coordinate questions concerning production resources, times of delivery etc.

The products are labelled or defined according to dimension and, to a certain extent, to their sorting quality. There is no emphasis put on the lumber's final use. That is, there is very little negotiation involved regarding specific quality based on the use of the product.

One interesting division of labour, as an important aspect of coordination, between the sawmill and its customer that we have found, is that the performance of confirmation activities depends on the type of customer. Customers can be divided into two main categories, direct customers and agents. If the customer is a direct customer, the sawmill (the supplier) confirms the order and on the other hand, if the customer is an agent, the agent confirms the order.

If we look at different actions associated with these two types of customers, the most striking explanation relates to the way these two types of customer regard the products they buy. The direct customer often has a strong understanding of use of the purchased product. This makes it easier to perform collective actions (Czarniawska-Joerges, 1993). The agent has a limited understanding and interest of the practical function of the products they buy. The values of the products are not related to their function and practical use in the same way as were the case with the direct customer.

From a business network perspective, this division of labour conducted by the sawmills and the relation with the customer can be seen as an important factor deciding what has to be done inside the own firm and what can be done by other actors.

As could have been seen earlier in this paper, there is a paradoxical relation between the sawmill activities on raw material market and their customer market. To cope with the shifting requirements on these two markets mentioned, the sawmill is mainly practising warehouse production. There is also a strong focus on production capacity and yield of lumber out of the logs. Although there is a lot of discussion about introducing new, value adding activities into the production layout, the sawmill still see and handle their products (and orders) as bulk without any big significant value.

The production system, as an artefact has a strong influence on how people in the sawmill perceive their assignments. The norm connected to production system, claims the value of maximising the use of production capacity in favour of customised products (i.e. function to the customer).

## 3.2 The Carpentry Firm in the Organisational Network

The carpentry firm has the greater part of the stock reserved for them in a warehouse owned by the sawmill. The procured lumber products are seen as components to be cut out to fill certain functions. To put it in another way, they regard raw material and finished products as components to be assembled and placed in the house under construction in some way. The products are identified after the functions they are meant to fulfil. This is reflected in the production layout where the stair-spindles are produced separately from the rest of the stair-components.

The carpentry firm plays an important role as a demanding direct customer to the sawmill. The carpentry firm orders material with a high degree of refinement and has special quality demands. These two issues influence the sawmills actions, level of refinement and product mix and can be classified as a inter-organisational kind of coordination.

Like the sawmill, the carpentry firm does not actively seek new customers. They rely for the most part on old connections and their good name in the business community. In their negotiation with customers, specific requirements on the staircase are focused. The variations in the stair-specification are big.

In the carpentry firm, the initial phases of order handling is done by one of the three salesmen. They use a common “order- and production planning matrix”, put on a whiteboard, to coordinate their different orders with the production capacity. This firm has a maximum number of products that can be produced in one week that is displayed in the matrix. These maximum numbers of units are known by every salesman and have to be negotiated if a change is motivated. If the product sold has some kind of “unusual” characteristics according to the carpentry salesmen (e.g. built of a particular sort of wood or other material), the person handling purchasing has to be informed to make sure that the right kind of material is ordered and delivered in time for production. In this case, as well as in the sawmill case, the dialogue between the different actors is informal, motivated by demand, and often takes place in the “corridor” (mutual adjustment by small talk, combining Mintzberg (1988) and Gustafsson (1994)). In this case study, we can identify that the type of product and its characteristics has an impact on what actions that are performed, coordinated and dialogues that are initiated.

In the carpentry firm, the focus is on production. Contrary to the sawmill, the carpentry firm sees production as a more mechanised form of craftsmanship, not mass production. This way of construction of meaning has greatly influenced their actions towards that of the other firms in the studied network. In order to maintain their identity as a firm working under craftsmanlike circumstances, they have outsourced many activities to underentrepreneurs. For example a paint and varnish firm located in the carpentry firm’s own premises and a stair assembling firm that occasionally lets its personnel assemble stairs before they are shipped out.

Although the carpentry firm views its raw material and products as components which have been given a functional meaning, the assembled staircase is not to any great extent related to the rest of the modules in the house. How the stairs will fit, together with the rest of the house is given limited thought. The carpentry firm is trying to remedy this by using the stair-assembling firm as a link to the building site. On the occasions when the assembling service is included in the carpentry firm’s product, the stair-assembling firm brings the unassembled staircase to the building site. An assembled staircase well fitted to the rest of the house has undergone a metamorphosis, now seen as piece of furnisher. It is one of the important points in evaluating the house as a product.

### 3.3 The House-manufacturing Firm in the Organisational Network

The house-manufacturing firm is a larger firm than the sawmill and the carpentry firm. It has a unique price for every product, a higher complexity and variation of products and a higher complexity in their relations with different other actors (e.g. agents and builders) in the organisational network.

The house-manufacturing firm is to a great extent focused on customer preference. Because of this, the construction/design department and the sales department are the firm’s core activities. Production is mainly concerned with fitting components and small modules together forming bigger prefabricated house modules or units. The situation of

the house-manufacturing firm is very complex. Due to the many different module-components and several different functions in the firm, the amount of shared meaning is limited, and the difference between salesmen, designers and operative personnel noticeable.

There is numerals of suppliers of different kind of components, modules and materials making deliveries to the house-manufacturing firm. Due to the great diversity of the parts of the house, there are many labels, description and uses for the same component, module or material. To bridge these gaps of understanding the house-designers function as a link between the sales department and the operative production-personnel. Their descriptions and definitions provide “the bricks” by which the shared meaning constituting the firms collective action is built (Czarniawska-Joerges, 1993).

Offering houses to potential customers (including construction, architecture and prices) is a complex activity involving the firm’s own salesmen, agents (if exported outside Sweden), actors from the sales service department, the administration and the construction/design department. The purchaser (in contact with the suppliers) can also be involved if customer demands are specific (differ from standard offer). If the offer becomes an order from a customer, it is brought up as one issue on the agenda of a production meeting. At the production meeting, status and different prioritised questions are dealt with. An “order file” (containing different blue prints, agreements, and economic information) are also put together in order to deal with documents in a structured, manual, way.

The sales department tries to reach customers in a more active way, contrary to the sawmill and the carpentry firm. In their contacts with the customers, they are very obliging to individual preference. The consequence is that there are never two houses that are defined the same. To put it in another way, the houses are individuals, artefacts created from norms and shared meaning by customer, seller and house-designer.

The house-manufacturing firm has, as can be understood from the above, a higher level of division of labour and more specialised roles than the other two firms do. The “talk” about production (lead times, status, priority etc.) is more systematic and regulated in meetings. A so-called “global planner” has got the overall responsibility and power to change status (and allocate resources [see e.g. (Weiseth, 1993)]) etc. of houses in production and delivery promises to customers which can be compared more with direct supervision and coordination through planning than the other two firm’s mutual adjustment (e.g. Mintzberg, 1988).

The house-manufacturing firm has, as stated in the introduction engaged several local building entrepreneurs (in Sweden). In their practical co-operation, the house designer and the entrepreneur plan the deliveries to the building site. The business transactions are dealt with through direct contacts with the managing director, production manager (responsible for deliveries and transportation) and administrative personnel at the house-manufacturing firm.

Not every part of the house is delivered via the house-manufacturing firm. Some parts are ordered by the designers from a couple of suppliers (i.e. the carpentry firm) that transport them directly to the building site. In this way, the parts are never physical objects, only symbols (linguistic artefacts) in the aid of the house-designer.

### 3.4 Logistic Coordination and Meaning

In the texts presented above, we have seen coordination and identity of artefacts, norms and values associated with products. We have tried to deal with aspects related to product identity and coordination that we see as relevant to the order handling activities.

The business process and order handling as such for the most part ends with some kind of delivery. These deliveries contain products (material artefacts), information and communication (linguistic artefacts). Altogether, this provides norms and meaning, with which logistic action, service and coordination are carried out. All this is in one way or another, formalised in the way orders are being registered and handled.

To give some examples of the different ways to handle products in relation to the understood meaning of the order prescription we will, in short, comment on the ways of making deliveries in the studied network.

Deliveries from the warehouse at the sawmill to the carpentry firm occur within a regular interval of one to two weeks. The definition of the lumber is scarce and is concerned with volume, some type of raw quality and sorting quality. The lumber is wrapped and strung to hold the packets together, without taking much consideration to the risk of damaging the products (compared with the products of the other firms). In the sawmill's relation with the carpentry firm, the sawmill holds stock on behalf of the carpentry firm. The products are still labelled by dimension and sorting quality, and there is no explicit reference to the use of the products. An effect that can be seen by this is the relatively long timespan between deliveries and the relatively weak connection between the deliveries and the production activities of the carpentry firm.

As mentioned before stairs from the carpentry firm rarely pass the house-manufacturing firm when delivered to the building sites. The information about the stair-delivery is supplied to the house-manufacturing firm and helps it to coordinate the delivery of other house parts or modules. When delivered to building site, the stairs are well wrapped and the content of the packing can only be "guessed". To some extent, this takes away the meaning from the stairs and hinder some action (e.g. the stair cannot be clearly identified until it has been unwrapped, to this can be added that the assembling instructions are sealed within the wrapping of the staircase) on the building site. An exception to this is when the stair-assembling firm assembles the stairs "on site". They bring the staircase and wrap them up as little and as carefully as possible. The staircase can then be assembled immediately on the building site. This latter case can be viewed as an example of inter-organisational coordination because the house-manufacturing firms' relation to the end customer (and the customer demand) influences who is going to assemble the staircase and when. It has also a coordinating effect on the packaging of the product at the carpentry firm and on their use of material.

## 4 Products as a Coordinating Factor

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In this section, we reflect on the relation between products as artefacts and the role these artefacts play in coordinating activities of actors in the organisational network we are studying.

### 4.1 Products and Coordination

In this paper named “product identity and coordination” we have tried to investigate how these two aspects could be used to gain a better understanding of the organisational network and of its individual actors.

The concept of “product identity” can have a different meaning to different people and in different fields of research. We can here take into account the perspective of social construction by looking at the following citation: “Every building is socially constructed: it consists of bricks, mortar, human labour, building law, architectural design, aesthetic expression and so on, all of which in turn are socially constructed concept of a building” (Czarniawska-Joerges, 1993, p. 124). This citation is taken from the a context when viewing organising and organisation. It can also be used in viewing the “end-product” produced in the studied organisational network. The finished houses are also social constructions, consisting of components and modules made out of different materials, human activity and design based on norms and aesthetic values.

By “product identity” we, in this paper, relate to norms and ideals connected trough shared meaning of material artefacts. Material artefacts always have a symbolic value, and to some extent exercise control of human action or activity (Czarniawska-Joerges, 1993).

To exercise control is also one of the cornerstones in literature concerning coordination. Coordination can be seen as the action bringing order to different elements of a complex activity or organisation. Coordination is performed by an actor in order to influence or control other actions (Malone and Crowston, 1994). March and Simon (1958) identifies standardisation, planning, and feedback as a necessity in order to perform coordination.

In our case studies, we have so far identified that inter-organisational coordination (through relations in the network) seems to be important in further studies. The theories that we have used (e.g. March and Simon 1958 and Mintzberg, 1983, 1988) seem to study coordination from a firm internal point of view. We have also found that material artefacts (e.g. stairs as products) and administrative personnel (at different hierarchical levels) seem to have a larger impact on people’s action than found in the literature presented and discussed above.

When looking at the organisational network three different clusters are possible to distinguish. Here, the sawmill, the carpentry firm and the house-manufacturing firm represent those three clusters. The whole presentation in this paper was built mainly around these three firms.

Structuring the organisational network into three different clusters makes it easier to grasp tensions in the combined structure. By introducing fixed boundaries in our analytical approach, through structuring, we will increase the turnout (Gustafsson,

1999). Viewing the three clusters from a combined perspective of coordination and the use of products as material artefacts there is several observations to be made.

One of the things observed is the shift between the clusters in the way products are perceived and valued (meaning). The fact that value adding activity, as such, change the products to appear as having a higher value then before, is not a revolutionary idea. In fact, without this shift and change there would not be anything called “value adding activities”. What is more important and interesting is the interplay and tension between the boundaries (Gustafsson, 1999) of the shifts of meaning and the change of product-appearance. The shifts of meaning create new kinds of collective action (e.g. new value adding activities) and these actions in turn have the ability to invoke new shifts of meaning.

Iteration between meaning, collective action and change of product-appearance is an ongoing organising process. This kind of process can be detected in many activities in the studied firms, such as e.g. planning and coordination (Mintzberg, 1983). We have identified that shifts of meaning and change of product-appearance are vital parts of this process.

For each cluster in the organisational network, there is also a specific amount of complexity. The complexity of the products in the sawmill<sup>7</sup> is small. The complexity is then increasing the closer you get to the “end-market” (customers buying houses).

There is an increasing need to control and coordinate activities. One of the ways this is done in the organisational network is by constructing meaning concerning the practical use of their raw materials and produced products (instructions, norms and rules). The symbolic value of the material artefact gets stronger. At the same time, the original qualities of the product is getting harder to distinguish. It is as if they get a new coating of norms and ideals on top of the old ones. This can be seen e.g. in the way products are wrapped up before delivery (a change of product-appearance). Latour (1988; 1998) talks of this in terms of black boxes. Gustafsson (1999) also talks about boxes within boxes. To coordinate complex situations, we therefore need to be more aware of how to use norms related to material artefacts (product identity) in the best way.

In some of the literature concerning coordination (e.g. Mintzberg, 1983, 1988) the coordinating role seems to be exclusive for managing directors and such. We claim that other actors, and not just managers, can perform acts that do not have an explicit function of being coordination, but has a coordinating effect on other people’s actions (within or outside a firm) in e.g. order handling.

Another observation in our empirical study is that coordination through feedback (March and Simon, 1958) and evaluation of actions compared to goals (Weiseth, 1993) seem to be areas that are weak in practice. This poorly developed feedback makes it harder for iteration of shifts of meaning, collective action and change in appearance to take place. The opportunity to assimilate second hand knowledge (generated from experience) though memetic exchange is not fully utilised (Gustafsson, 1994, 1999). These aspects, important both to memetic exchange and coordination, however, seem to be an important area for improvement in the firms studied.

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<sup>7</sup> Although the production complexity is claimed to be very high. This is due to the divergent material flow in the sawmill. We claim that an even more important source of uncertainty is the paradoxical relationship between the sawmill’s raw material market and their customer market (the lumber market).

Finally, the imaginary organisations perspective from (Hedberg and Olve, 1997) also seems to be promising in studying and understanding our business network. We have so far identified that one actor at the carpentry firm has an imagination of his firm that goes beyond the legal unit of the firm. This firm shares infrastructure with e.g. the stair-assembling firm and the paint and varnish firm. They also pool competence and have a mutual trust in their relations.

## 5 Further Research

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We will now look ahead at further research based on the discussion presented in this work in progress paper. The paper is one part of an ongoing research project that aims to increased knowledge of inter-organisational learning and change processes and increase the knowledge of inter-organisational co-operation (exchange of experience, business communication, coordination, materials refinement, transport, information systems).

In the present paper, we have emphasised the importance of the product's contextual and cultural role for coordination, planning and other actions in an organisational network. Of great interest is the iteration between meaning, collective action and change of product-appearance as an ongoing organising process. In the upcoming research, we will develop this aspect further.

Another important aspect is the three cluster-structure observed in the network. We would like to study the boundaries of these clusters and develop a further understanding of the cultural and conceptual tensions between them.

We also see the imaginary organisation perspective as promising to increase our understanding of the studied network.

Our intention is to extend the network with other actors, not yet studied in detail, combining the imaginary organisation perspective with the perspective of organisations as nets of collective action. The sawmill, the carpentry firm and the house-manufacturing firm are all surrounded by a lot of other firms (as in the case of the carpentry firm being surrounded by firms like the paint and varnish firm and stair-assembling firm). In this way, we will i.e. study the building (and logistic) process and network actors' involvement in the building process.

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