Images of a Wood Industrial Network
— A Multi-Perspective Approach

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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 are working together more tightly, relationships and interaction are urgent to study. In this paper we try to use several different or parallel perspectives in order to get a rich picture/image of an industrial network in the wood industry. The perspectives we use are the industrial/business network approach, the "Uppsala School", as well as the virtual organisations/imaginary systems metaphors and the methods and concepts from the information systems- and business development field. The main purpose of this paper is to describe images from, and analyse the studied wood industrial network with a combined network, imaginary organisations and business/information systems development approach. These images can help us, and hopefully the reader of this paper, to increase our ability to study and understand the empirical data in new or complementary ways.

Images of the wood industrial network from our combined use of perspectives/approaches show among other things that the studied wood industrial network is a complex pattern of, often, informal relationships based on social interaction and mutual trust. As a result of our study we also present different empirical findings explicitly related to the perspectives and an outline of a tentative multi-perspective approach.

1 Introduction

Many firms today are working together more intensively in order to gain relative competitive advantage. The wood industry is no exception. When firms are working together more tightly, relationships and interaction are urgent to study (e.g. Axelsson and Easton, 1992; Håkansson, 1982; Håkansson and Snehota, 1995).

Always when studying industrial networks and the organisations that are part of them, the person studying has a certain perspective, more implicit or explicit, and frame of reference. In this paper, and the R&D-project described below, we are trying to use several different or parallel perspectives in order to get a rich picture/image of an industrial network in the wood industry (called "Wood Industrial Network" below). The perspectives we use, and present in this paper, are the industrial/business network approach, the "Uppsala School" (e.g. Axelsson and Easton, 1992; Håkansson and Snehota, 1995), as well as the virtual organisations/imaginary systems metaphors (e.g. Hedberg et al., 1997; Hedberg and Olve, 1997) and the methods and concepts from the information systems- and business development field (from the method group SIMM, e.g. Goldkuhl, 1998; Goldkuhl and Röstlinger, 1984, 1988). When using this kind of perspectives our intention is also to combine the more understanding and analysing oriented business network and imaginary organisation approaches with the more analysing, improvement oriented and so far intra-organisational focused SIMM-methods. Hultgren (2000) has earlier done a parallel application of the network approach and methods and concepts from the information systems- and business development field.

This eclectic use of theories can of course be criticised as being too broad and "blurred" and not following the originator's intentions. However, we think that our eclectic approach is a usable way of, hopefully, consciously use concepts and categories from different literature and subject areas in order to guide and enrich our images of organisations and industrial networks.

As indicated above the work presented in this paper is based on a two-folded interest. From a research perspective the aim is to create more empirical knowledge about a wood industrial network, containing partnerships and a high level of "informal networking", in order to generate increased knowledge of e.g. inter-organisational co-operation (exchange of expertise, business communication, co-ordination, and the use of information technology). The second interest is action research oriented (Argyris et al, 1985) and can also be viewed from an industrial perspective. Two important aspects here are to increase the competitiveness of individual firms as well as the studied network by inter-organisational development of business conditions and relationships.

The empirical material in this paper is generated from an R&D-project named "SAIT-project"[1]. This project is a 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 and a research institute, 3) researchers and firms (Axelsson et al., 1999). Anonymous firms included in our study (see also Figure 1 and section 3.1 for further description) are; three Timber Suppliers, the Sawmill, the Carpentry Firm, the Paint- and Varnish Firm, the Stairs As-

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[1] SAIT is a Swedish acronym for "Samverkan och affärsutveckling i träkedjan", and is translated into English: Co-operation and Business Development in the Wood-Industry.

sembling Firm, the House Manufacturer, the Building Entrepreneur, and the Field salesmen. These firms all represent small- and medium sized firms, mainly located in the southern parts of Sweden. We have also studied two private Swedish house customers.

1.1   Research Question and Purpose

The main purpose of this paper is to describe images from, and analyse the studied wood industrial network with a combined industrial/business network, imaginary organisations, and information systems-/business development approach. Another purpose is to briefly reflect on our use of conceptual frameworks and perspectives and present an outline of a multi-perspective approach. These images (e.g. according to Morgan, 1986, 1993; Walsham, 1991) and reflections are an important input for our further R&D-work in the project described above. These images can help us, and hopefully the reader of this paper, to increase our ability to study and understand the empirical data in new or complementary ways (Morgan, 1993).

Questions we ask in this paper are what experiences can be drawn from using different perspectives when studying an industrial network? Is a combined approach like this generative in order to get a "rich picture" or image of the studied organisations and the organisational network? What can a tentative outline of a multi-perspective approach look like? Of course these questions can not be fully answered in a short paper like this; but it seems important from our point of view to be explorative and raise the questions, as well as to reflect on possible answers.

1.2   Research Approach

The point of departure for our multiple qualitative case study is empirical material based on interviews, working seminars (e.g. with business- and process modelling activities), studies of documents, and studies of people's use of artefacts, e.g. information technology. To describe and analyse our empirical data several theoretical perspectives or conceptual frameworks has been used as inspiration. The business network perspective from the "Uppsala School" (e.g. Axelsson and Easton, 1992; Håkansson and Snehota, 1995), as well as the virtual organisations/imaginary systems metaphors (e.g. Hedberg and Olve, 1997) are examples of conceptual frameworks that we have used together with methods and concepts from the systems- and business development field, e.g. a change analysis framework (e.g. Goldkuhl and Röstlinger, 1988). The two first conceptual frameworks will help us to describe, understand, and analyse e.g. structural (continuity, complexity, symmetry, and informality) and process characteristics (adaptations, co-operation and conflict, social interaction and routine nature) of business relationships (Håkansson and Snehota, 1995) and co-ordination as well as pooling of financial resources, sharing of infrastructure, mutual trust, and identity (Hedberg and Olve, 1997).

Methods and concepts from the information systems- and business development field (from the method group SIMM, e.g. Goldkuhl, 1998; Goldkuhl and Röstlinger, 1984, 1988), help us to describe, understand and analyse processes (e.g. "ways of doing business"/business actions, information- and material flows from an internal and relation-

ship perspective, and the use of computers and other important artefacts), their strengths, weaknesses/problems and needs for improvement in a structured way.

The business- and information systems development approach is the methodological "home ground" for several of us in the R&D-project. This can certainly be viewed as a bias in a study like this.

1.3   The Outline of this Paper

This paper is divided into four sections. After this introduction we will shortly present the selected perspectives on firms and organisational networks. The third section contains a presentation of the studied organisational network and our views of the network based on the use of the different perspectives. Finally the paper contains reflections and discussion of our experiences, together with some proposals for further research.

2   Perspectives on Firms and Organisational Networks

In this section we will summarise the different perspectives or conceptual frameworks that we have used in our study. The first two perspectives discussed below are in part also presented and discussed in Markgren and Melin (2000). The third perspective, the business- and information systems development approach is an introduction to the more normative and intra-organisational oriented approaches we use. However in these approach there are also a model for analysing dyads between firms; the Business Action Theory framework.

2.1   Business/Industrial Network Perspective

Within the field of marketing known as the business network perspective or industrial network approach (e.g. Axelsson, 1996; 1998; Hammarkvist et al., 1982; Håkansson, 1987; 1989; Hägg and Johanson, 1982) 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. Further more the network approach can be described as:

> It shares with other approaches a belief that the existence of relationships, many of them stable and durable, among firms engaged in economic exchange provides a compelling reason for using inter-organisational relationships as a research perspective (Easton, 1992, p. 3)

The scope of the approach is, according to Easton (1992), to support the understanding of the totality of relationships among firms engaged in production, distribution and the use of goods and services in an industrial system. The system boundary is concerned as problematic and will depend upon the purposes for which the boundary is being drawn. The focus of research is the network and not the individual firm or individual relation-

ship[2]. However firms and relationships must be studied if networks are to be understood according to Easton (1992).

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.).

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). As well as to describe, understand, and analyse e.g. structural and process characteristics of business relationships.

The network approach has a primary goal to describe and explain, not prescribe. The perspective has profound normative implications, but this is a result of the approach rather than the driving force behind it. (Easton, 1992). Håkansson and Snehota (1995, p. 3) formulates the basic research issue as:

> …how can the intercompany relationships be described, analysed and explained.

2.2   Imaginary Organisations as a Perspective

Hedberg et al. (1997) and Hedberg and Olve (1997) discuss the term "imaginary organisations" as a term that stands for an observer (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 organisations are organisations 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 organisation 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). The imaginary organisations perspective helps, according to Hedberg et al. (1994), one to e.g. discover the "invisible" resources, to make new structures explicit, to pay attention to core competence, and to develop a better understanding for intuitive business/transactions.

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[2] Relationships have also been studied within what is known as relationship marketing (e.g. Gummesson, 1995). Relationship marketing has partly other basic standpoints than the network approach. We will not deal with the similarities and differences in this paper.

There are differences between the Uppsala school and the imaginary organisation perspective, according to Hedberg et al (1997). One of these differences is concerned with the borderline between the company and its environment:

> But, unlike the Uppsala school, we do not find it natural to distinguish between the "company" ant its "environment". The imaginary organisations perspective which we have studied tend to regard the entire playing field as the "company" when building up new businesses, or to view virtually all parts of their current operation as a potential "environment". (Hedberg et al. 1997, p. 25)

Hedberg et al. (1994, 1997) also seems to put the "imaginator" or the "director" as a person or role more in focus. A common business concept for the whole (imaginary) system and an attractive culture is also pointed out as a difference to the network approach (Hedberg et al., 1994).

As we, and Hedberg et al. (1994), see it the business/industrial network perspective and the imaginary organisations perspective has several similarities (e.g. the network and relations as basic standpoints).

2.3 The Business- and Information Systems Development Approach

Business development and information systems development are two areas closely linked to each other. When developing information systems we also develop and change businesses. A common way to change organisations is to develop an information system and, thus, computerise some of the business actions. Business- and information systems development is a huge area covering many models, methods, and theories. We do not intend to explain the whole area in this paper, but we will mainly focus upon some methods, models, and theories that we have used empirically in our case study.

By business- and information systems development approach in this context and paper we mean a particular perspective on change activities where business actions and actors are focused, instead of only information technological issues. Systems development should therefore be seen in the wider perspective of an organisation. We will explain this approach below by discussing a method for change analysis and a framework for understanding and developing business actions in and between firms.

2.3.1 The Concept of, and Methods in SIMM

We have been working with a group of methods called SIMM during several years. The acronym SIMM stands for Situation adaptable work and Information systems Modelling Method. SIMM is developed by the research group VITS[3]. In this paper we delimit our discussion to one of the methods called change analysis (CA/SIMM), which is a structured method for early phases of business and information systems development (e.g.

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[3] VITS (deVelopment of Information systems and work contexTS) is a network based research group located at several Swedish universities (mainly in Informatics/Information Systems Development Departments). For more information see: URL: http://www.ida.liu.se/labs/vits.

Goldkuhl and Röstlinger, 1988). However, within SIMM there are several other methods, for example VIBA/SIMM (Versatile Information and Business Requirements Analysis), which is a method for specifying requirements on information systems and businesses to be developed. This implies that VIBA/SIMM can be used after a change analysis has been accomplished.

A change analysis is performed in order to analyse goals, problems, strengths, and business processes within one or several business contexts in order to formulate change requirements. The change requirements form the basis for specifying different measures. The purpose of conducting a change analysis is to generate well-grounded measures for developing businesses and organisations. The Change Analysis method (CA/SIMM) is used to support method users in the initial phases of business development. The formulated measures can concern aspects such as development of personnel, marketing, organisation structure, administrative workflow, and information systems (Lind and Seigerroth, 1997).

CA/SIMM includes method components (with different modelling techniques) for analysing goals, problems, strengths, and business processes. It has an emphasis on problem solving, critical evaluation, communicative interaction, and creative thinking. The analysis is accomplished in an iterative way.

Analysing Goals

The purpose of analysing business goals[4] according to CA/SIMM is to identify and define what goals that will be applied in the business context in the future. Analysing the goals will answer questions such as:

- What goals do we want to reach in our business?
- What principal goals are important to reach?
- What means have to be fulfilled in order to reach our principal goals?
- Are there any conflicting goals?

The goal analysis consists of four phases; goal identification, analysis of relationships between goals, goal evaluation, and goal formulation. After the goals have been identified from interviews and document studies and documented in a goal list, the goals are related to each other in goal diagrams. By doing this illustration it is possible to find relationships as well as conflicts between different goals. Some goals are means needed to reach other goals. This activity is also a way of formulating new goals necessary to reach the principal goals. During the goal evaluation, the goals are discussed and critically examined in order to be able to propose changes in some goals. Finally the future goals are formulated in a well-grounded way.

Analysing Problems

The purpose of analysing problems according to CA/SIMM is to develop problem knowledge and, thus, understanding of the problem situation in the business context.

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[4] Based on, for example, interviews with people working in the analysed firm, on operative, tactical, and strategic levels. Goals can be both formal ones (e.g. expressed in business plans etc.), and more informal (e.g. implicit in the organisation). The same approach is used to analyse problems and strengths.

After having analysed the problems it should be possible to answer the following questions:

- What are the main problem causes?
- What are the main problem effects (problem symptoms)?
- What vicious circles do exist?

Analysing problems means to constantly question what causes a problem has and what effects this will result in. During problem analysis, problems within the business context are identified, formulated, and analysed. The problems are documented in a problem list and then related to each other in problem diagrams. During this activity of finding causes and effects, new problems are often identified. When doing problem diagrams the problems are structured in "problem hierarchies" in order to understand which the "real" problems are, i.e. to differentiate between "real" problems and symptoms. This understanding is essential if the most important problems are to be solved. In the problem diagrams it is also possible to identify vicious circles and then find ways to break these circles.

Analysing Strengths

Strength analysis is done in the same way as problem analysis. The purpose of strength analysis is to identify and maintain aspects that are working well in the existing business context; i.e. things we do not want to change during business and information systems development. Instead, such aspects should be further developed and emphasised. The strengths are documented and analysed in strength lists and strength diagrams.

Analysing Business Processes

An important activity in CA/SIMM is to describe, analyse, and understand business processes. A business process consists of activities ordered in a structured way with the purpose of producing valuable results for customers or clients. Analysing business processes implies that different types of actions performed within a business process are described. The process logic captures how different actions are related to each other. Actions can be classified as material actions or communicative actions. When analysing business processes in CA/SIMM such information and material flows are described in action diagrams. The action diagrams can be made with different levels of details. CA/SIMM also supports business process diagrams, which is a less detailed description of business processes.

In action diagrams, sequences of business actions are shown. By describing material and information objects and relating them to activities as prerequisites (input) and results (output), the business actions and actors (performers of activities) are identified. The action diagrams show how the business works by focusing on the business logic. The action diagrams describe ordered sequences of activities, alternatives and conjunctions, conditions for actions (such as "if" or "when"), occasional actions, activities triggered by communication or time, activities interrupted by communication or time, as well as parallel activities. With action diagrams it is possible to describe all business processes within an organisation from, for example, the first customer contact to the delivery of goods. In business process diagrams the business actions are aggregated up to a higher level of abstraction.

With the understanding of business processes and business actions it is possible to suggest well-grounded changes in the organisation. Analysing business processes according to CA/SIMM should answer questions such as:

- How is the business working today?
- Who is the performer of different actions?
- How will the business work in the future if we accomplish some changes?

2.3.2 Business Action Theory

In order to understand business interaction between customers and suppliers we also use a conceptual model called Business Action Theory (BAT). The BAT framework (Goldkuhl, 1998) describes generic business acts performed by customers and suppliers. The theoretical sources behind BAT are of two kind; Language action theories (e.g. Searle, 1969; Habermas, 1984) and business relationship theories (especially the network approach and relationship marketing, e.g. based on Axelsson and Easton, 1992; Håkansson and Snehota, 1995; Gummesson, 1995). Language action theories are used to identify and characterise different communicative actions, such as offering, demanding, ordering, and confirming. Business relationship theories are necessary to give the proper business context, including interaction of the two roles. Roles and relationships as well as interactions are important concepts that have contributed to the formulation of BAT.

According to BAT a business process is divided into six generic phases[5] that are reiterated for different business transactions:

- Establishing business prerequisites phase
- Exposure and contact search phase
- Contact establishment and proposal phase
- Contractual phase
- Fulfilment phase
- Assessment phase

BAT has a focus on generic business actions, both communicative and material actions. It involves the interactive co-ordination between a customer and a supplier. BAT emphasises the generic business logic and exchange in a business process. To be able to perform a business transaction both actors must take a co-operative attitude and engage mutual co-ordination. BAT recognises thus both shared and conflicting interests.

BAT provides a symmetric view of the dyad; i.e. no particular party of the dyad is focused at the expense of the other party. BAT implies actor neutrality and gives full account to both customer and supplier, which is seldom done in the marketing literature (confer critique in e.g. Axelsson and Easton, 1992). Instead, many marketing theories seem to take the perspective of the supplier viewing at the customer. There is a need to analyse and understand inter-organisational interaction in a symmetric way. This is an issue of both theoretical and practical interests.

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[5] See also Axelsson, Goldkuhl and Melin (2000) for further development and application of Business Action Theory.

Relationships between customer and supplier can to a great extent be characterised as communicational interaction, as is shown in the BAT phases above. BAT has proved to be useful for evaluation and change of information systems and business processes (e.g. Lind and Goldkuhl, 1997; Melin and Goldkuhl, 1999).

3 Images of the Wood Industrial Network

Before presenting some images of the wood industrial network that are central for the empirical part of this paper together with an outline of a multi-perspective approach we will shortly introduce the organisational actors and some essential features.

3.1 The Studied Wood Industrial Network

Up to this date (in June 2000), we have a number of firms that are situated in a business network, so-called, wood industrial network. If we choose to look at the network as a value chain (e.g. Porter, 1985) this begins in the forest and ends with the customer of small, exclusive, houses mainly made out of wood. The value chain metaphor, however, has several limitations; for example its resource based perspective. All the firms can also be viewed as parts of an organisational network (see Figure 1).
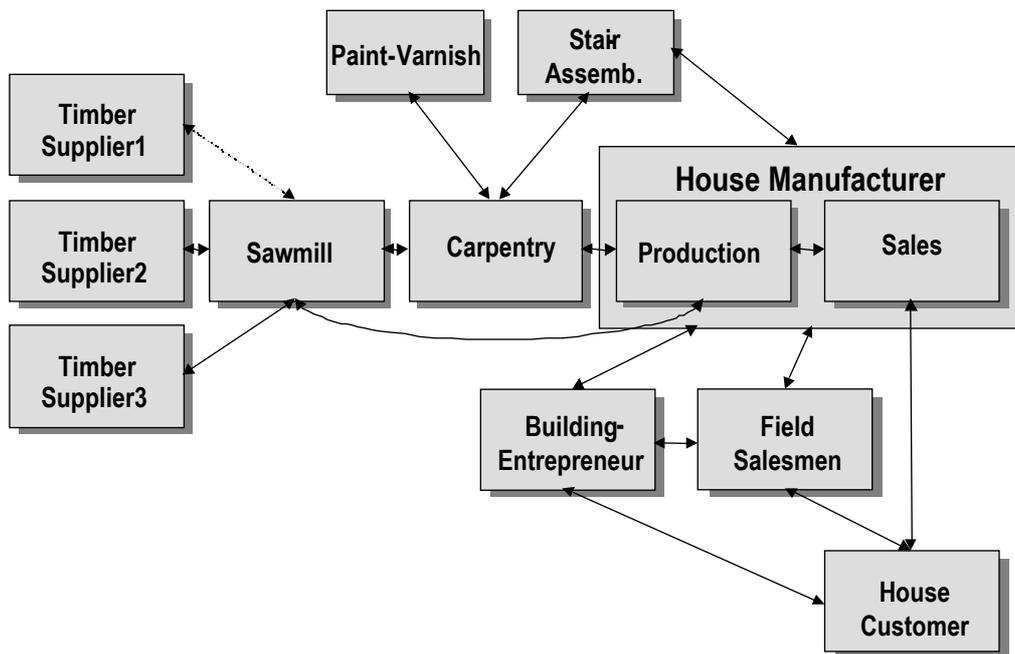

Figure 1 The Studied Wood Industrial Network

In our study we have done the most extensive empirical work using e.g. CA/SIMM (section 2.3) in three firms (based on approx. 35 interviews): the Sawmill, the Carpentry firm and the House Manufacturer. The other actors in the network, the co-producers (the Timber Suppliers, the Paint- and Varnish Firm, and the Building Entrepreneur) and the

House Customer[6] in Figure 1 above has been covered by approx. 15 interviews. The actors above are by that means the firms that we have interviewed and worked together with explicitly. There are of course other actors in the network that we have not chosen to deal with in this context.

Core Firms

The studied sawmill is a family-owned company, established in the early 1900s. The majority of the raw material comes from 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.

The carpentry firm manufactures a central component in the house-building process, the stairs. The first product was manufactured already in the 1930s and since then production has continued under various forms of organisation. 30 people are employed in the organisation today including five administrators and the two joint owners. Since a couple of years, the firm enjoys very good profitability. The carpentry firm's business concept has 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 house-manufacturing firm was established in the early 1960s. 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 70 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.

Co-producers and Customers

The timber suppliers are relative small, private, and family-owned. Two of the suppliers deliver timber directly to the studied sawmill. The other supplier deliver via a forest owner association.

The paint and varnish firm is physically located in the carpentry firm's own premises. They almost exclusively work with the stairs of the carpentry firm. The carpentry firm co-ordinates almost all of the paint and varnish firm's administration (i.e. invoices and planning).

The stairs-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 stairs-assembling firm assemble stairs, before they are shipped out. When there are consumer complaints regarding the carpentry firms stairs, the stairs-assembling firm is sent out to attend to the problem. The stairs-assembling firm also takes on assignments from different house-manufacturers and other carpentries

[6] A (house)customer that also can, according to e.g. Wikström et al. (1998), be viewed as an active part and a kind of co-producer in the network especially if the House Manufacturer is characterised as an "interactive firm".

with other products concerning taking care of consumer complaints/claims. In these cases the carpentry firm administrates the stairs-assembling firm's invoices and planning of travel routs between building sites.

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

The field salesmen is represented by one house sales office, working in close cooperation with both the building entrepreneur and the house-manufacturing firm, and one salesman permanently employed by the house manufacturing firm.

Two private house customers are also studied in the R&D-project.

3.2   Images Accentuated Using the Different Perspectives

Images of the wood industrial network from our combined use of network, imaginary organisations, and business- and systems development approach show among other things that the studied wood industrial network is a complex pattern of, often, informal relationships based on social interaction and mutual trust. The degree of adaptation is varying among different actors in the network, and changes are often "trigged" by actions and trends of affairs in the two explicit markets (the market for timber, raw material; and the market for houses, finished products). Another important actor identified for changes in the network is the Carpentry firm, that has initiated several changes in customer's choice of products, subcontractor's level of refinement, the establishment of the Paint and Varnish Firm and so on. The use of information technology (IT-systems) to support interaction in relationships is rather low. Uncomplicated technological solutions for communication are mostly used (such as facsimile and telephone).

3.2.1   Examples of Images Related to Perspectives

Below we will present some examples of images of the wood industrial network related to the different perspectives; the network approach, the imaginary organisations perspective, and the business- and information systems development approach.

The Network Approach

When the R&D-project started in 1998 the main metaphor in describing the studied empirical landscape was the value chain (e.g. according to Porter, 1985). When studying and using the network approach (Axelsson and Easton, 1992; Håkansson and Snehota, 1995) more explicitly in our project, the network as an image of the studied empirical landscape seems more and more promising. We can also relate a lot of our findings (presented e.g. in Axelsson et al., 1999) to research presented in e.g. Håkansson and Snehota (1995). The complementary use of the value chain metaphor when suitable (e.g. in the empirical field when discussing material flows from the forest to the house manufacturer) is possibly a pragmatic solution. One reason to this is that the actors in

the studied companies frequently use the value chain as a concept[7] when describing their reality.

Examples of images using the network approach are:

- The dynamics in the network has been visible for us when applying the network approach, e.g. reallocation or reconfiguration of resources, activities, knowledge and competence over time.

- When studying dyads in the network, our application of the network approach has mainly given us the content and context[8]. Process aspects seem to be focused mainly on strategic issues and long term development/changes. The business- and systems development approach by BAT and action diagrams (section 2.3.2) has, on the other hand given us mainly the content and process of the dyads (e.g. Axelsson et al., 2000). The process in the latter approach, so far, seems however to cover mainly development/changes in the operative, short term, level.

- The presence of stable and durable relationships between e.g. the timber suppliers and the sawmill, as well as between the sawmill and the carpentry firm with a low level of formality.

- The evident pressure for change even in stable, long-term relationships (e.g. between the sawmill and the carpentry firm).

- The presence of relations with organisations producing rival products (between the sawmill and another regional sawmill, also a competitor).

Imaginary Organisations Perspective

The imaginary organisations perspective (Hedberg et al., 1997) has given us the possibility to e.g. choose to look at the carpentry firm and one of the joint owner's role as a co-ordinator and "imaginator" in the wood industrial network (Melin, 2000). Examples of co-ordination actions performed by the carpentry firm in order to influence or control other actions (performed by actors in the wood industrial network) are:

- To ask an organisational actor (in this case the owner of the stairs-assembling firm) to establish basic prerequisites in order to develop new ability (e.g. to establish and invest in a new firm to assemble and install stairs both on location inside the carpentry's own workshop before shipping and at the house building site).

- To ask the existing wood supplier to develop new or refined products and services (in this case the studied sawmill). This "question" is asked with a mix of opportunity (to deliver more volume) and threat towards the sawmill (to choose another supplier).

- To have a strong influence on organisational actors operative prerequisites for action, accomplishment and follow-up of actions taken. In our case the

[7] So-called in vivo codes (Strauss and Corbin, 1990, p. 69).

[8] See the descriptions by Pettigrew (1987) of context, content and process when studying organisations and organisational change.

carpentry firm's announcement of their own production planning that directly co-ordinates the paint- and varnish firm's production (and replaces their own formal planning).

- To influence the customer demand (e.g. to buy stairs with more sophisticated design and a higher level of refinement and include that product as a standard in the houses offered together with the assemblage). (ibid.)

In this work we are also inspired by e.g. Malone and Crowston (1994) and Weiseth (1993), as well as more "classical" intra-organisational mechanisms (or co-ordination means that we rather call them) to co-ordinate activities (March and Simon, 1958; Mintzberg, 1983, 1988).

The imaginary organisation perspective has also helped us to identify that crucial resources, processes and actors also exists and are managed outside e.g. the sawmill's and the carpentry firms' legal boundary. Crucial resources outside the sawmill are e.g. the timber and outside the carpentry firm e.g. paint- and varnish equipment and knowledge. Crucial actors outside the firms' legal boundaries are the stairs assembler (for the carpentry firm) and the contracted lumbermen and agents for export markets (for the sawmill) and the building entrepreneurs (for the house manufacturer).

The Business- and Systems Development Approach

Using the business- and systems development approach (CA/SIMM, section 2.3.1 and BAT, section 2.3.2) has among other things given us:

- A systematic approach in analysing problems (identification and relationships between problems), strengths (identification and relationships between strengths) and goals (identification and relationships between goals).

- A thorough description of business processes using action diagrams (including different types of actions (together characterisation of communicative actions) and their relations, information- and material flows, information systems etc.) together with the BAT framework and its different phases.

- A well grounded, explicit base for presenting change/improvement needs to the studied firms and to encourage their improvement work (to fulfil the normative subset of our R&D-project goals).

- A rich picture of the process and content of a relation/dyad between firms and the different communicative actions performed by the supplier and customer (e.g. the offer from the carpentry firm to the house manufacturer). Evaluation of the process and content can also be done by explicitly using problem analysis in CA/SIMM (see Axelsson et al., 2000) or another kind of problem analysis (e.g. "fishbone" diagrams).

3.2.2   An Outline of a Multi-Perspective Approach

In the present R&D-project we have evolutionary formulated a multi-perspective approach partially based on our empirical experiences (Goldkuhl et al, 1999). The presented approach is our first outline of a combination of thoughts from the different perspectives presented and used above. If we take a closer look at the different aspects in

the approach presented in Figure 2 we use business actions to deal with issues in the firms "ways of doing business" and create value for customers as well as owners. By business processes we mean the processes and structures that activities are formed into from an intra- or inter-organisational perspective. Human in the approach stands for the actor that performs activities in the business processes with its competence, ability, well being, and so forth. By technology we mean the support for activities in the business processes, both material refining equipment/systems and information refining equipment/systems (e.g. information technology).

The different aspects presented in the approach can be related to the different perspectives from section 2.

- *Business actions*. BAT for understanding, describing, analysing and improving business actions and the interaction model from the network approach for mainly understanding, describing and analysing. Imaginary organisations perspective can help us to identify crucial actions and resources that take place and exist outside the legal unit of e.g. the sawmill, another regional sawmill, and the carpentry firm, the paint- and varnish firm.

- *Business processes*. A mainly internal perspective from CA/SIMM and dyads from BAT, and the dyad and network "level" reinforced and covered by the network approach. The short- and long-term issues together with operative and strategic organisational level should also be dealt with.

- *Human*. Human actors are included in all perspectives; the study of social bonds can be mentioned, taken from the network approach, as well as the actions in the action diagrams from CA/SIMM and the "imaginator" and co-ordinator in imaginary organisations perspective.

- *Technology*. When dealing with information technology this is covered by the business- and information systems development approach. Imaginary organisations perspective also deals with information technology as an important technology in, and sometimes also a prerequisite of, organising imaginary/virtual systems. The network approach and the different kind of bonds are also an example from this approach covering technical issues.

The approach can be used to relate issues concerning business processes (both intra- and inter-organisational), humans, technology, and business actions to each other in order to handle business- and information systems development in a comprehensive way and, thus, avoid sub-optimisation. The model has been used to link different research results, and it has been an important tool in our empirical case studies. Identified goals, problems, and strengths are studied through the model, which implies that a problem that has been identified as a "technology problem" also is related to business processes, human, and business actions aspects. Independent of a problem's original formulation and characterisation it is studied in relation to all aspects in the model. It is important to understand how different factors interact if a good solution based on conditions concerning business processes, humans, technology, and business actions should be reached.
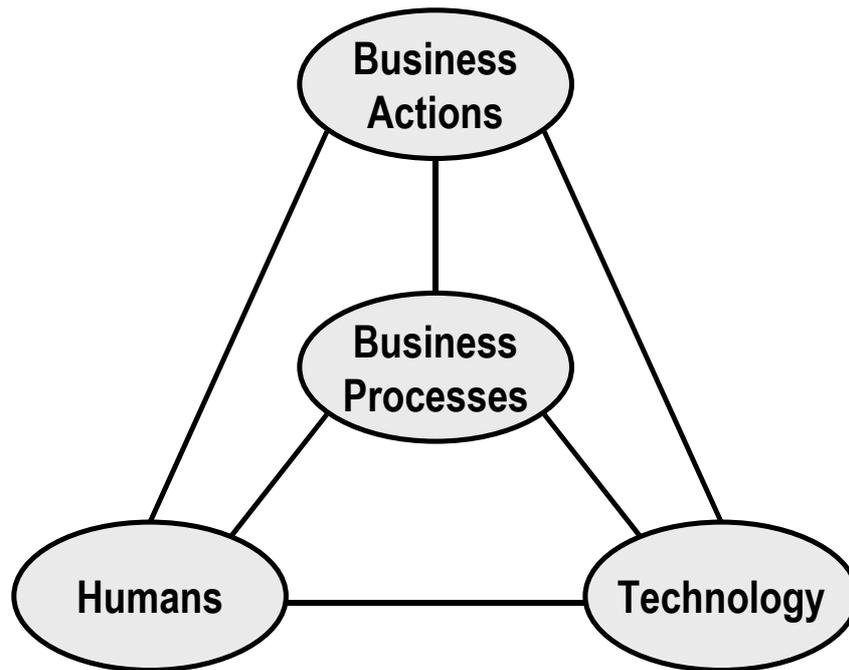
Figure 2. An outline of a multi-perspective approach

To some extent the approach presented in Figure 2 has similarities with the classical model/diamond from Leavitt (1964) that includes (organisational)structure, tasks, humans and technology and the interdependencies between these aspects. The model we present has a more explicit business and human action perspective.

The presented approach can generate questions such as:

- What kind of competence is needed for handling different technology? (Human – Technology)
- How is technology adapted for human beings? (Human – Technology)
- Are human needs in accordance with the character of work? (Human – Business Processes)
- What possibilities and limitations do technology lead to in the intra- or inter-organisational business processes? (Technology – Business Processes)
- How competitive is technology for the individual firm and relations between firms? (Technology – Business Actions)
- What social relationships (bonds, ties) have been created through business actions? (Human – Business Actions)

4   Reflections and Further Research

This section contains a short reflection and discussion of our experiences, together with some proposals for further research.

Our eclectic and explorative approach use of theories seems to be promising, but more work is to be done. This work can on one hand be done with a theoretical focus, e.g. re-

constructing the basic standpoints and perspectives behind the network approach, imaginary organisation perspective and the presented business- and information systems development (including Business Action Theory) approaches in parallel. On the other hand this can also be done by further empirical studies using and evaluating the perspectives. In our ongoing R&D-project we e.g. will perform further development of the multi-perspective approach presented in Figure 2. Of course the more theoretical and empirical approach also can be performed in parallel.

Another question one can ask oneself is if the presented perspectives should be used side-by-side or be integrated. Hultgren (2000) proposes, partially based on, and inspired by Morgan (1986), a change of perspectives rather than a synthesis of them in the context of one and the same study. We regard that as a so far open question. One can also ask oneself how different the perspectives "really" are? If a synthesis of them is going to be made a thorough critical and constructive study of basic concepts, aims etc. must be done together with reflections concerning applicability, total volume of the message, presentation forms etc.

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