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Railcarrier in Intermodal Freight Transportation Network

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ABSTRACT

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The major objective of this thesis is to describe and analyse how a railcarrier is engaged in an intermodal freight transportation network through its role and position. Because of the fact that the role as a conceptualisation has a lot of parallels with the position, both these phenomena are evaluated theoretically and empirically. VR Cargo (a strategical business unit of the Finnish railway company VR Ltd.) was chosen to be the focal firm surrounded by the actors of the focal net. Because of the fact that networks are sets of relationships rather than sets of actors, it is essential to describe the dimensions of the relationships created through the time thus having a past, present and future. The roles are created during long common history shared by the actors especially when IM networks are considered. The presence of roles is embedded in the tasks, and the future is anchored to the expectations. Furthermore, in this study role refers to network dynamics, and to incremental and radical changes in the network, in a similar way as position refers to stability and to the influences of bonded structures.

The main purpose of the first part of the study was to examine how the two distinctive views that have a dominant position in modern logistics – the network view (particularly IMP-based network approach) and the managerial view (represented by Supply Chain Management) differ, especially when intermodalism is under consideration. In this study intermodalism was defined as a form of interorganisational behaviour characterized by the physical movement of unitized goods with Intermodal Transport Units, using more than one mode as performed by the net of operators. In this particular stage the study relies mainly on theoretical evaluation broadened by some discussions with the practitioners. This is essential, because the continuous dialogue between theory and practice is highly emphasized. Some managerial implications are discussed on the basis of the theoretical examination. A tentative model for empirical analysis in subsequent research is suggested.

The empirical investigation, which relies on the interviews among the members in the focal net, shows that the major role of the focal company in the network is the common carrier. This role has some behavioural and functional characteristics, such as an executive's disclosure expressing strategic will attached with stable and predictable managerial and organisational behaviour. Most important is the notion that the focal company is neutral for all the other operators, and willing to enhance and strengthen the collaboration with all the members in the IM network. This also means that all the accounts are aimed at being equal in terms of customer satisfaction. Besides, the adjustments intensify the adopted role. However, the focal company is also obliged to sustain its role as it still has a government-erected right to maintain solely the railway operations on domestic tracks. In addition, the roles of a dominator, principal, partner, subcontractor, and integrator were present appearing either in a dyadic relationship or in net(work) context. In order to reveal different roles, a dualistic interpretation of the concept of role/position was employed.

Keywords: intermodalism, logistics, role, network views

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This research project is more or less a compilation of hard work, failures, despair, and affliction, but also of hope and joy. Furthermore, it has been educational as well. When starting this expedition my first target was to create a description in which local nets, focal nets, actors, reactors, and factors of intermodalism could be viewed. Because of the fact that research projects are affected by numerous actors of the researcher's own network, its time for me to express my deepest gratitude to the members of my own personal net for their support.

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LIST OF ABBREVIATIONS

ADIC	Analysis, Decisions, Implementation, and Control
APDIC- scheme	Analysis, Planning, Decision-making, Implementation, and Control
AAE	Actors, Activities and Events
ARA- model	Actors, Resources and Activities
BAF	Bunker Adjustment Factor
BIMCO	The Baltic and International Maritime Conference
CAC	Cognitive, Affective and Conative
CAF	Currency Adjustment Factor
CIM	International Convention for Road Transportation
CMR	International Convention for Rail Transportation
COMBICONBILL	A Multimodal Transportation Document Introduced by BIMCO
CT	Combined Transport
CTD	Combined Transport Document
DMU	Decision Making Unit
EBRD	European Bank for Reconstruction and Development
EDI	Electronic Data Interchange
ELA	European Logistics Association
ETA	Estimated Time of Arrival
FBL	FIATA Forwarders Bill of Lading
FCA	Free Carrier
FCL	Full-Container Load: a Particular Procedure in Container Transportation (compare to LCL)
FIATA	International Association of Forwarders
FOB	Free on Board
I (in parenthesis)	Interview as a Source of Information
ICC	International Chamber of Commerce
ICF	Intercontainer-Interfrigo
ICT	Information and Communication Technology
IFT	Intermodal Freight Transportation
IM	Intermodal, Intermodalism
IMF	International Monetary Fund
IMP	Industrial Marketing and Purchasing Group
IO	Interorganisational
IOR	Interorganisational Relationships
ITU	Intermodal Transport Unit
KETJU	Transport Chain Development Programme by Ministry of Transport and Communication and TEKES (Technology Development Centre)
KULTU	Operative Steering System of the VR Cargo
LCL	Less-than Container Load; a Procedure in Container Transportation (compare to FCL)
M & A	Mergers and Acquisitions
MINTC	Ministry of Transport and Communications, Finland
MNC	Multinational Corporation

MTD	Multimodal Transport Document
MTO	Multimodal Transport Operator
NVAT	Non-value Added Time
NVOCC	Non-vessel Operating Common Carrier
PMTO	Partial Multimodal Transport Operator
PCS	Port Congestion Surcharge
PRQ	Perceived Relationship Quality
PRV	Perceived Relationship Value
PSYM	Pohjoismaisen Speditööriiton Yleiset Määräykset (General Conditions of the Nordic Association of Freight Forwarders)
RATKE	Committee for Developing the Customs Clearance
R&D	Research and Development
RM	Relationship Marketing
SAD	Single Administrative Document
SC	Supply Chain
SCA	Strategic Competitive Advantage
SCANDINET	A Research Programme for Promoting Integrated Transport in Peripheral Areas of the Union
SCI	Supply Chain Integration
SCM	Supply Chain Management
SCP	Sustainable Competitive Position
SME	Small and Medium-sized Enterprise
SOC	State-owned Company
TCA	Transaction Cost Analysis
TCE	Transaction Cost Economics
TCO	Total Cost of Ownership
TQM	Total Quality Management
TEDIM	Telematics in Foreign Trade Logistics and Delivery Management
TEU	Twenty-Foot Equivalent Unit
TPL	Third Party Logistics (3PL); compare to 4 PL = Fourth party service operator/integrator
UIRR	Union Internationale des Societes de transport combine Rail-route
UN	United Nations
VAL	Value Added Logistics
VIPRO	Vientiprosessien kehittämisprojekti (a Project for Improving the Export Delivery Processes)
WUAWUG	What-you/U-ask-is- what-you/U-get- syndrome

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PART I: Theoretical Study

1. Introduction

1.1. Prologue

There has been growing interest in the network theme among practitioners and researchers. Despite the fact that infrastructural networks have been widely elaborated in logistical analysis (see e.g. Lukka and Lensu 1997, Törn 1999, Dornier *et al.* 1998), more attention has been recently based on the relationships between the nodes. In conventional infrastructural network models the ties are not explained as relationships but rather as concrete links. However, it seems that the *managerial* or *strategical explanation* of networks (networks as sets of nodes and links creating network-like supply chains) will be gradually replaced by contemporary views in which the theoretical underpinnings are different: there is a dawning of behavioural paradigm in logistics science compared to the conventional strategical one and its dominance. It is thus challenging for the researcher *to compare and contrast the two distinctive worldviews especially in logistics*, in which strategic thinking is in a dominant position.

Interorganisational themes and behaviour in general are discussed more in other disciplines, to name marketing science as an example (e.g. Halinen 1994, Holmlund 1996, 1997, Olkkonen 1998). Relationships are expressed with a variety of terms, and various dimensions have been analysed in practical business environment such like quality (Holmlund 1996,1997), gaps (Leminen 1999), temporal processes (Halinen 1994), or bonds (Järvinen 1997). More theoretical publications include writings on tying elements (Axelsson and Easton 1992, Ford *et al.* 1998) or discussion on theoretical roots (e.g. Tikkanen 1996a, 1996b, 1997, 1998). This implies that actually networks are defined as *sets of relationships*, rather than sets of enterprises as in the conventional business network theory. In addition, an IMP- based (Industrial Marketing and Purchasing Group) network tenet is a distinctive theory with its own indigenous particular rhetoric, concepts, and articulation.

Recently also *intermodalism* (IM) or *intermodal freight transportation* (IFT) have been intensively contemplated by numerous scholars (see e.g. Woxenius 1994, 1998, Bukold 1996, Adjadjihoue 1995, Muller 1995, Gröhn 1998, Tuimala and Lukka 1999, Tuimala 2000, Bask *et al.* 2001, Aastrup 2003). Intermodal transportation has been conventionally defined as *movement of unitised goods with at least two different transportation modes*. This specific mode of transportation is interesting for scholars analysing interorganisational behaviour since it is assumed that intermodalism can be viewed as a total logistics service offered by a network of different organisations. Accordingly, this form of combined transport provides a testing ground to study the themes and dimensions of interorganisational behaviour more exhaustively. The required degree of co-operation is presumable higher in the network of dependent intermodal operators compared to situations in which single modes act.

There is no real intermodalism without active participation of all the parties involved and without tight relationships between the operators and facilitators. The parties can be service providers (carriers, freight forwarders, transportation companies, port operators), agents, stakeholders (e.g. towns, regional associations), customers (shippers, receivers), or others (customs, even trade unions). In this study, VR Cargo (a strategical business unit of the Finnish railway company VR Ltd.) as a *railcarrier* is the *focal firm*.

It can be assumed that with and through relationships the actors create, perform and capture roles and positions, which also stem from the network involvement. In contrast, the infrastructural networks explaining IFT are conventionally regarded as systems of nodes, links, and functions. A new perspective providing new mindsets both for the theoretical analysis and more influential business practices can be employed by addressing the tasks, roles, and expectations of the operators (multitude of various behavioural acts and episodes). Furthermore, it is assumed that an actor might have different roles in the network depending on whether the role appears in a dyadic relationship or in the network context. The analysis of roles and positions requires in-depth discussion of the dimensions of the relationships as well.

There seems to be growing interest in railway operators e.g. in the European Union because of their specific role in more advanced intermodal transportation systems. Moreover, the liberalisation and increased deregulation enforce the railcarriers to seek for new strategical activities (see chapter 2.1. for more detailed discussion).

1.2. Scope and Objectives

The major purpose of this study is to *analyse and describe the engagement of a railway company through the roles and position* in a rail-based intermodal network in Finland. The concepts mentioned above can be regarded as expressions of the network involvement. Because of the fact that networks are sets of relationships rather than sets of actors, it is of notable importance to describe the dimensions of the relationships, created through time and thus having a past, present and future. The roles are created during the long common history the actors share especially when IM networks are considered. The firms are engaged in the networks as actors; the presence of roles is linked to the tasks, and the future is anchored to the expectations. In all, the roles are created because of the historical record the actors have, and because of events, tasks, and expectations. Inevitably, the relationships have a real state and an ideal state, having an impact on the roles and on the tension a dyadic relationship might have.

Though role as a term could refer to network dynamics, and to incremental and radical changes in the networks, in a similar way as position refers to stability and to influences of bonded structures (see e.g. Mattsson and Johanson 1992, Anderssen *et al.* 1994, Anderson *et al.* 1998), a more intricate conceptualisation will be suggested. As mentioned, intermodalism as a form of action is interesting, as it is assumed that intermodalism is a total logistics service, requiring synergic performance by a network of different operators. Thus, the phenomenon can be also an application area for discussing both the network development and the stability. The position is not only influenced by the role of the company - whether it be theoretically an actor, reactor, or interactor - but also by how an operator is embedded in the network.

Though the two distinctive terms (role, position) have a vital role in the present research work, the objective is to utilise the terms as tools, than generate new theoretical proposals. With an attempt to express the logic of network behaviour, the novelty of this thesis is that in it IFT is discussed from a newer perspective addressing interorganisational co-operation rather than physical processes alone: the development of intermodal freight transportation is not just a question of interoperability, it also requires a common will to cope with the issues of interorganisational collaboration. Moreover, one of the major challenges is to apply the conceptualisations of the network view in intermodal industry. The terms of change and stability - though a bit misty and vague in nature - can be appropriate tools for evaluating the dynamics in the network under consideration.

Theoretically, *five* distinctive levels are proposed; besides *network level* also *dyad*, *triad*, and *chain* as well as *net level* are evident. The network level consists of not only all the participants in the intermodal transportation industry, but also of the actors who can influence directly or indirectly the practices in the field (e.g. domestic stakeholders). Furthermore, on the net level there are networked operators working together in some smaller unit. The nets can be geographical or social or they can be based on common technology or actors' perceptions of the surrounding reality. Furthermore, they are identifiable subentities of the network. Occasionally, the term value net or strategic net are used to describe these nets. Triads represent the smallest nets theoretically possible. The dyadic level refers to a relationship between two operators called actors.

The figure 1.1 depicts the potential levels for investigation: the shaded area is a representation of the focal firm, or its units.

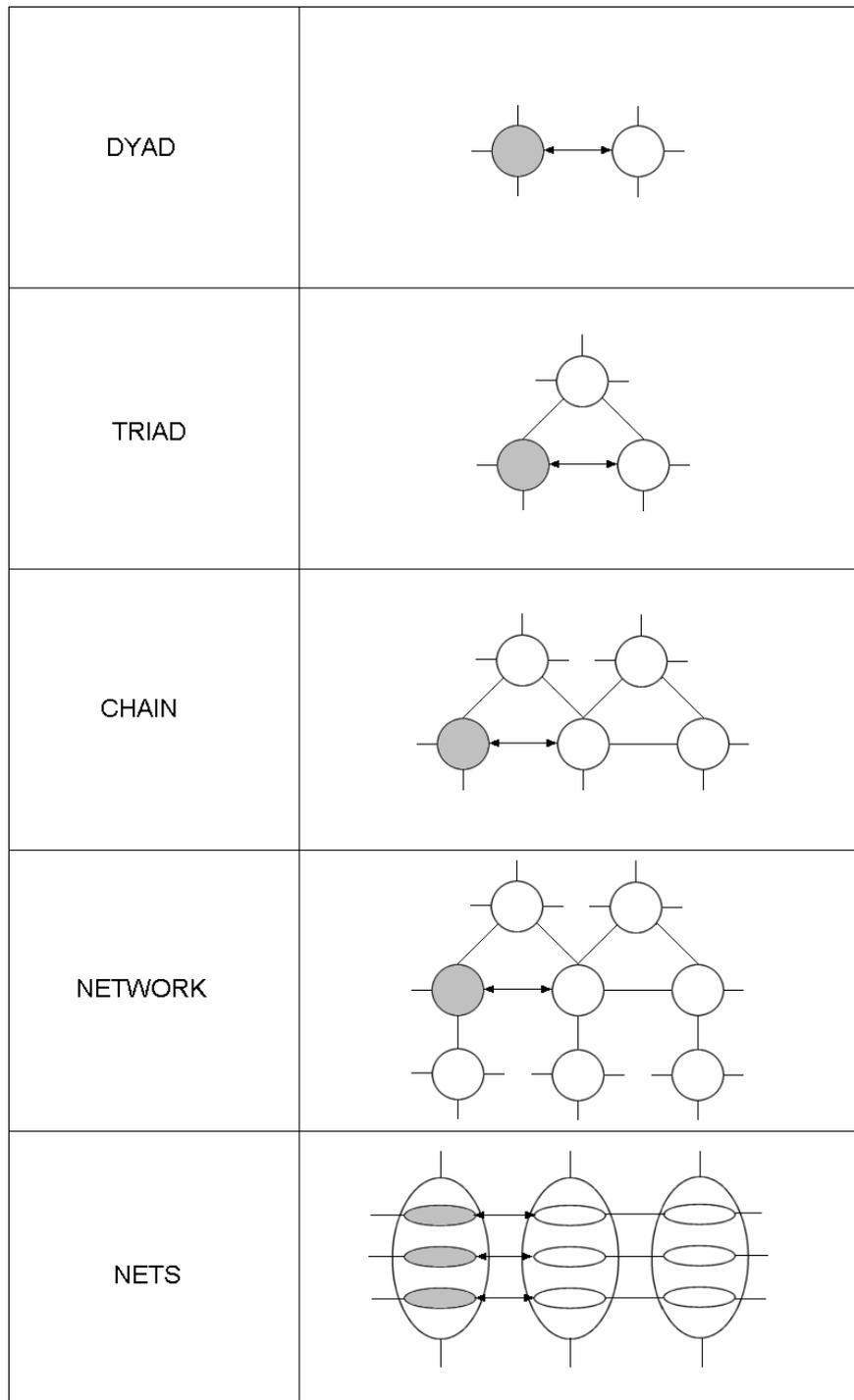


Figure 1.1 Levels of Network Structure

Practically, this study relies mainly on the dyadic constellation, examining the relationships in the nets and the network. In general an IM network is created by various actors on different locations both in the domestic marketplace and abroad; though influential, the analysis is not explicitly associated with the present study. The triadic relationship is implicitly included in the analysis. Though dyadic relationships are mainly considered, inevitably the pairwise relationship influences and is influenced by the network behaviour and strategical outlines amidst other net members. Very often relationships, (including the social dimension), are created through personal interaction. Arguably, the influential decision-making takes place *on the net level, not on the network level* (see subchapter 2.5. for more discussion). Also, network identity is created with the help of relationships in the nets particularly in the IM network, in which the number of persons is limited, which both creates opportunities for the co-operation and later maintains the continuity of the relations.

In logistics science the managerial, or strategical approach (as represented by the supply chain thought) has traditionally strongly affected not only the preferences of the strategical decision making, but also the research work. In the present study, however, a more modern conceptual approach is employed, which involves testing the relevance of the network theory particularly in accordance with the IMP school of thought. Hence, it is of great importance to *contrast the two distinctive views theoretically* before more intensive empirical analysis.

The study is divided in to **two parts**: **part 1** contains a *theoretical discussion* - based mainly *on comparison of the two distinctive network theories complemented with the consultation with practitioners* – whereas in **part 2** an *empirical examination* is presented. The structure of the thesis is explained in closer detail in chapter 1.5.

The main purpose of the theoretical part of the study is to answer the question:

How do the two distinctive views that have a dominant position in modern logistics – the network view and the managerial view (represented by the Supply Chain Management theory) differ, especially when intermodalism is under consideration?

Two approaches - the network view as explained by IMP Group (Industrial Marketing and Purchasing) - and the managerial network thinking/supply chain management/SCM - give a researcher tools for explaining and depicting some of the features in intermodalism and interorganisational behaviour, although in the SCM-based theory intermodalism as transportation function is often a minor part of the supply chain. More important is that the SCM line of thought is a reflection of the managerial view and thus it undoubtedly affects the explanations of intermodalism as well.

Though the two views have been thoroughly discussed in marketing science (e.g. Tikkanen 1996a, 1996b, 1997, 1998), they have not been contemplated in logistics so far, although some suggestions indicate that the modern research approaches the network view (Cavinnato 1999). In this study, the IMP-based theory is not widely analysed (see e.g. Nikkanen 2000 for a summary). Furthermore, SCM is widely applied and explained in the state-of-the-art literature for logistics (e.g. Mentzer *et al.* 2001; see also chapter 4 in the present study).

Networks have *very strong geographical aspects*. Though spatial dimensions (e.g. friction, impedance, proximity, location, inconvenience) are implicitly associated with the conventional network analysis, more detailed description is required. Therefore, there is a vital need to link the questions of spatiality - e.g. interorganisational proximity - to network analysis. Besides, the significance of embeddedness in network studies means that the spatiality should be deliberated; embeddedness can also be interpreted as involvement in dyadic and network relationships (Oinas 1998, 64).

To operationalise the tasks for the ***theoretical research process*** in the present study the following *four* sub targets have been identified:

The *first objective* is to analyse the *content and dimensions of the relationships* including the bonds of a dyadic relationship. This is conducted by applying the network view, and requires consideration of the interorganisational processes and outcomes as well as the structural elements of the chosen network. Also, a comparison of the network approach to conventional managerial explanations is made; this is needed because the managerial view dominates in traditional logistics research. One of the main targets is to *evaluate* and test whether the IMP-based network theory is an adequate *tool for describing the phenomenon of intermodalism*, and more specifically, *the interorganisational roles*, and what could be the *contribution of this theory especially when contrasted to more established explanations*.

The *second objective* is to depict and *conceptualise the actor behaviour on multiple managerial levels*, linking this phenomenon to outer reality, in which the activities take place. The *third objective* is to *create a general tentative model* for describing the actor behaviour, which indicates the dimensions and antecedents of the concept of role and position (and commitment) and the ingredients of a structurally bonded network. The *fourth objective* is to reveal - if any can be found - *strategical, managerial and theoretical implications* based on network theories, which will give guidance for the empirical study as well.

From ***empirical point of view*** one of the major tasks is to *apply the network view in accordance with the IMP school of thought*. This is achieved by *specifying the multitude roles of the focal firm* on the basis of empirical evidence. It is assumed that these roles are not just based on functions (as presumed in the managerial view) but based on behavioural elements as well. Also, discussion on the *inherent aspects and attributes of the network involvement* (e.g. actor bonds and bonding mechanism, nature of engagement, state of the relationships) is required. Pragmatically, some interviews have been conducted to absorb the perceptions of the operators in the focal net. In all, the aim is to test the relevance of exposed concepts in analysing intermodalism, regardless of the fact that empirical verification is difficult.

The major theme of the entire thesis can be formulated as follows:

How is a railcarrier engaged in an intermodal freight transportation network especially through its role and position?

In other words, how can rail-based intermodal transportation be explained considering the focal firm's involvement in the IM network, by addressing the concepts of role and position, which are outcomes of the *structural and processual elements* of the

interaction in the network. Because of the fact that position as a conceptualisation has tangents with the role, both of these will be discussed and analysed, as well as the question of engagement. Furthermore, the structural elements of the applied theories and the dimensions of the relationship creation procedure need to be analysed.

1.3. Challenges of Intermodal Research

As noted above, intermodalism as a form of interorganisational activity can provide a testing ground for research work. It is important to describe the role and actions of all the participants of the network, not just the ones of operators, which is more typical. A well-working intermodal chain is highly capital and knowledge intensive. Without investments from both the service providers' and stakeholders' side, no improvements will occur. The actions of all the actors should not be just reactive, but also proactive – and in accordance with the network thinking – interactive as well.

When planning and implementing new strategies, many firms have realised the importance of *alliances, partnerships or other collaborative arrangements* in business as a response to competition. The number of studies in this area is abundant, extending the scope of interest from a traditional seller/vendor-buyer relationship to other fields. Furthermore, the integration of service providers (e.g. freight forwarders, carriers) to logistics processes in general has caused more interest among scholars. The result of this evolution is that for instance the term alliance economy is widely accepted among researchers' as are the concepts customer relationship management, strategic alliances, or partnerships (see e.g. Tuimala and Lukka 1999, Tuimala 2000 in IFT). It is hypothesised, however, that *partnership studies represent more a managerial view, because of the different theoretical underpinnings.*

The development – the diverse explanations - can cause some problems because of the fact that logistics as a science is fragmented, which means that the researchers concentrate on some niche in their investigations. Many researchers argue (see e.g. Woxenius 1998 for IFT) that there is need for a *holistic view* which is an idea of gathering and combining the main points of many disciplines. On the other hand, some researchers dislike the recent trend in logistics: the enhanced topics and broad approaches on the managerial level (e.g. New and Payne 1995). According to these scholars the normative procedure for generating new practices is first to find all those trendy words, then re-designate the field and ultimately '*expand the horizons*' by using the buzzwords of logistics (New and Payne 1995, 60). However, theoretical explanation on intraorganisational behaviour requires aid from supplementary topics like sociology, social exchange theory or even psychology, when the interfirm activities are discussed more closely.

One of the main points in this study is to describe different forms of collaboration among operators in railway-based intermodal chains and networks by testing appropriate theories. From theoretical point of view there are numerous studies portraying the buyer-seller relationship (see e.g. Coyle *et al.* 1996), some describing the integration of carriers in these dyad systems (e.g. Gentry 1996), but a limited amount of academic literature addressing the formation of carriers', operators' and facilitators' mutual relationships and later, the service providers' role in the network of different facilitators (c.f. Tuimala 2000). Because of the fact that there will be an organisational restructuring of railway companies, their subsidiaries, and inherent partners it can be

claimed that implementation of vital, future-oriented strategies is an obligation if higher performance is targeted. This requires analytical methods for understanding the relationship creation procedure, as well as some insights how an operator can pursue the network logic.

In general, and based on earlier studies on intermodalism (e.g. Woxenius 1994, 1998, Bukold 1996, Adjadjihou 1995), it can be suggested that there is need to bridge the gaps between different views in logistics research specially in the field of transportation, such as

- from technical-based orientation (intermodalism rather as a technical consideration in an infrastructural network referring to interoperability) to a more interactive-driven and relationship-based approach emphasising the structural dimensions and addressing the societal processes incorporated into them,
- from single mode case (intermodalism described as a combination of more than two modes) to multimodal and intermodal analysis,
- from a simple supply chain ideology with upstream and downstream activities to extended chains,
- from the vertical dimension to horizontal co-operation and to network explanation with multi-directional relationships,
- from seller-buyer dyad to third party or fourth party involvement; the use of network analysis when describing triadic or other forms of nets,
- from road-based focus to examination of rail-based intermodalism and finally
- from the explanation of 'real processes' (physical and concrete by nature based on business purposes) of moving unitised goods (of intermodal freight transportation) to the analysis of 'virtual processes', which often, but not always, take place in social interaction (organisational exchange, adaptation, and co-ordination).

Figure 1.2 summarises some of the differences between the two distinctive views by addressing the discrepancies between the co-concepts of real and virtual processes,

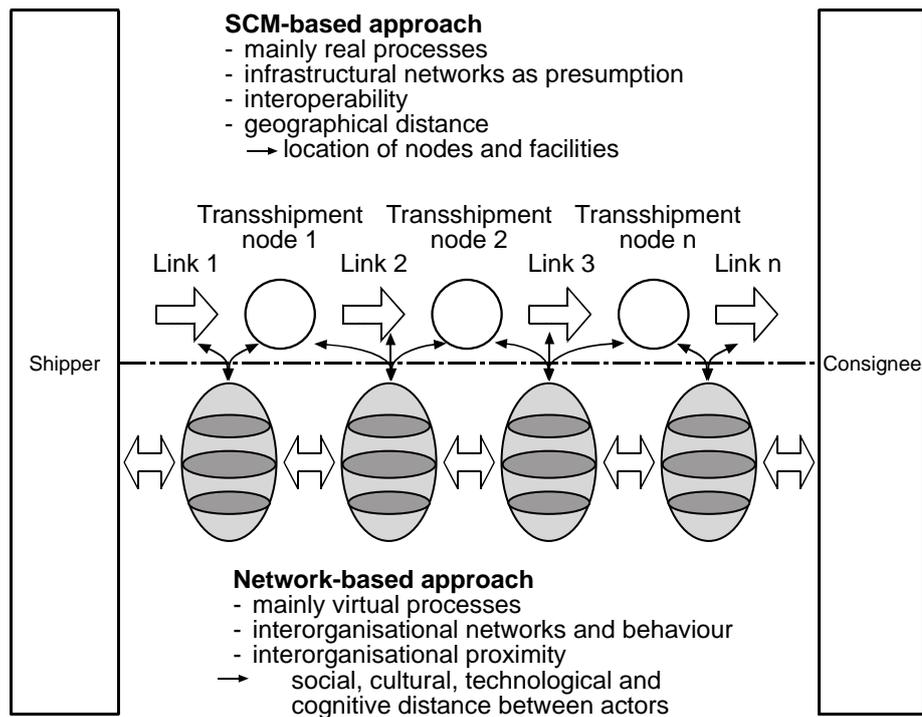


Figure 1.2 SCM Model in Contrast to Network View in Explaining IFT

The SCM-based approach with its strong emphasis on the real processes gives a solid basis for understanding the operational IFT, which undoubtedly influences the virtual ones (see chapter 4 in this thesis). Inevitably, these two major entities are strongly interrelated: the real processes influence the virtual ones and vice versa. The network approach examines the intermodalism from a different angle, addressing mostly interorganisational themes (see chapter 3). Furthermore, spatial issues should be added to the network analysis though e.g. the question of distance has different meanings under different explanations (see chapter 4). Presumably, the analytical frame presented above increases slightly the generalisability of the analysis, because it can be used in other settings as well; on the other hand, it can reduce the practical benefits of this research project, too.

In the theoretical part of this thesis some of the suggestions (e.g. the use of relationships as links in explanations) mentioned above are aimed to explore first more *theoretically* based on *an intensive literature survey complemented with the results of discussions with practitioners*. The *empirical analysis relies on the interviews and concepts as explained and predefined in the theoretical part*. It could also be hypothesised that IMP- based network thinking in general can contribute to the discussion by highlighting more deeply the dimensions of relationships as well as the actor bonds. The concrete links between the nodes are more deeply addressed under their managerial explanations. Undoubtedly, *both* the real *and* virtual processes should be considered.

The intermodal system/network reflecting the different, often contradictory needs and goals of actors is inevitably a complex and obscure field for research. Unimodal analysis has conventionally been the most employed form in transportation science. This means that intermodalism as a combination of different modes is a part of a transportation system (see e.g. Ellram and Krause 1994, Coyle *et al.* 1996). Moreover, when the number of operators is increased in long chains, it can be assumed that the complexity of the entire system will be even multiplied. With the help of a holistic approach the researcher can try to eliminate, avoid or reduce some of the problems caused by the practice in which the issues of complexity are analysed mainly with one approach.

Many researchers argue (e.g. Bukold 1996, Woxenius 1998, also Lumsden *et al.* 1998, 63) that when researching the problems of complex systems, the rejection of the mono-discipline approach can be a starting point giving new ideas for the research. However, some researchers claim that there are several drawbacks with the multidisciplinary approach that can be considered either-or- problems. Either the researcher is focusing on artificial and abstract problems (and less real world explanations) or is interested in ‘*real issues*’ (losing the ambiguity of the real world; New and Payne 1995, 62).

This study may contribute the theoretical discussion on intermodalism as well. The interorganisational studies have approached the iterative working practices, which includes a continuous dialogue - even debate - between all the parties whether they are scholars, researchers, or practitioners. This is needed in order to ensure the validity and reliability of the working process and the consistency of the results. In this sense the explanations can contribute to the theoretical discussion on intermodalism by addressing the interorganisational themes and the interactive nature of the transportation system from a different angle. It is also hypothesised (see e.g. Cova 1994) that *no unconditional findings approved uniformly by all the parties exist anymore* because of differences *in context*. This is especially true in social sciences. Researchers more *suggest* than they *claim*. However, by raising the abstraction level, some regularity can be identified and explained, with limited generalisability, however.

1.4. Research Methods

In general, research relies both on theoretical discussion and empirical testing. After intensive comparison of two major approaches in modern logistics, a qualitative method is employed in the present study. Practically, the working process is based on *the idea of iteration* having distinctive stages to go through. The practice, thus, approaches the subjectivist view in which the dialogue between theory and practice is highly emphasised. The idea of iteration means a *recurrent and continuous dialogue* between the theoretical foundations and the empirical examination.

The following illustration depicts graphically the logic of the (deductive)-inductive cycle, and interplay between theory and *empiria*.

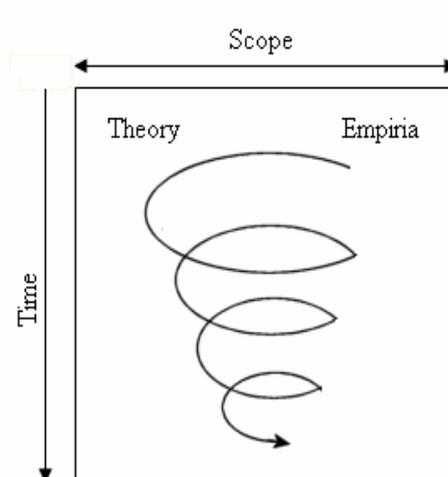


Figure 1.3 Iterative Research Procedure

In this study the main emphasis is on rail-based solutions, underlining the roles and position a focal firm might have. Because of the fact that there is only one operator for railway cargo transportation in Finland, the role and connections of the VR Cargo as a business unit of VR Ltd. are undoubtedly highly emphasised: *VR Cargo* as a representative of a railway company and its business unit is *a focal firm* and *the operators for transporting or handling unitised goods* are participants in *a focal net*. The simplest form of a net is a *triad of three facilitators*.

The empirical investigation consisted of loosely structured interviews with selected informants, and later – once the focal net was defined together with the representatives of the focal firm – deeper discussions based on a semi-structured questionnaire.

The following depiction describes the logic of the research procedure. The model is adapted from a presentation made by Pettigrew (1998, 344), when he addresses the utilisation of processual research in organisational studies. Accordingly, the research work could be an open-ended process of inductive reasoning and pattern recognition. The stages of the research process are more deeply discussed in chapter 7.

It is worth noticing that the gathered results have been interpreted and analysed before entering next stage. Besides, although the illustration has an appearance of a linear process, many of the research acts were done simultaneously, and even in the reverse direction, implying a loop-wise procedure. Hence, the researcher aimed at making intermediate synthesis of the information that was in use at a specific moment. Especially this was true when coping with conceptualisation; some of the theoretical definitions (e.g. role, position, and the dimensions of the bonding) were enriched by the preliminary discussions with the practitioners.

Limitations of the Study

As regards the limitations of the study, geographically the main emphasises is *on national routes* and service packages inherently incorporated into them, but also some of the international ones were included in the discussion (transit, eastbound, and westbound). Furthermore, dyadic relationships - a railway company vis-à-vis a counterpart - are mainly under investigation. Because of the fact that a railcarrier has quite a large number of counterparts in IM business and relationships, some of the *most important ones were selected for the in-depth analysis* (focal net instead of entire IM network). Hence, the operators and facilitators that have a direct relationship to rail-based intermodal network are of major interest in analysis. However, some of the partners that were chosen have just an indirect relationship for the focal firm; a relationship can exist without economic exchange. Especially in the first round discussions with the practitioners, the net of local operators and facilitators in South-East Finland was highly addressed.

Often a major problem for the researcher is to find an appropriate balance between *the scope and extent of the analysis* and *the depth of the investigation*. Because of the fact that in logistics science interorganisational networks have not been exhaustively analysed, in this thesis the fundamentals and structural elements of the IMP-theory are quite a widely explained. In general, the elements of the industrial network theory have been well documented elsewhere (see e.g. Axelson and Easton 1992). Regarding the empirical analysis and due to the fact that a large number of informants were selected as respondents, time-consuming and disconcerting methods (e.g. many consecutive interview sessions and intensive observation) for gathering information were not applied. Most of the informants would very likely declined to participate in the research project if the methods would had caused disturbance. Hence, the depth of the investigation on the dyadic level is a modest one.

1.5. Structure of the Thesis

In this study intermodalism is mainly regarded as a network phenomenon influenced by interaction among actors, generating roles and positions and need for the network involvement. What comes to applied theories, two major theoretical explanations are concerned in this study:

1. the IMP- based perspective (industrial networks/the network theory/approach) with interaction model as a basis representing the network view; close to the behavioural paradigm; mainly in chapter 4), and
2. the Supply Chain Management model representing managerial or strategical view (also partnerships, alliances; compared to strategic paradigm; mainly in chapter 5)

The Transaction Cost Approach (TCA) is briefly examined as well, because it provides a theoretical background especially for the managerial view. Basically, transaction cost analysis combines adequate theories *'to determine the best type of relationship a firm should develop in the marketplace'* (Virolainen 1998, 80). Spatial interaction models addressing the question of proximity in the network are also scrutinised; at the extreme, the business relationship is either a close one (as in nets) or distant (as in a network). Also, the contribution of modern marketing theory will be partly employed. Because of its role as a *co-subject* to the topic of this thesis, the theory is discussed briefly in Appendix 1. Some of the findings and proposals of the modern marketing theory are utilised as implications in this thesis, namely the processual view for explaining the relationships and interaction (Grönroos 1997), acceptance of coherent pluralism (Cova 1994), the idea of the intersubjective nature of modern science (Gummesson 1998) and in general the interest for studying the networks. Moreover, modern marketing theory is one of the major sources of the logistics research of today (see subchapter 2.6. for more details).

1) The dualistic classification employed in this thesis is just one attempt to examine different network approaches. In fact, it can be even misleading. Namely, it can be asked to what extent the IMP-perspective is different from modern marketing thinking - it is just a linkage from classical marketing ideas to new ones, thus even preparing space for a paradigm shift. Tikkanen (1997, 54) proposes five different models for interactive/RM studies, including the IMP Group interaction model and a RM model presented by Gummesson. Besides these two, he suggests three other models: the Dyadic Interaction Model by Wilson and Möller, the Cranfield Six Markets Model, and the Marketing Strategy Continuum by Grönroos. In Scandinavia the Uppsala School has mostly influenced the research practices (Tikkanen 1996b, 53). Furthermore, a typology presented by Araujo and Easton (1996) classifies ten different network approaches, of which the IMP-based tenet is associated with industrial network studies. Moreover, Olkkonen (1996, 153) proposes five different models for RM of which three - Gummesson's 30Rs model, the Strategy Continuum by Grönroos and the Cranfield Model - are parallel to the models presented by Tikkanen (1996b). Regarding the marketing philosophy *per se*, three mainstreams can be distinguished: *consumer, service, and industrial marketing*; of these perspectives industrial marketing is close to the network view. For many scholars these two approaches are rather identical; e.g. in the wording of Gummesson marketing is actually *networks, relationships, and interactive processes*. In addition, the network approach can be coupled with spatial issues (compare to classification by Kamann 1998, Törnroos *et al.* 1995, Castells 1996): e.g. infrastructural features are associated with societal processes and theories.

Some preliminary findings have been presented elsewhere (see Nikkanen and Lukka 1999, Nikkanen 2000 or Nikkanen 2003 for details). In order to give an overview for the study the *contents of the thesis* are described briefly below; *short descriptions of the major terms* are also given.

In **Part I, chapter 1** gives some background for the thesis regarding the interorganisational aspects and intermodalism in general. From theoretical point of view, some suggestions between the two views are explained as well. In addition, the major research problem is presented, and the structure of the different stages in the research work is presented.

Chapter 2 includes conceptualisations and definitions for intermodalism. Besides, the modelling of IFT is presented as well. Because of the fact that the two distinctive theories under consideration have a lot of differences, which stem from the theoretical underpinnings, some attention is paid to the theoretical discussion by revealing the trends of modern logistics thinking and how these new suggestions influence the logistical analysis: both strategic and behavioural paradigms are presented. Also, three concepts for the actors' surroundings are discussed: the environment, which actually refers to '*external conditions or surroundings, which influence (...the) development and behaviour*' (Collins 1992), the context, which is '*the circumstances that are relevant to an event*' (ibid.) and embeddedness. In general embeddedness refers to network involvement. These issues are dealt with, although it is clear that it is a difficult task to cope with the concepts – e.g. Ford *et al.* (1998, 237) argue for embeddedness that although it '*is a key ingredient in business networks (...) it is difficult to handle*'. This is because '*there are so many connections (on the network level)*' and '*they (the connections) are impossible to grasp in totality*' (ibid.; additional comments in parenthesis by the researcher).

The key concepts of **chapter 3** are the role and position complemented with a description of the basic elements of the IMP-based view (e.g. metaphorical thinking, elements of interaction, processes and outcomes, the idea of bonding mechanism). In **chapter 4** a synthesis of the SCM is made, particularly in contrast to the network view with special attention to describing the relationships. Spatiality, which is regarded as one of the major components in network studies is included in the theoretical analysis: the issues of location, proximity, and friction in general are addressed as well. Even the question of embeddedness requires an analysis of the spatial issues. Finally, the major limitations of the managerial view for describing IFT are presented. In **chapter 5** managerial, strategic and theoretical implications are described including a tentative model for clarifying the major themes of the empirical part of the study. In general, this chapter sums up the theoretical findings and contrasts the two distinctive network views.

In the beginning of **Part II** in **chapter 6** the research method is presented including the stages and the tasks of the research process. Justification for the chosen method is offered. **Chapter 7** includes the results of the interviews, and exposes the different roles for a focal actor by means of a role typology. Also, some other empirical results are presented, including a discussion of the engagement in general. In **chapter 8** the summary and conclusions of the study are presented. In the second part of the study one of the major tasks is to analyse to what extent the findings of the empirical research either support or disconfirm the proposals made in the theoretical part of the study.

2. Modelling Intermodal Networks

In this chapter various ways to define and conceptualise intermodalism or intermodal freight transportation are discussed; the examination relies on the presentation of role of the intermodalism in transportation research. One of the major objectives is also to *position the approach/s and methods* to recent logistical paradigms. This is needed, because the researcher has to *'place the present research in a wider context and for presenting the framework of theories and approaches applied'* (Woxenius 1998, 37). The present research in logistics is discussed by presenting the behavioural and strategic paradigms (subchapter 2.6.) However, prior to this, a discussion on *modelling* and more particularly the issue of *causality in intermodal research* is needed. Because it is also necessary to examine the *outer reality*, some conceptualisations are discussed in a detailed manner; every phenomenon that is analysed, should be linked to some broader entity.

2.1. Intermodalism in Transportation Research

It has been assumed that in Europe the role of railway companies will change drastically in the near future (see e.g. MINTC 1998). This trend might mean that on European level there will be a reconstruction of railway companies and their subsidiaries. In the development process the railway organisations have to find a new position and tasks in a network of several other operators, participants, and service providers. In order to speed up the development, the European Commission has launched special programmes for revitalising the rail-based transportation industry. In Finland the Ministry of Traffic and Communication (MINTC) has made a proposal to open the tracks for free competition in the near future. Though many of the challenges for railway companies are technological/technical matters implying interoperability, the organisational aspects implying stronger interfirm behaviour between the partners involved and cohesion are of great importance.

However, the managerial urge for changes among railway companies has been quite slow on pan-European level regarding the organisational, operational, or collaborative issues. It is thus challenging for the railcarriers to trace co-operative arrangements more proactively with inherent partners and other service providers. This means also that the numerous relationships these companies already have can be utilised and developed. Furthermore, the portfolio of relationships with other firms as well as with stakeholders could lead to a situation where these relationships could be regarded as intangible assets. From strategical point of view this has several implications for planning, implementation and other similar activities.

In general the growing interest for intermodal transportation can be explained with the following *four* reasons:

First, a common acceptance on European level to support and develop intermodal transportation for numerous reasons, such as for the sake of a better environment (reduction of emissions is achieved through a better balance between modes), congestion relief (the total costs caused by this effect), and safety (shifting traffic from modes with high accident rates to ones with lower rates; European Commission 1998). In this evolution process railways should have a more active role.

Besides technological improvements, also extended interfirm activities are needed in order to fulfil the tasks required by the external, often administrative decision makers representing public authorities, the national railway companies are still strongly connected with. Some of these interorganisational tasks are behavioural in nature and require attitude change in a fairly stable and conventionally behaving transportation industry.

Second, a well-working intermodal transportation freight chain requires explicitly more intensive and deep co-operation between the participants. Hence, a range of collaborative activities are needed on different managerial levels to ensure the success of the performance. Compared to unimodal and multimodal transportation, the level of interaction required between the partners involved is significantly higher. Besides, the degree of integration should be high enough to ensure total effectiveness of the entire system. As a function *intermodalism* even serves a researcher to *test and analyse the ability and willingness of the partners to co-operate closer*. Intermodalism can be defined as an aquarium in which the deeper interfirm and integrative activities occur between the actors. In intermodal freight transportation at least four parties' involvement is a necessity: besides a shipper and a consignee representing the primary actors, also two modes and operators, respectively, are needed. Crucial for these operators in the future is to integrate infrastructural facilities (like ports) and organisations and firms to intermodal networks. In this sense, it is challenging for the people representing *academia* to bring new mindsets for the logistical research, which has been dominated by the technical approach.

Third, intermodal transportation (e.g. transportation of containers) can represent a *growing business* - at least in the long run - for domestic and local operators, e.g. in transit freight regardless of the increasing rivalry in the Baltic Sea region. This type of activity is important for the partners involved in railbased transit; besides VR Cargo also the port operators, agents, and customs profit from increased volume in container traffic. In addition, the stakeholders mainly favour the enlargement of business activities in Finnish transit routes in terms of investments and other incentives due to the expenditure it gives to a certain region. A lot of initiatives have been taken by e.g. regional associations to enhance the traditional transportation activities with new strategies, thus aiming at implementing the ideology of value added operations. Furthermore, intermodal freight transport can include a mechanism for adding the value for the customers.

Fourth, if - and when - the market share of intermodal transportation will grow slowly in the long run compared to unimodal solutions, not just intermodal competition but also intermodal complementarity will occur. This implies that the control of functions of freight transport will gain importance, especially in transshipment points, which are mainly the local ports (Frybourg and Nijkamp 1998, 16). As a result hierarchically organised and functionally specialised logistics centres will arise for the entire supply chain.

Despite of the positive features revealed by the numerous observations, the enhancement of intermodal transportation has been very difficult. In Europe some co-operative organisations have developed intermodal transportation (combioperators, Intercontainer-Interfrigo, UIRR). Regarding intra-continent container traffic, ICF is a

dominant operator, whereas UIRR concentrates mainly on piggyback transportation.¹ In Finland VR Cargo has launched some domestic and international services for intermodal purposes. However, it has been argued by many of the practitioners that though intermodal freight transportation is accepted as a new, and prospective mode, on operational level poor profitability has been a problem. Sehested (1998, 37) captures the thought and attitudes of many of the practitioners when he claims that *'the truth is that nobody makes money with intermodal solutions today'*.

2.2. Conceptualising Intermodal Solutions

There are different ways to define intermodalism, or intermodal freight transportation (IFT). Intermodalism is typically described with technical means. The use of more than one mode of transport using ITUs (Intermodal Transportation Units such like containers, swap-bodies, or semitrailers, even standardised boxes) is obviously the most common way to express the details of this fifth mode of transport. As Woxenius (1998) states for intermodal transportation freight, the following two components (besides the definition of ITU) are critical:

- the goods shall be transported in unbroken ITUs between two points, and
- the ITUs must be transferred at least once between the sending point and the receiving point.

With his statement Woxenius (1998) implicitly describes the use of two different transportation modes. A proposal by Gröhn (1998) depicts the intermodal transportation by splitting up the operational chain to different elements with two main components: the major transport and pre/end haulage. Furthermore, the major transportation leg can be divided to two distinctive network-like elements: links and nodes. This is presumable one of the most common ways to figure out the real processes (see e.g. Woxenius 1998). Occasionally, however, the use of ITUs is not an indispensable condition for intermodal transportation (Aastrup 2003). Besides, and considering the practical side of IM, many of the actors utilise the traction service as provided by the focal firm either for transporting containers, *or* semitrailers, *but not both of them*. For this reason container transportation is often discussed separately (see e.g. Bask *et al.* 2001).¹

1) For a review on intermodal transportation industry in Europe see e.g. Woxenius (1994, 1998), Frybourg and Nijkamp (1998), or Bukold (1996), in the U.S. Muller (1995), in Finland MINTC (1998); for a description of the service package offered by VR Cargo both in domestic and international service see www.vr.fi

According to the Commission of the European Union (see e.g. European Commission 1998), intermodalism is basically a *transport system* in which at least two different modes are used in an *integrated manner*. Practically often *door-to-door-conditions* are required. This explanation is consistent with common definitions in transportation industry, as it is quite typical to conceptualise transportation function as a system (Bukold 1993, Woxenius 1998; see also subchapter 2.4.). Some scholars have adopted a system-based definition even its plural form describing intermodalism as *systems* (e.g. Adjadjihoue 1995 or Aastrup 2003).

The definition approved by the Commission extends the scope of interest. According to it, intermodalism is a system of sequential activities or operations such like transportation, and terminal handling. It refers to a *chain* or *process*, thus reflecting slightly the ideology of supply chain management, which in this sense means an integrative philosophy to manage the total flow of goods, the transportation and other logistical functions from vendors to customers and end-users. Hence, a challenge is to reveal the trade-offs between the functional elements of a logistical system, e.g. between transportation and the inventory system.

Integrated transport system as a term addresses more *actors* than actual shipments in successive transportation of goods (Woxenius, 1998) or physical base of transportation. The intermodal chain is parallel to the concept of a system: focal points are the actors, the events, and activities associated with the common characteristics for intermodalism freight (e.g. use of ITUs). In both of these concepts the process of activities and network are essential components generated from SCM- thinking.

A *functional-based* definition with layers as employed by Bukold (as explained by Gröhn 1998, 378) describes an intermodal transportation system with three different components having an impact on organisation functions as well:

- organisational functions for the entire transport chain,
- organisational functions for individual chain links, and
- operation-technical functions for individual chain links.

Despite of the use of these operational or technical definitions some other factors have to be included in the framework. Lloyd's of London - as expressed by D'Este (1996) - describes the intermodal system with *five layers* representing five *different functions*. The most important layers are ranked first as follows:

- the physical base of transport operators and movements,
- associated commercial services (and their direct costs),
- management control of the system (measured in terms of management time and effort),
- adjunct to management system (flow of information including the documentation), and
- liability for damages and delay (measured in terms of relative risk).

Summing up the parts of the five-layer model, it can be noted that intermodalism is a system of many activities, and hence, approaches: to the physical base - transportation

defined by technical means - legal, commercial and managerial aspects and dimensions should be added in order to create a more comprehensive view of the phenomenon. Despite of these emerging views and multiple layers in the definitions, operational issues are the still core elements in the explanations. However, one of the obstacles for further research could be that degree of complexity will be significantly increased when additional layers are presented. Consequently, this reduces the interest to use simple models or a single-mode based approach. Often the concepts intermodalism and intermodal freight are used interchangeably together with abbreviation IM –chains, though with the latter term more attention is paid on operational aspects in intermodal industry.

As regards *multimodal transportation* as a concept, some differences to intermodalism exist, though many practitioners use these words - in a similar way as the term *combined transport* – interchangeably. Bukold (1993) for example does not distinguish between intermodalism, multimodalism, or combined transport as concepts. In his view combined transport (CT) has two distinctive scopes: a narrow and a broad one. In the narrow scope the CT is a two-modal transportation arrangement. In the broadest sense, however, CT as a term is parallel to multimodal definition. The broader form of CT is characterised by the following four features: integrated process of transport, two or more transportation modes, one load unit, and organised by a Multimodal Transport Operator (MTO). Later, though, Bukold in a similar way as Woxenius (1998) systematically replaces the term CT with the intermodal concept, which seems to be a recent trend when intermodalism is conceptualised (e.g. MINTC 1998 actually defined CT when explaining the concept intermodalism).

The multimodal transportation in this context means *the use of ITUs with at least two modes but not in such an integrative, strategically planned and controlled manner*. In relation to layers it can be noted that the lack of integrative management or control is evident; it could be suggested that the degree of control is significantly lower. The UN Convention (as presented by Ojala 1995) explains multimodalism with similar issues as noted above added, however, with one supplementary feature: there should be one contract in multimodal transportation, excluding pick-up and delivery haulage, though. Furthermore, this refers to the use of one document issued by one Multimodal Transport Operator (MTO).

The *legal aspects* of intermodal transportation, especially the liabilities, as well as the contracts and documents, are problematic in multimodal/intermodal solutions. Some independent organisations have launched they own documents (e.g. COMBICONBILL by BIMCO, FBL by FIATA), and the International Chamber of Commerce (ICC) has created ICC Rules for multimodal transportation and documentation. The most typical form of document in a general sense is Multimodal Transport Document (MTD), which is mostly applicable in combined transportation solutions. Under the circumstances, in which no uniform, world wide legislation and jurisdiction for multimodal solutions exists, a carrier as MTO can quite *a freely and independently define the terms and conditions for haulage*.¹

1) Compare to the levels as proposed by D'Este (1996). Considering legal matters, the role of MTO is defined in a manner parallel to the suggestions by I.C.C

With regard to liabilities, some international conventions for single modes (CMR/CIM) have instructions for multimodal purposes as well. *The liabilities as obligations affect the roles of the carriers as well.* Besides, critical for intermodalism is not just the content and form of documents, but how they are interpreted, what is their role and - what is more important - what are the implications for practical procedures between the main partners: shippers, carriers, and receivers. On the other hand *documentation often implies contractual ties* between the parties involved. In general, it seems that there is no single operator or actor who could take care of the managerial or governance functions in intermodal systems. Because of this Gröhn (1998) has proposed even a use of a *virtual operator* in intermodal analysis or Tuimala and Lukka (1999) have analysed *integrators* in IM networks.¹ In practice, however, the range of TPLs (forwarders, Nonvessel Operating Common Carriers, mega-carriers) give service that consolidates the transported goods, plans different routes and modes, and has *several other integrator-alike functions.*²

Multimodal transportation represents some of the integrated unimodal systems of today e.g. container transportation with different modes based on door-to-door conditions. Though door-to-door terms are typical in real intermodal solutions (compare to the definition by Woxenius 1998), the use of these terms is highly dependent on the strategic outlines carriers/forwarders have set: e.g. Transfennica favours the use of terminal-terminal conditions, whereas Finnlines and Containerships more often prefer the use of door-to-door- conditions with the clients. Occasionally, multimodal systems are created to transcend geographical hindrances (e.g. the Baltic Sea) and the spatial obstacles the transportation chain might have; this quite a reactive response for using several modes. Nevertheless, if genuine intermodalism is evident, the shippers and operators should work more proactively (for a more detailed discussion on proactive and reactive intermodal solutions as well as the partnerships among service providers see Tuimala 2000 or Ojala 1995). Furthermore, *combined transportation (CT)* is a two-modal transportation arrangement with unit loads to be freighted; most frequently, however, this arrangement is a *combination of rail/road freight facilities*. It seems that intermodal transport is becoming a *generic term* replacing CT or multimodal words; this means that under many circumstances, in which a transportation service is constructed for a single mode basis, the word intermodal is used instead of combined transport, particularly if containers or other types of ITUs are used. This is true particularly when service providers are expanding their business: a service package includes a combination of several modes in a transportation chain.

1) Virtual as an adjective denotes to situation in which something is *'having an essence or effect but not the appearance or form'* (Collins 1992). Regarding business economics the term virtual has a range of adjunct meanings like *virtual corporation*, which is constructed for a specific market opportunity (Andersson *et al.* 1997). Sometimes the concept virtual organisation even denotes a network organisation, in which the relationships are under consideration. In this study *virtual processes* are explained (see e.g. figure 1.2).

2) As an example the following definition for short sea shipping is applicable in this situation portraying the recent trend among operators to enlarge the traditional, single mode based business: *'Short sea is intermodal transport of intra European cargo on a door-to-door basis via European coastal waters. The transport via sea constitutes a considerable part of the total door-to-door transport chain. The goods are mainly shipped in containers and trailers and in this form short sea is an alternative to road transport'* (van't Verlaat 1998).

The entire compilation is marketed as intermodal transport or service. The practical issue - the use of door-to-door conditions e.g. in container service - requires the use of several modes. Theoretically, however, these service agreements are more CT systems than genuine intermodal freight systems.

The discussion clearly indicates that actually there is a *continuum of related terms* - of possible and applicable definitions for intermodalism, CT as a starting point defining the simplest form of intermodal solutions, continuing with multimodalism and ending in intermodalism, which at extreme is presented as a multi-layered conceptual system. In this study no strict boundary is made between intermodal and multimodal solutions due to difficulties in finding real or active solutions (compare to the findings of Ojala 1995, Tuimala and Lukka 1999, Nikkanen and Lukka 1999, Woxenius 1998, Bukold 1996). The concept intermodalism is favoured due to its generic nature. It seems that different transportation solutions with at least two modes and one ITU are classified as intermodalism today.

In this study intermodalism is defined with the following characteristics (compare to suggestions by Lloyds/D'Este 1996, Bukold 1996, Gröhn 1998, Woxenius 1998, Tuimala and Lukka 1999, Tuimala 2000, Nikkanen and Lukka 1999): *a form of interorganisational behaviour characterised by the physical movement of unitised goods with ITUs, using more than one mode as performed by a network of operators.* Accordingly, intermodalism is more or less a network phenomenon tied up with various relationships. Furthermore, intermodalism is here defined not as just a phenomenon caused by the production system, but from a particular analytical angle as well: intermodalism is considered to be interorganisational behaviour represented by the inherent (social) processes and structures as well (see also figure 1.2).

Moreover, intermodalism is neither a combination of several modes nor a constellation of different layers (compare to D'Este 1996), but a network-like construct. There is no real and genuine intermodalism without *active (proactive, interactive) participation of all the parties concerned (e.g. ordinary facilitators but also port operators, even trade unions) in the nets.* For this reason both the IMP-based network theory as a representative of network thinking and the network-like, more managerial supply chain approach will be analysed in order to highlight the interfaces and differences between the models.

Critical for the study is should undeniable, whether we should use the term (and content) intermodality or *interoperability*, or both of them. Frybourg and Nijkamp (1998) reveal three main dimensions, when the transnational IM networks are considered: *interoperability* aimed at improving the technical compatibility between networks (technical matters), *interconnectivity* aimed at improving the accessibility at all geographical levels (spatial aspects included) and *intermodality* aiming at improving the customer (or user) value at different modes.

Intermodality as a practice requires a higher degree of interoperability. However, understanding the logic of interorganisational behaviour can be a tool for developing the interoperability in general; particularly when the role of *all* the operators is stressed. Besides, further analysis requires the inclusion of spatial considerations (interconnectivity) because there are *no networks without spatial dimensions.*

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2.3. Modelling of the Intermodal Transportation System

In classical IM analysis the *question of causality* is widely discussed (see e.g. Adjadjihoue 1995). However, Lalonde and Powers (1993) have predicted that in the 21st century the analytic approach by modelling, which was typical for studies in the 1990's, will be replaced by *interorganisational problem solving*. This means that the still leading activity or network- based technology is becoming more information oriented both on inter- and intraorganisational level. In intraorganisational behaviour, cross-functional teams will be more common, having an impact on interorganisational behaviour as well. Moreover, there is need to *modify* conventional modelling as well.

The most typical way to conceptualise IM- systems is to *generalise a conventional unimodal model* with a sequence of movements and operations including transshipments, between the modes at the nodes. From theoretical point of view, the result as a sequential system can be depicted by a comprehensive network/chain model with a strong technical emphasis. According to D'Este (1996) the positive side of this research tradition is that a lot of useful information and theoretical thinking is gathered from the spatial dimensions of the intermodal system (and costs associated with physical transfer).

Undoubtedly, there is a lot of current information on linehaul and terminal handling procedures in IM chains. According to D'Este (1996) problems at the intermodal interfaces, the shipper-carrier- relationship, documentation, and transfer of information are the most important issues in the field of intermodalism. Many of the costs, delays and problems occur typically at interfaces between the modes; e.g. stuffing, stripping, dunnage, hoisting, and terminal handling are time consuming and thus relatively expensive.

The current approach also concentrates on the economics of freight markets by explaining macroeconomic level interactivities. Nevertheless, lack of relevant information regarding the importance of service factors is evident. There is strong demand to explain the dynamics of individual decision making. Conventionally, many attempts have been made to explain the phenomenon in terms of linear utility measures. Thus, the goal is rather to minimise the disutility than to maximise the utility by reducing the operational costs (e.g. elapsed time, social costs, energy consumption). To the conventional approaches belong the measuring of system performance assessed pragmatically as total system cost, which means utilisation of the total cost approach (compare to Woxenius 1998, also Bukold 1996). D'Este (1996) concentrates also on *events* in transportation chains (passage of consignments), when constructing an abstract network model.

Accordingly, researchers could achieve scientific robustness by avoiding overemphasises of linehaul and technology concerns in analysis. Furthermore, more attention should be paid on the role of services and transitions in general. When constructing a model a minimal set of features (later: attributes) can to be listed; a simple working definition is a set of the following characteristics:

{ Product, Location, Unit, Mode, Status }

The basic dimensions of a simple logistical system are time, cost and risk, subject to activities which take time, cost money, and involve risk. In addition, each activity has a set of performance measures:

cost: monetary cost, spatial distance defined in terms of cost distance (for a more detailed explanation of the concept see subchapter 4.3.2),
 time: duration, delays, spatial distance expressed as time distance
 risk: quality service factors

The outcome of activities will be transition of one logistical state to another; in this context event is a triplet of three components: input states, output states and activity. Accordingly, major intermodal processes can be represented as events.

According to D'Este (1996) IM can be represented as *inherent* components of the model; e.g. nodes as terms are connected to some specific locations or points. In general, more attention should paid on events, as most of the problems occur in the interfaces of an intermodal transportation system (e.g. in ports, marshalling yards, container depots, terminals, and border stations). In IMP based network explanation, some scholars (e.g. Hedaa and Törnroos 1998, Halinen 1994) have also suggested the use of term event instead of act or activity (see subchapter 3.3.1 for more discussion). However, it seems that several researchers do not distinguish between event and activity as terms (see e.g. Frybourg and Nijkamp 1998).

Besides D'Este (1996), also New and Payne (1995) have assessed the problem of causality in order to introduce some new ideas for logistical discussion. Exposing three different states (paradigms according to them) they explain one which is supposed to be the most appropriate one in the field of logistics. A graphical presentation of the three basic paradigms realising the causal links is depicted as follows (figure 2.1; New and Payne 1995,64,65)

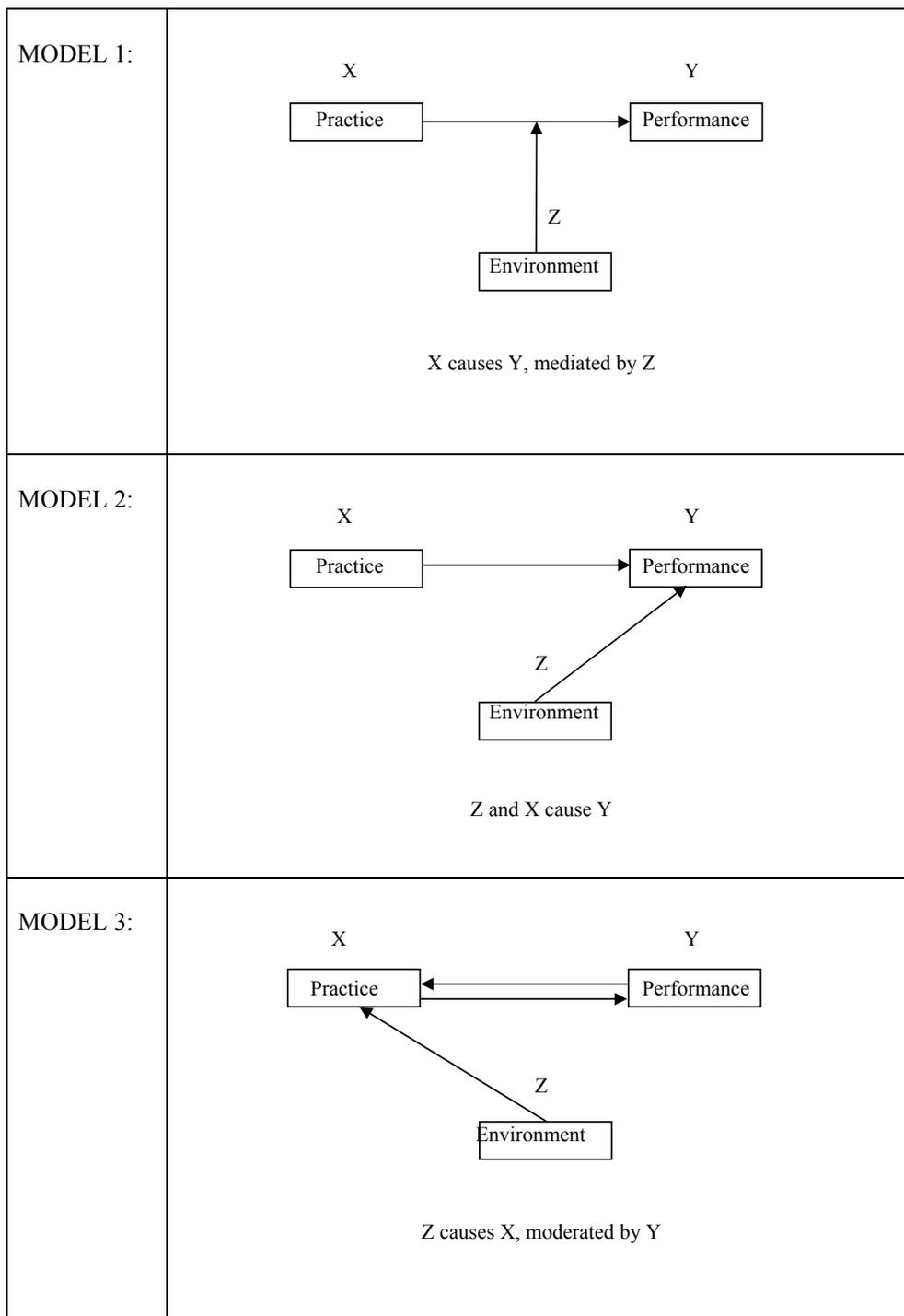


Figure 2.1 Causality in Logistics Research

The concepts have the following meaning: environment is a context in which business operates, performance is the outcome (e.g. volume of sales, profitability etc.), and practice is all the things which organisation may do. In the view of New and Payne (1995), logistics systems are generated from environment: its geographic, social, and economic conditions. There will be an industrial evolution and unsuccessful practices will be eliminated. As a consequence, some *leading disciplines are translated to other domains* - analogies from other domains can be (and are) quite a common in the field of logistics.

New and Payne (1995) state that the most adequate paradigm (model 3), is both a feasible and a valid approach for the research not just in logistics but in operations management in general. On the other hand, under the network approach, the question of causality is problematic, since it is assumed that the actor-reactor- scheme with a cause-consequence- reasoning (e.g. the environment affects practice directly) is probably not valid.

Moreover, despite of the fact that the environment has such a prominent role in the models, it is still unclear what is meant by this concept. Also, what is the relevance of the system-based approach in general in discussing the intermodalism (compare to Woxenius 1998)? Furthermore, what are the other options for examining the outer reality? In the next subchapter one of the major targets is to bridge the gap between conventional analysis, based on the idea of system/s; some new proposals are presented as well.

2.4. Conceptualising the Outer Reality for IFT

The previous chapter indicated that intermodal research requires a description of the outer reality. Thus, the theoretical discussion requires a description of the *concepts of the environment* in order to create a frame for forces that can affect the phenomenon under analysis. Furthermore, the question of how the concepts differ under different approaches is important. In this subchapter some concepts of the outer reality are presented; the terms *system, context and embeddedness* are examined; also the concept of environment concept is compared to the other suggestions. In IFT analysis the systems context has been mostly employed (see e.g. Woxenius 1998, Bukold 1996). As such, intermodalism is perceived to be an *outcome of the system's performance* and the characteristics this system can have, e.g. its physical or infrastructural nature. Environment is one of the most often used single terms for describing the external circumstances, added with some details as macro- or micro-environment or even the meso-environment. Often environment refers simple to '*what is outside*' (Salmi 1995, 43 footnote). In contrast to environment, embeddedness can be an alternative conceptualisation for examining the outer surroundings; this conceptualisation is also *explicitly* discussed in the IMP -based network approach. Hence, it is important is to explain how *a single actor is embedded in the network of other operators*. Moreover, theoretical examination of the embeddedness makes it easier for the researcher to discuss the *question of engagement* as well.

System

Typical for intermodal research is to create a framework within a *systems context* (see e.g. Woxenius 1998, Adadjihoue 1995, Bukold 1996), though network and system as concepts have many parallels: the same kind of matters are underlined in both as relationships, structures, and interdependencies (compare to the discussion of the logistical systems in subchapter 2.3). However, more typical for systems is a *hierarchical structure*: a larger entity comprises a composition of sub-systems. In addition, typical for open systems is that they tend to move to greater complexity and differentiation of their external outputs (Ballantyne 1998, 274). A high degree of complexity in IFT is one of the major reasons to utilise the system concept. The systems theory has been one of the sources for network analysis as well, although the Nordic tradition seems to have other points of departure for analysis: more attention is paid to one firm's position instead of describing the components of the entire system (compare to the suggestion by Woxenius 1998, referring to structures: system \Rightarrow transportation system \Rightarrow intermodal transportation system: IFT is created with the help of the system). In broader sense cybernetics and systems thinking can aid to control and analyses the network (Lumsden *et al.* 1998, 163,164).

An open system creates higher level of complexity within organisational boundaries; a tendency which has been identified by network scholars, as well (Dubois 1998). As regards business networks, the difference to the term system is evident; with a net there are actions and activities among actors involved favouring convergence (instead of divergence), thus aiming to reduce the complexity and achieve more stability, which is easier to handle and control. In this study system as a term is occasionally used as a term to avoid tautology.

As regards logistics systems, an *operator-based depiction* is presented by Lumsden *et al.* (1998): they stress the *roles of shippers and forwarders* in a system. For them the initial point for the evaluation is the interfaces (node-links) including two kinds of perspectives for strategies: de-integration and integration. Lumsden *et al.* (1998) address the availability of appropriate information when managing and controlling complex systems. From the forwarder's point of view an overcapacity situation is effective in order to reduce the risks. In principle forwarders dislike this kind of a system as simplicity of system is rather required. Lumsden *et al.* (1998, 170) also argue that it can be difficult to get information because in freight transportation a limited number of intermediaries – like agents or forwarders - make the primary decisions.

Context

One of the most important findings in network studies is the suggestion that nearly all of the phenomena are *context-bound* (see e.g. Tikkanen 1997). The contextual perspective is one of the constructs in the network tenet: when e.g. Alajoutsijärvi *et al.* (1998, 15) have utilised the *contextual dimensions* the context refers to '*area of connectedness or embeddedness emphasising the role of time*'. It can be supposed that in this constellation also *space* could be addressed because of the conceptual links between space and time (see Castells 1996 for more discussion; also chapter 5 in this study). Snehota (1990,147) defines the term more concisely; he claims a context is '*a pattern of interactions between a set of actors*'; that is '*a cluster of actors in which*

some co-action (...) among other takes place'. Snehota's context is structured and organised but initially made up of activities. This is parallel to the definition of the network structure although it emphasises more the 'what is inside' aspect. More typical is to depict the 'outer' dimension when context is defined (e.g. Tikkanen 1997).

Contextual analysis can be close to network analysis. In contextual analysis network-like definitions are used such like participants, the verbal and non-verbal communication and the objects for interaction, or settings. The setting has three elements: time (past, present, and future), space (e.g. geographical, social, industrial, technological, even political) physical environment (Alajoutsijärvi *et al.* 1998). Hence, *spatio-temporal aspects* are strongly underlined as well as the societal processes between the participants. Communication is a core activity in interaction processes. In accordance with Alajoutsijärvi *et al.* (1998), and considering the scope of this thesis, it can be assumed that context denotes to an area of connectedness, embeddedness, structuredness, and closeness of actors.

It seems that several terms share an identical or close content like setting, context or even embeddedness (see e.g. Halinen and Törnroos 1998) or as Alajoutsijärvi and Erikson (1998,15) postulate it, the word context is '*used in a loose manner*' and contextual analysis '*is more preached than practised*'. In this study the context can be interpreted under two different contents: the *transportation of unitised goods* (the IFT) is a practical, visible, and concrete context expressing the real processes. However, and because of the objective and contextual aspects of the study, it is more important to understand that the result is a *snapshot of the phenomenon* affected by a variety of network features; hence, a *stilleben* or a portrayal of the factors, and actors, and reactors *in time and space*, because of the fact that the context is not a static determinant but in continuous change. Inevitably, the depth of contextual analysis depends on the theoretical view that is applied in the study: under managerial explanations there is not plenty of room to discuss this phenomenon.

Despite of the fact that context is a bit obscure and inconsistent as a term, it is valuable for analysis. It helps the researcher understand that there are limitations in the study. More particularly, context as an idea puts the findings to a specific *momentum and place*; all the variations of interorganisational behaviour are thus context-bound. The term as a conceptualisation is an admission from the scientists' side to accept the *dynamics of network performance* and the *instability*: it is very difficult to form an overall picture of the studied phenomena because of the continuous evolutionary development in all the organisms (see e.g. Tikkanen 1997). Hence, contextual analysis can be a *more organic way* to create a picture of the phenomena to be studied.

In the sense described above, the network approach is not so robust in explanations as the research work conducted under the nomothetic-deductive research tradition. This is true regardless of the fact that we are coping with a structural bonded network. As stated, the environment is somehow connected to contextual analysis, which is part of the context (compare to the settings by Alajoutsijärvi *et al.* 1998 above). Besides, by defining a context a researcher aims to identify the environment more comprehensively. Indeed, Pettigrew (1998, 340) gives a dualistic view regarding the context: the *outer context* includes the economic, social, competitive and sectoral environment in which firm are located. *Inner context* refers to the inner side –according to Pettigrew mosaic -

of the firm: the structural and political environment which - in consort with the outer context - shapes features of the process.

Despite of the fact that context as a term has a strong analytical connotation, it gives *guidance for strategical purposes* as well. This means that by framing a context an actor actually defines its position in a 'platform' or an 'arena' in which the essential strategical actions should take place. As Håkanson and Snehota (1997,147) put it, '*the effectiveness* (like effectiveness for strategical outlines) *is managed through framing the context than designing and planning the future pattern of activities*' (the comment in parenthesis by the present author). This implies that the *context*, in which a single actor is *positioned*, is a *fundamental construct* when the actors are *drafting future activities and courses of action*.

In contrast, some scholars claim that the supply chain based analysis is more powerful in explaining how to *control the activities on strategical level*. In the world of practitioners supply chain thinking has gained success due to its ability to create solutions for more co-operative, business oriented arrangements, which the operators are looking for. As Ballantyne (1998) points out '*there is much to be gained* (for researchers representing the network tenet) *from an understanding of the logistics discipline of supply chain management, based as it is on systems-wide concepts that link the focal organisation with the end consumer market on the one hand and 'upstream' manufactures and suppliers on the other* (op.cit., 281; the text in parenthesis added).

The power of the network approach and the contextual analysis is that it is less managerial (see e.g. by Tikkanen 1997), and in theory equal, interactive and voluntaristic themes are more underlined. Though lacking some explanatory and analytical power, as a construct for the context network discipline is strong; as Ford *et al.* (1998, 270) claim '*the companies (...) aren't simply units in a linear supply chain, nor do they comprise one level in a (...) distribution channel*'. The statements (by Ballantyne 1998; also Ford *et al.* 1998) reveal the discrepancies there exist between managerial and strategical supply chain ideology and the more descriptive but less managerial network approach.¹

Embeddedness

In this study *embeddedness* as a term refers mainly to the *social context* or *structures* in which actors are embedded (e.g. in nets). In general, some scholars give a range of related aspects and dimensions for the concept (Halinen and Törnroos 1998), whereas some others consider mostly economic and technological ones (Ford *et al.* 1998, 264). Even hierarchial, multi-layer depictions have been proposed (e.g. Törnroos 1997, 627,628).

1) With respect to context, Alajoutsijärvi and Erikson (1998) claim that there should not be any *a priori* limits to the scope and level of what counts as the relevant context. Furthermore, they argue that '*if not limited by a theoretical perspective or a model, relevance is an empirical matter*'(ibid. 19). In this study it was decided that the findings on every stage should not limit the theoretical discussion and subsequent analysis after intermediate synthesis.

The suggestion of Törnroos (1997) distinguishes five different levels for assessing embeddedness: focal actors, network core, network context, outer limits, and the outer environment. The basic idea is that there is a core of the simplest and tightest bonded network (the focal actors) circled by the loosest bonded one (the outer environment). Moreover, Halinen and Törnroos (1998) discuss *temporal, technological, spatial, social, political and market* elements when describing the contents of the embeddedness.

Embeddedness is predominantly influenced by the position of the actors in social networks of relationships. Gulati (1998, 295) has defined the elements of social context more accurately by using a simple classification *to structural, cognitive, institutional, and cultural elements*. A definition with social orientation is suggested by Granovetter (1973, 33), when he claims that embeddedness can be characterised as follows: *'economic action and outcomes, like all social action and outcomes, are affected by actors' dyadic (pairwise) relations and by the structure of the overall network of relations*. With respect to social aspects and structures in general, Gulati (1998) stresses the importance of *information* in social behaviour.

As a concept, embeddedness as a concept is more or less a reflection of the *structural aspects of the network highly influenced by social elements and the relationships created to maintain these*. If position can be a tool for creating and improving strategies, embeddedness influences the perceptions of the context an individual actor might have. With embeddedness a single actor, for instance a person, can assess their role and position in a web of actors.

Moreover, embeddedness can be an *expression of involvement*. Indeed, economic geographers tend to define embeddedness in that way, that it refers *to involvement in local relations* (Oinas 1998,52) though this is not an uniform and settled view; some researchers comprise non-local aspects in the term. In general *spatiality* is one of the major ingredients of the term (Oinas 1998). The linking tie between social relationships and the geographical explanation is simple: most of the contacts, specially the informal ones, are with those actors who are close to the focal actor/firm; in other words: *most interaction is between participants having close organisational proximity*, which is often a reflection of geographical/spatial closeness. Generally, embeddedness can even be interpreted as involvement in the entire network (see e.g. Oinas 1998) and not just in one particular subentity.

When two generic terms, context and embeddedness, are compared there seems to be a slight difference. In this thesis embeddedness, which can be close the concepts of position, role and identity as well, is a *reflection of the all perceptions* the individual actors have of the surrounding reality, affected by various nets and the inherent social structures, in which they perform and which have impact on the strategical and operational activities. *The impact of the network is channelled through the relationships*. The context comprises several other aspects as well, including its contribution to analytical matters. In addition, embeddedness depicts the range of networks or nets - other than business networks - such as personal nets; a detail that has been also identified by Törnroos (1997).

Considering the interplay between environment and other terms of the outer surroundings, it was already mentioned above, that environment is a vague term in

managerial models for depicting the outer forces, which an actor can not influence. Besides, the term interaction environment can refer to the ‘*external context*’ (Alajoutsijärvi and Erikson 1998, 12). For network research the concept environment is a bit complicated because there exist an infinite number of relationships and actors in an entire network. Theoretically, it is somewhat difficult to set boundaries to this entity. On the other hand, every relationship in some specified entity affects the others - directly or indirectly. It would probably be necessary to identify the forces in order to clarify what is meant by environment: e.g. some events caused by other actors can be drastical for a focal firm (see subchapter 3.3.1.). Accordingly, the environment should not be an anonymous, unidentified power or uncovered force as suggested in SCM based thinking, but more a verified range of actors, for which the focal actors have to create an appropriate relationship. Though environment is used in interaction models, it refers more to the surrounding reality in a more specified manner than in managerial analysis, in which faceless forces outside a focal firm are described.

As underlined, the characteristics of the IM network structure provide the context for the operators’ performance and thus for the analysis as well. However, there should not be too much analytical limits made *ex ante* because of the limited empirical capabilities to treat or conceptualise the outer surroundings. However, in the managerial approach, system design is of major interest, as it has less analytical means for explaining the behaviour than the network view, in which the behaviour of actors in the outer reality is one of the major objectives. Also, by addressing how an actor is embedded in the outer surroundings, the value of the social structures is handled in a more specific manner. To limit the scope of interest with the terms of the outer surroundings, the researcher aims at being able to discuss the outer surroundings in a more detailed manner; on the other hand when coping with a limited number of relationships, context-bound limitations is made. Moreover, the use of *ceteris paribus*- assumptions is also applied in managerial partnering/alliance studies, in which there is also less interest for contextual analysis.

2.5. Nets vs. Networks: Identification of Subentities of Intermodal Network Structure

In previous chapters the network was discussed from structural point of view: intermodal network *per se* was mainly in focus. There are, however, as depicted in figure 1.1, actually different levels for examining the network. This means that *a limited and specified set of actors can and should be examined*. As such, nets are smaller units of the entire network and they ‘*provide a lower level of analysis*’, as Easton (1992,18) puts it.

Nets are discussed in this subchapter more accurately. They are essential for understanding the logic of networks. The network as a structural entity from the supplier to the end-user is often quite a vague in nature. Most of the carriers and other operators have only limited knowledge of the final users of the transportation services. They work together with counterparts in some smaller unit, with whom they have close organisational proximity. The perceived distance can be reduced with intense interaction.

Inevitably, it is an extremely difficult task to create even a clear picture of the network, and subsequently to model network structure due to the heterogeneity of the network actors and the infinite number of relationships. Besides, it is even questionable to what extent the modelling (expressing e.g. probable causal links) is even relevant, because of the organic nature a network generally has (compare to discussion in previous subchapters 2.3 and 2.4). The network should not be a vague term for an indistinct block of operators working together.

In order to model the network structure, an appropriate classification method is required. As a unified entity a network can be split up to sub-categories (smaller units) using appropriate parameters or perceptions in the classification. In the subdivision process to smaller nets, criteria like *geographical*, *technological*, *functional*, (as often in SCM) or *perceptual* (as in the network approach) can be valuable. It can be postulated that a *network* is actually *a constellation of various, partly overlapping nets including tying actor bonds, which strengthen the relationships and which the roles/positions are based on*. In pragmatic analysis *a net* is actually often under consideration, not a network. Occasionally, though, these words – net and network – are used as synonyms.

Triads as Nets

The significance of *webs with three-members* can be expressed as follows: the triad is the *smallest unit of network in which both direct and indirect relationships* are typical; a dyadic relationship contains just direct relationships. When triads are classified in IFT, the following constructs can be identified:

- the *involvement of the third actor* (practically e.g. forwarder, carrier, TPL provider) *is gradually increased in a dyad*; this evolution progresses over time, going through different stages, and can finally lead to strong integration. In this case, a basic transaction – or a longer-term commitment - between the actors in the dyad is a basis for the establishment of the triadic relationship (model 1)
- *triad between equals*: three heterogeneous partners with different, though complementing tasks intending to work in a more co-operative way (model 2)
- *triad as a sequential system*; third party as a neutral intermediary (model 3)

The foundations above are presented graphically in Figure 2.2.

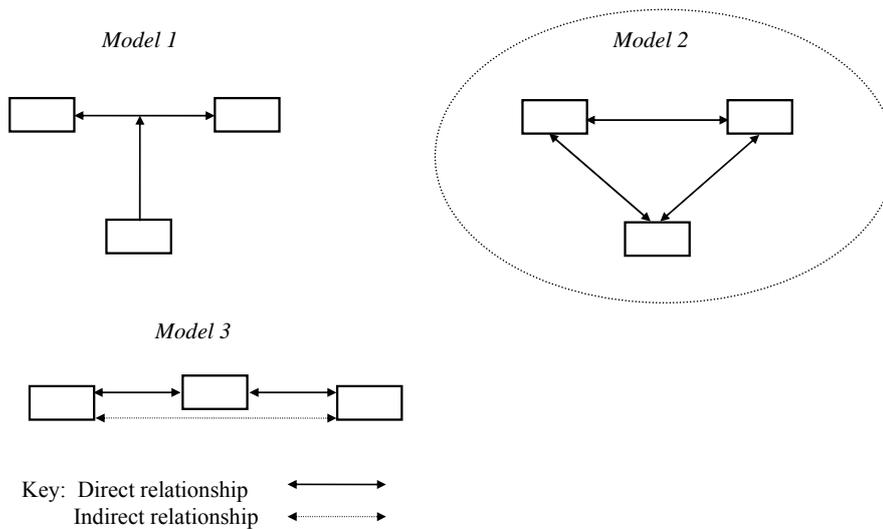


Figure 2.2 Three Basic Forms of Triads

Havila (1996) has presented two generic triads, serial and unitary ones. The basic constellation, however, is not applicable in this study. Havila has explored a typical three-actor case within a channel, which means that the third member - the intermediary- is a mediator or connector, or a central actor (Järvinen and Lehtinen 1997). The serial triad (model 3) is an entity in which the core role of the intermediating actor is to mediate (ibid. 36). Respectively, in unitary triads the core role of this intermediary is unique and involves specific tasks. Model 2 represents a unitary model, which can be serial under some circumstances, however. If the two links (relationships) from the intermediating actor to the other two actors are strong and at the same time the link between the other two actors is weak, a serial triad is evolved. The classification with three parties is parallel to explanations generated by some other scholars too (e.g. Gadde and Håkanson 1992).

In this study, however, none of the actors can be defined as a central actor dominating the performance, though recently e.g. integrators have been more active in expanding business in IFT. Besides, *a rigid SCM model with downstream and upstream activities explains implicitly serial triads, while the network view also considers unitary ones.* Hence, the network view enables the researcher to describe the role of all the actors in a more sensitive way, also in triadic relationships in contrast to SCM-based thinking, which is more unbending and rigid in this case. Despite the fact that a forwarder is often a third member in a triad, it can be also involved in a net (inside a focal net) or in a network of operators.

In practice, the third party can be either an intermediary, working on behalf of the shipper or receiver, an integrator, or some other service provider. In this sense, *model 1 is often the most appropriate approach in analysing triadic relationships*, because the

question of the role of the integrator has caused plenty of theoretical and practical debate. Indeed, it can even be postulated, that intermodal transportation chains are created through the co-ordination created by the integrators, whether these organisations are freight forwarders, NVOCCs, or MTOs. Parallel to model 1, the following typology represents a classification by Herz *et al.* (2001). They base the discussion on the use of two different variables, when *explaining the different roles a TPL as a chain integrator can embrace* (Gröhn 1998, Tuimala 2000, Bask 1998, Bask *et al.* 2001, Andersson 1997, Berglund 1997, Herz 1993).

		Ability of customer adaptation		
		Low	Medium	High
General ability of problem solving	High	Service developer		TPL Customer developer
	Medium			
	Low	Standard service		Customer Adaptor

Figure 2.3 A Typology of the Types of TPLs within Triads

A standard service provider offers simple standardised services, whereas a service developer offers advanced value added services for each customer according to their specific demands. The customer adaptor takes over the customers' existing activities and thus improving the efficiency. The customer developer tries to offers new and innovative services. The most common way of classifying TPL providers is based on individual customer alliances, which can also be interpreted as concerning the degree of adaptation to the customers. Moreover, the classification explains the degree of and willingness for the adaptation. With respect to roles, it can be suggested that under some circumstances also *a railcarrier could take a role of an integrator*. This proposal is discussed more in the empirical part of the study. Since the forwarders have such a crucial role in IM business, there are actually *numerous triads in IFT*. Besides, an operator firm can have a different role in a triad that in an IM network.

A triad affects also the types of relationships. Within a triad the focal firm can have direct business relationships with its counterparts. With supportive actors the focal firm has mainly direct relationships but also *indirect* ones. With the others the relation lies on indirect impacts. As a consequence, three different links exist. A *business relationship links actors, activities, and resources* within a *supportive relationship actors and activities are linked* and an *infrastructural relationship links only the actors*, but not resources or activities. In addition, it is important to note that *actor bonds combine all the actors in a network structure* (compare to chapter 3.3.5).

Local Areas as Nets

Some researchers use the term *local* network for the subentities of the networks and the strong *geographical/regional connotation* they can carry for *two* reasons: *first*, the different types of embeddedness in related studies, and *second* because of the strong geographical features the studies might have (Tikkanen 1997, 70 footnote). Cova *et al.* (1998, 206) even propose the use of the concept *milieu* to distinguish between *two* types of network which are conceptually identical but functionally different: the *networks of proximity* (referring to spatial but also to cultural and psychological proximity) and *transterritorial networks* (global networks). Global networks can differ from local ones for instance by the density of contacts and their informal character. The above features are typical also in the multimodal/intermodal context with its strong social and structural bonding. In this sense the local net considerations are parallel to the milieu concept.

The local net or the milieu can be seen as a refinement of the network analysis; the milieu is strictly bounded to an areal territory - as in the beginning of the present study to South-East Finland (or the golden logistical triangle as claimed by Parikka 1999, I). Cova *et al.* (1998) conclude that the milieu concept takes both non-business actors and non-business relationships into account. It should be pointed out that in the network approach basically the non-utilitarian relationships (other than business relationships) are more exhaustively included, not excluded. In a local net, however, the analysis of these other than business relationships is more intensive; within global networks the assessment of non-business actors is difficult due to the complexity of larger entities.

Geographically, a local net can be a *predefined territory* with regional boundaries. Hence, the entity defined is a fraction of the entire set of actors and relationships, but should be accepted for the sake of the analysis. Practical research work always requires some kind of clarification by means of limitations to reduce the scope of interest. A similar and much more operational term is the word *cluster*. The term cluster denotes mainly some specific industry and to infrastructural networks. Besides, the term has been used by regional associations in order to underline the extent and strength of local transportation sector, including not just the operators but the stakeholders as well. Inevitably, cluster is mainly a term utilised by *supportive actors* when describing the territory and functions of the area that is highlighted. *Much of the IM transportation discussed in this study takes place in a local net* (e.g. the eastbound container traffic through sea ports). As noted, the density and frequency of contacts can be a way to assess the spatiality of the networks of proximity and the cognitive distance measure (for more discussion see subchapter 4.3.2.) influencing also e.g. the cognitive bonds (see subchapter 3.3.5.).

Focal Nets

Besides being territorial, a focal net can be based on *attitudinal* and *cognitive* dimensions as well. This implies that, instead of using a specified method for boundary-setting, *perception of appropriate relationships* can be a key element in defining the limits for a net; e.g. Salmi (1995, 45) defines a focal net as a '*net of direct and indirect interorganisational relationships that the focal firm perceives (...)*'. Accordingly, the boundaries are identified by the focal firm. Hence, a focal net can be local, national, or international regardless of the geographical borders between different areas; for Salmi (1995) focal net *has just limited correlation with physical proximity*. In practice, the direct relationships are of main interest, although the indirect relationships have a strong effect on direct ones.

In general, a focal net is briefly a *company's or management's perception of its context* that are within its network horizon more than a freely chosen group of actors (Salmi 1995, Möller and Halinen, 1999). Besides, it can be claimed that it is also '*company's network behaviour represents the company's interpretation of the rules prevalent in the network*' (Salmi 1995, 45). Thus, the major task for the analysis is to capture those network relationships that might have relevance for a focal firm. Indeed, some researchers have utilised the focal net perspective for assessing the performance of industrial networks (e.g. Salmi 1995, Tikkanen 1997). Also setting boundaries to an entire set of relationships and web of actors can be one of the ways for researchers to *investigate both the extent and the basic structure of the net*. In this study a focal net, which is based mainly on focal firms perceptions, is under consideration.

2.6. Behavioural and Strategic Paradigms in Logistics Research

The last part of this chapter is devoted to the discussion of logistical paradigms. The purpose is to find justification for offering two distinctive views for analysing intermodalism. The prevalence of two distinctive paradigmatic explanations in modern logistics gives theoretical foundations for the analysis. It is assumed that these two proposals give the researcher different angles for explaining the themes of interorganisational behaviour, as well as the roles and positions (see Figure 2.4; adapted from Christiansen 1998, Kent and Flint 1997, Nikkanen 2003)¹.

1) The presentation of Christiansen is based on a typology explained first by Arbnor and Bjerke (1977), who classify the methods in business economics as analytical, system and actor based (translated by Tikkanen 1996a).

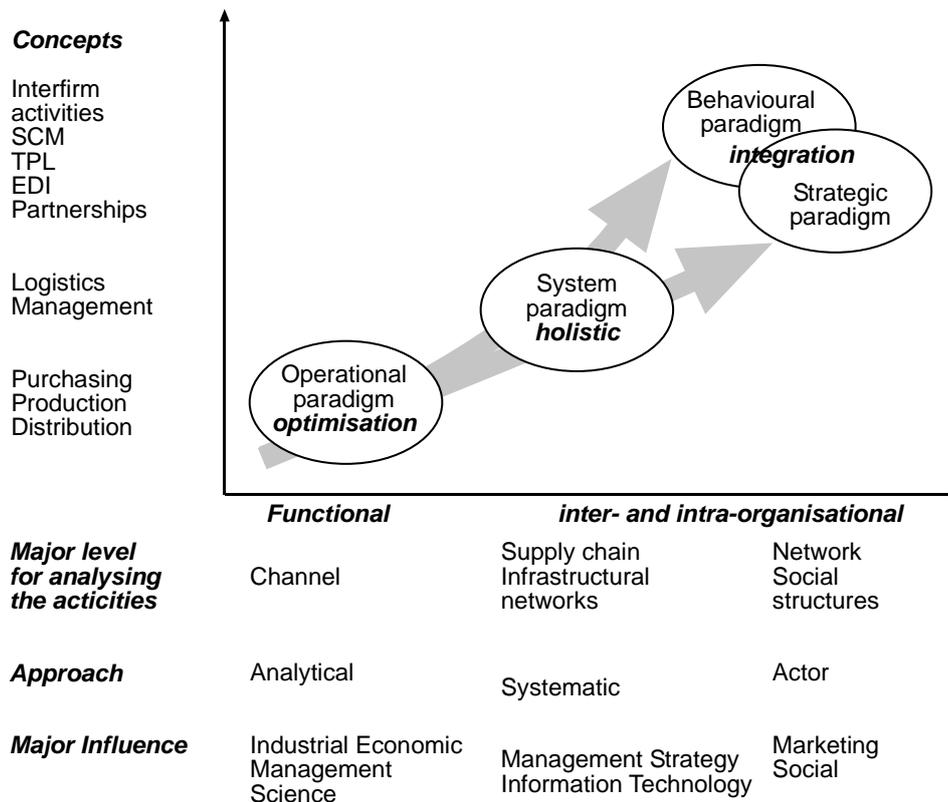


Figure 2.4 Relations between Recent Logistics Paradigms, Themes, Methodology, and Co-sciences

As to the recent paradigms – strategic and behavioural – it is suggested that the strategical view represents the strategic paradigm whereas the network view approaches the behavioural paradigm. The actor-based analysis has been typical for the postmodern era (Tikkanen 1997).

Though not necessarily, the horizontal axis is a representation of time. For Tikkanen (1997) postmodern thinking is associated with modern times and *contemporary analytical methods*. Hence, this is close to *epochal shift* as Cova (1994, 278) calls it; postmodernism as a term could be parallel to postindustrialism, which refers to the time following modern industrialisation. Several network features can be depicted as *consequences of postmodernism* e.g. *interorganisational resource dependence*, *fragmentation* of larger industrial networks into smaller co-operative *nets* (Tikkanen 1997; also Cova *et al.* 1998; compare to discussion in subchapter 2.5) characterised by efficient interaction, and the *complexity of interorganisational actor bonds*, *activity links*, and *resource ties* (Tikkanen 1996a, 593; see subchapter 3.3.5). Parallel to Kent

and Flint (1997), also Cova (1994) underlines the importance of *social behaviour and processes* when interfirm behaviour is analysed. Cova (1994) claims that some of the researchers can be even classified as representatives of sceptical postmodernism for whom reality is a pure illusion, which implies that '*everything is intertextual, not causal, or predictive*' (Cova 1994, 280); others are affirmative postmodernists, for whom the reality is constructivistic or contextualistic. Moreover, Tikkanen (1997) argues that in its extreme form postmodernism is even an anarchistic approach. For some scholars (Tikkanen 1996a, 1996b, Castells 1996, Cova 1994) postmodernism represents the *ideas* of contemporary thinking, which means e.g. that even *societies* can be regarded as *networks*.¹

In general, the question of postmodernism seems to be obscure. Scholars agree with some common features, but there are diverse explanations for the reality, which are, however, consistent with postmodern discussion and its complex nature. Because of various views, Cova (1994) calls for *pluralism* to explain the different perspectives. In a pluralistic view of the world, not just a range of applicable definitions and concepts exists, but also *interpretations*.

Regardless of the difficulties in defining the terms precisely, it is important to understand the *implications for the research work*. A researcher should be deeply conscious of the *theoretical underpinnings* of the theory that is applied (Tikkanen 1997, 83, Gummeson 1998).

1) Postindustrialism might be another way to portray the period that is currently considered. In other words postindustrialism and postmodernism could be equal terms. Moreover, postindustrialism as a phenomenon can be either a driving force for postmodernism at the organisational level *or* a consequence as well (Lowendahl and Revang 1998). Because of the fact that the social exchange theory has so much benefited the network theory, some researchers (Cova 1994, Tikkanen 1997) argue that actually *hierarchical* is a modern term referring to the past while *networking* belongs to the *postmodern era*. In general, the work by Tikkanen (1996a, 1996b, 1997 and 1998) is explicitly affected by modern sociology and some of the most common philosophers in the field, indicating the growing interest for sociological issues.

To sum up, the behavioural paradigm means that the logistics research is *enriched by the proposals, concepts and ideas created in social sciences, and more particularly in the social exchange theory* (e.g. role, position, power, embeddedness, identity, interaction). These proposals are often transferred through the modern marketing theory. The contribution of marketing theory including its strong interest in analysing networks can be significant in modern logistics thinking (see e.g. Christopher 1998 or appendix 1 for more discussion). In the strategic paradigm the *examination relies more on classical modelling* (hypothetic-deductive approach and mechanistic SR- scheme) attached by *an urge to trace practical strategic benefits*.

With respect to intermodalism, the discussion indicates that the holistic and analytical view will be gradually replaced by integrative perspective and with interorganisational themes, such as roles. Regarding the theme of the thesis, the following illustration is suggested (figure 2.5).

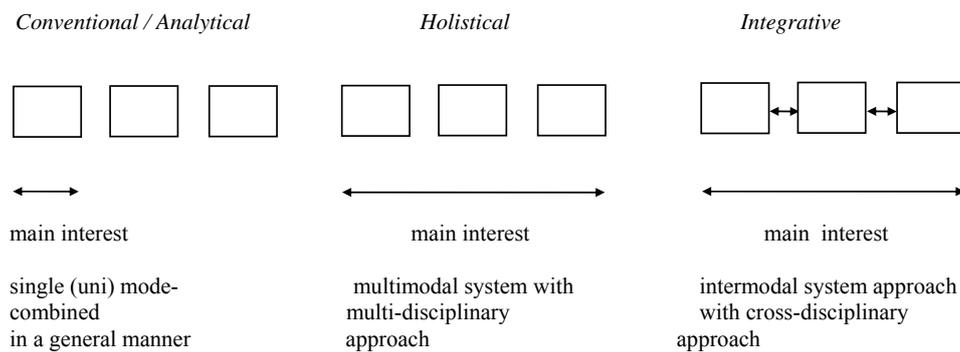


Figure 2.5 Scope of Interest in IM-Studies Reflecting Current Logistical Paradigms

Conventional analysis has been the mainstream in intermodal research. Numerous applications exist for estimating the causal links between causes and their effects on a system of nodes and links. Undeniably, these kinds of views give complementary insight for a working process. As regards transportation, the unimodal approach has been predominant. The *holistical view* gives a more comprehensive view: the content of several disciplines are coupled in order to shed light on the entities encompassed; pragmatically, a chain with different modes could generate a frame for more intensive studies. The *integrative view* underlines the cross-functional and collaborative interfirm activities. In addition, more attention is paid to single actions, acts, activities, events or interorganisational processes in order to elaborate the dynamics on different managerial levels. The outcomes, (e.g. perceived satisfaction, more intensively linked relationship, modified role behaviour), are thus more emphasised in the analysis. In general, the behavioural paradigm directs the research interest, as well.

The analysis of causalities can be difficult in the contemporary views. The interorganisational processes are organic and multidirectional, rather than causal or one-directional. In this sense, the nature of an intermodal network is less deterministic than presumed under managerial view in which e.g. the causative factors are elaborated more accurately.

Concluding Remarks

It can now be claimed that IFT is not just a question of how production systems create intermodalism (with input-processes-output logic; compare to Woxenius 1998), nor a question of how networks produce it (compare Aalstrup 2003). The notion of how an *IM network is created through the roles and positions operators might have is an important point in this study*. The roles/positions represent the behavioural aspects of the interorganisational cooperation in contrast to the kind of analysis, where the physical processes and functions of transportation are mainly in focus. This implies that the concepts embeddedness and context - instead of environment - can be valuable in further analysis despite of the fact that empirical verification is difficult.

Intermodalism in general is a network phenomenon. It includes both the inherent functions and the behavioural responses attached to these functions. Addressing the behavioural initiatives and responses means employing a different perspective when analysing the conformities of IFT. The behavioural paradigm instead of a strategic one can give some additional features for the analysis of intermodal transportation. Accordingly, *the roles/positions should be scrutinised instead of only the functions or technical processes* that the operators perform. In general, the causality is problematic, since the issues under analysis are rather interactive in nature. Under the circumstances, in which the actors are rather embedded in social structures, the identification of causative factors is very difficult.

The terms embeddedness and engagement are closely linked and have similar contents, but there exist remarkable differences as well. Engagement means that an actor joins and participates – neutrally and generally - to a network. Embeddedness depicts how an actor – like a focal firm – is *strongly* involved in the network through interlocked nets; the impact of *social structures* and nets for the network involvement has an important role. The changes (influencing e.g. roles) are channelled through relationships with a very strong interpersonal aspect.

In this research project the railcarrier is examined as a focal firm because of the fact that in a well-working IM transportation chain the railcarrier is of great importance (e.g. in rail/road combinations). Also, among stakeholders there are plenty of expectations for the railcarriers in terms of efficiency, financial performance and service level. These expectations are linked to the roles of the focal firm, as well.

Furthermore, there are identifiable nets, which are subentities of the network structure. A *focal net* as a part of the intermodal network will be analysed in the empirical part of the study (limited set of actors in the network of proximity). Theoretically, the nets can be based on the focal firm's perceptions, but they can be geographical as well. They can also be based on common technology (EDI-connections, RailTrace). An important issue for the *analysis* is the fact, that these *nets are identifiable parts of the entire network structure*. However, various nets have dim boundaries and they can be overlapping. In the supply chain theory a network consists of members, links and functions, and it is often treated as a single unity.

Finally, the *theoretical analysis* presented in this study is based on the idea of *two different paradigms* in contemporary logistics. The industrial network view is close to

the behavioural paradigm (chapter 3) in a similar way as the strategic paradigm has parallel features with the managerial view (chapter 4).

3. Industrial Network View

In this chapter various network approaches are presented with the help of the classification in order to give an overview for the theme (subchapter 3.1.). Since the network as a concept is basically a metaphor, the idea of metaphorical thinking is analysed as well (3.2.). Because IMP-based view is based on a Scandinavian tradition, examination of the major philosophical elements of the theory as well as the major concepts of the way of thinking need to be described.

One of the most important objectives in this chapter is to reveal those conceptualisations *which are not explicitly explained in the SCM- based approach* and which are needed to *understand the logic of the network view* that is applied in this thesis (e.g. identification of nets, inertia and stability vs. dynamics and events as triggers of change, bonded structures, major interorganisational processes and their outcome). Furthermore, the discussion on the roles and positions and engagement requires a discussion of the primary structural and processual elements. The selected concepts influence their description as well; e.g. roles describe the dynamical side of the network development (subchapter 3.4.), which is affected by the bonding mechanism as well (structurally bonded relationships in subchapter 3.3.5.). From analytical point of view it is of great importance to find out the major managerial levels in intermodal decision making, including how the relationships are conceived through the interaction processes (exchange, adaptation, coordination; see details in figure 3.2.). Also, an intermediate synthesis is made by combining the levels of interaction, the outcome of the interorganisational processes (subchapter 3.3.4.) and the actor bonds as outcomes (subchapter 3.3.5.).

Basically, the IMP-based theory differs from the managerial network approaches as it absorbs the idea of interaction rather than employing the mechanistic SR-scheme. Because of this, some suggestions in the theory differ from the conventional managerial explanations, e.g. the detailed description of actor bonds and the bonded structures; often inertia is caused by tight and robust bonds (chapter 3.3.5.). Moreover, the theoretical examination on roles/positions relies much on the concepts proposed in earlier parts of this chapter. Finally, the *tentative model as a theoretical synthesis* (see figure 5.3.) is partly based on the discussion made in this chapter and has thus parallels with figure 3.2.

3.1. Sphere of Network Views

The roots for network analysis can be characterised in many ways, depending on the application environment. In accordance with the original environment, different terminology and analytical approaches have been created. Typically, a distinction has been made between *concrete networks* (physical and infrastructural networks) and *abstract networks* for relationships (firms, organisations, people, knowledge elements). Also the classification between physical and non-physical is widely applied (e.g. Capineri and Kamann 1998, 36). Thus, there is both a network theory and a network

explanation or a model for different practices and purposes. Conventionally, an infrastructural network is defined as a set of connected nodes and links. A network describing a social structure consists of different types of social relationships between the parties and partners involved. A network is thus a model of a complex reality or a view with a distinctive nature (see e.g. Nikkanen and Lukka 1999 for more discussion).

The network is a *metaphor*: a network has conventionally been defined as a set of connected nodes and links. In infrastructural networks nodes are points of origin or destinations or intermediaries between links having some functional character like warehousing, loading, or discharging. The links are the connecting elements: roads, seaways, tracks, communication, and information linkages to name some of them. In this sense they are the facilities for the movement of goods and information. The network as a *social structure consists of social and other relationships between the partners*; between nodes which are e.g. individual persons or groups of people working cross-functionally between organisations. These ‘human nodes’ are regarded as actors. This implies that a network can be defined in general manner as *set of relationships between the parties*.

There exist different approaches to the network perspective. The classification of the network research tradition can be categorised as follows (Kamann 1998, 62, Törnroos 1997, 616,617):

- studies of community elites and related items, such as social support by social sciences, for instance the social exchange theory; social constructs and behaviour on interfirm level; social networks,
- regional science with studies on industrial complexes (referred to as the milieu, as pointed out by Cova *et al.* (1998), Castells (1996), Capinari and Kamann 1998); regional networks,
- research in industrial marketing with the main interest in the seller-buyer relationship, industrial networks, in broadest sense also value chains; and contractual issues under consideration; and
- research in physical networks including the infrastructure in traffic, spatial interaction, the optimal routing with deeper analysis on bottlenecks and barriers; infrastructural networks and technological nets.

In the discussion on different industrial networks, Andersson *et al.* (1994, 229,230) employ the term ‘*business network*’, which is ‘*a set of two connected business relationships, in which each relation is between business firms that are conceptualised as collective actors*’. In this thesis, both business and non-business relationships are scrutinised, since it is assumed that the former relationships are influenced by the later. In IM business, the stakeholders’ decisions (e.g. in terms of investments to transportation facilities and nodes) have remarkable influence on one actor’s ability to accomplish the business vision.

Spatiality is connected with networks in the form of the *milieu*, which has a special meaning. It is termed as ‘*a spatial set which has territorial dimensions but no predetermined border*’ (Kamann 1998, 63). Accordingly, the term milieu combines the ideas of a local net and/or focal net (compare to subchapter 2.5.). It can be suggested that the local area of South-East Finland and the transportation cluster are close to the milieu concept, addressing the spatiality as a tying element in the network.

Coupling the infrastructural analysis with the ideas of the social network theory a definition of particular network is reached; that is ‘*a network is a configuration of facilities between nodes allowing the entities to interact between the nodes*’ (Kamann 1998, 66), where

facility = link, tie, relation, or connection,
 node = origin or destination at a facility (respectively nodes can be either physical nodes or human actors), and
 entity = good, vehicle, container, service, information, or power.

The description of Kamann (1998) is in accordance with the most applied frame for depicting networks as systems. As stated, in conventional network analysis systems are defined through nodes and links. Accordingly, the link is a physical facility for moving goods with vehicles. Extending the traditional perspective for Kamann also the *relation can be a facility*. The more abstract concepts mean basically more convenient way to interpret the practical operations regardless of the mode; this consequence is quite important in intermodal studies (a conclusion addressed e.g. by Woxenius 1998, 77; also D’Este 1996 who addresses the events in modal interfaces from one mode to another).

Operationalising the term entity can be difficult because it is not easy to create a direct linkage between the wordings of social sciences (like power or control) to tangible factors (like containers) without a radical change in analytical methodology. Besides, in intermodal transportation the problems and functions in modal interfaces can be quite abundant - the interfacial element is included in facilities but not as comprehensively as by D’Este (1996). Nevertheless, the value of the conceptualisation by Kamann (1998) is in the comprehensive packaging of two main components: *the social (human) and physical (infrastructural)*. Furthermore, it is applicable because the nodes and links alone without the entities do not give an adequate view of all the ingredients in intermodal freight transportation if it is explained as a network phenomenon.

As noted above, regarding the logistics science the network analysis is conventionally based on two profound components between nodes: the physical flow of goods and the information flow attached. In order to deepen the analysis, the basic constellation has to be supplemented with non-traditional ingredients, which thus requires a combination of attributes (the entities) from social sciences (power, role). In addition, *an evaluation of connectors – such like links, ties, or bonds - is needed in order to understand the cohesive forces and determinants of the network structure*. For this reason bonds as tying elements are identified and analysed more deeply.

As regards the *Scandinavian network research* representing the industrial network view, there is an abundance of examples of successful use (e.g. Woxenius 1998 in intermodal context, Andersson *et al.* 1994 assessing the dyad in the network). The theoretical background is derived from the IMP- Group’s pioneering work (Ford *et al.* 1998). Though there are lot of differences in details, the researchers share the same theoretical background also on metatheoretical level, although the metatheoretical thinking is not explicitly embedded with these theories. Typical for the Scandinavian research are the following issues (Tikkanen 1997, 595):

- subjectivity and context boundness of reality and knowledge, both in business and research situations,
- emphasis on benevolent, co-operative behaviour aiming at mutual goals, which seems to refer to an intentional, voluntaristic view of human nature,
- reliance on the subjectivist focal firm's view on its own business context, and
- general interest in understanding the dynamic processes related to various complex, fragmented and textured network contexts.

Tikkanen (1996a) notes that the Scandinavian tradition is more *sophisticated* and *sensitive for postmodern research* compared to the explanations created by management-oriented scholars. In the American tradition the main focus is on the strategic network approach with one firm as a dominator establishing and governing the hierarchical system (compare to the SCM analysis by Cooper *et al.* 1997, Cooper and Ellram 1993 and Mentzer *et al.* 2001) with the same kind of assumptions: channel integration is *initialised* and led by one *leading* and *controlling* firm vs. the voluntarism and joint-governance in the IMP-based analysis). In the network creation procedure it is not possible for one firm to control continuously the entire system of co-operative actors working together.

3.2. Metaphorical Thinking

Despite of the fact that there is a debate about using metaphors in general among scientists, the network approach employs the idea of metaphorical thinking strongly. As mentioned, even the core concept of this study, the *network*, is more or less a metaphor in a similar way as related terms, as the description '*markets as networks*' (compare to the dualistic perspective suggested by Williamson 1986: markets and hierarchies linked to governance of interfirm activities). Axelsson and Easton (1992) accentuate that a network is actually '*a model or metaphor which describes a number, usually a large number of entities, which are connected*'. Even the basic constructs of the network theory are metaphorical in nature; besides '*networks as relationships*', '*structures*', '*processes*' and '*positions*' have the same connotation as well (Easton 1992,4). Though the classification of metaphors is beyond the scope of the thesis, the dualistic classification (marriage and business networks) could be relevant in this study as well (see Alajoutsijärvi *et al.* 1998 for more discussion).

The importance of metaphors is *twofold*: *first*, it is essential for further analysis to identify and understand the meta-theoretical roots of the theory that will be utilised. In an actor-based analysis, besides general understanding of the regularities, the analysis of the metatheories/y is a prerequisite (Tikkanen 1996b, 41) before the intensive working process. With the help of an axiom, which is based on a relevant metaphor (like *markets as networks*), the researcher is obliged to face the metatheories as well. Subsequently, the analysis, including the use of appropriate methodology, relies on these axioms whether they are relevant or not. The network approach is not a consistent entity but absorbs ideas from various sciences, mainly from the social exchange theory. When constructing a taxonomy for network studies, Araujo and Easton (1996, 68) analysed several disciplines and subdisciplines like sociology, organisation theory, social policy, innovation studies, political science, industrial marketing and purchase, economic geography, entrepreneurship studies and comparative studies of economic systems. They claim that the *social network approach* has been a *precursor* to all the

other approaches. Consequently, the IMP-based approach has been influenced mainly by the *social exchange theories*, thus stressing the *social networks in the nets/network* (compare to discussion in subchapter 2.6.).

Second, it is assumed that a chosen metaphor *hides as much it reveals*. This point is essential for logistics research, because in infrastructure-based network analysis the use of nodes and links has been a convention. Nevertheless, it should be pointed out that this assumption can be even misleading. In intermodal freight transportation many of the obstacles and problematic situations (and costs as well) are connected with modal interfaces. The rejection of the two-component model - links and nodes only - and replacing it with a *nodes-interfaces-links-* scheme can be adequate if the relations are to be scrutinised further. Thus, a chosen metaphor can be a constraint or a catalyst for the pragmatical analysis.

The *game* metaphor has been utilised explicitly by some scholars e.g. Håkanson (1992, 130,131) when explaining the interaction and evolution processes in industrial networks; the *chess game* analogy has been used to highlight the critical points in network development; in a quite similar way the processual development has been pointed out by Wilkinson and Young (1997) when using a dancing metaphor: the first of the examples is a conventional win-loose explanation and a later a win-win portrayal. Furthermore, one of the most typical arguments for deeper collaborative arrangements is to address the metaphor of the *win-win game* especially in partnership studies. This can be connected with synergetic effects as well. It seems that numerous scholars - at least theoretically - accept the win-win situation if a stronger relationship exists between the parties involved. However, Castells (1996,472) is quite sceptical when discussing this idea: he points out that for a networked society in general '*the losers pay for the winners*'. This implies that a zero-sum game is resulted under many circumstances in the modern world.

Many of the studies with a managerial approach have several features that tie them to the metaphorical group of analysis. Bleeke and Ernst (1995) have evaluated alliances between different participants using the strengths of the operators as the key elements, with special attention to the relative bargaining power of the partners. They present six types of alliances:

- collision between competitors, (mostly short term and failing to achieve strategic goals)
- alliances of the weak, (mostly failing followed by either a dissolution or acquisition)
- disguised sales, (rarely lasting due to unequal power of partners),
- bootstrap alliances, (again rarely working)
- evolution to a sale, (two powerful participants but the bargaining power shifts during the co-operation process) and
- alliances of complementary equals (two strong and *complementary* partners).

The last of the above types, *a marriage type of relationship*, is often the most long-lasting, eventhough the partners (often because of the compatibility) have different geographic or functional strengths. A challenge for the parties is to construct adequate control systems and governance on the one hand and enough flexibility on the other

hand. In this sense the issues are close to the network approach. Inevitably, these kinds of suggestions *affect the explanations on the interorganisational roles as well*.

A presentation of new adequate metaphors can change the analysis as well; e.g. Alajoutsijärvi *et al.* (1998) have explored the metaphors in order to enrich the scientific discussion with some new metatheoretical proposals. By analysing some of the most commonly applied metaphors such as ‘*network is a marriage*’ and ‘*network is a business system*’ (compare to the wording employed by Gummesson (1998) - ‘*society is a network of relationships*’), they came up with new kinds of metaphors. Accordingly, the *emotional* aspects in the networks as well as in the explanations could be worth discussing.

3.3. Basic Constructs of the IMP-based Network View

In his system-based dissertation regarding intermodal freight transportation Woxenius (1998) strongly emphasised the contribution of the Uppsala school of thought, the IMP-Group’s suggestions and the essence of the ARA- model, which contains three interconnected components: *actors, resources and activities*. The entity is a loosely-organised system reflecting the hopes and goals of the participants; in this both co-operative and antagonistic behaviour are evident. The actors (defined later in subchapter 3.3.1.) aim to increase the control of the network; the resources are human and physical and are controlled by the actors. The actors perform some activities, such as transformation acts and transaction acts. Appendix 2 contains a description of the components of the ARA-model, including also some proposals for extending the dimensions of the model (see also Håkansson and Johanson 1992).

Analysing the connection between a dyadic business relationship and a network is fundamental for the research. There is a dyad tied with *focal relationship* and the network, which is a set of two or more connected business *relationships*. The actor as a focal point is the *focal firm*. Consequently, in the network the *actors perform activities and employ resources*. The functions in the network are either primary or secondary: the primary functions are positive and negative effects on the two partner firms. The secondary functions - depicted as network functions - capture the indirect positive and negative effects of a relationship. The *network identity* is a *perception of the relationship* and has *two* connotations: *first*, how the two firms involved see themselves in the network and *second*, how they are seen by the other actors in the network; consequently it is the perceived attractiveness of a firm as an exchange partner.

Hence the role of the focal firm is close to the network identity. The network consists of constructive effects, but also of deleterious ones.¹ Typical for the network view is to reveal an interplay between two opposite forces, like the co-operation and conflict. An actor is obliged to search for some balance between these two opposite forces.

1) In order to describe the anticipated *constructive effects* on network identity, three basic constructs can be exposed: anticipated resource transferability, anticipated activity complementarity, and anticipated actor-relation generalizability. In a similar way the anticipated *deleterious effects* are powerful (Andersson *et al.* 1994, 6-11). The strong dualistic analysis enables the researcher to identify the two primary forces behind every relationship: the creative and constructive on the one hand and destructive and harmful on the other.

Under network approach, also the *dynamics of relationships* in terms of *exchange and adaptation processes* are widely discussed (Dubois 1998, 15, Axelsson and Easton 1992, Ford *et al.* 1998, also subchapter 3.3.3. in this study). With respect to adaptation, Holmlund (1997) prefers the use of the term *adjustments* when referring to the *simplest form of adaptation* within a dyad, which is crucial in the beginning of interaction process. When adaptation is related to governments and international organisations or even to finance, legal, or R&D functions, matching will result (Ghauri and Holstius 1996, 78). Basically adaptation is to fit or to match, which are the generic terms in marketing- based literature (see e.g. Porter 1998). Hence, adjustments are *short-term* adaptations.

There is an abundance of concepts applied in this particular network view. The *vocabulary* - as Tikkanen (1997) states - is enriched by many diverse terms, to name network relationships, network structure, network position, network processes, the model in general, focal firm, focal net, and the network substance and function. Compared to the more settled concepts in managerial sciences, the terms can be quite obscure, even abstract (Tikkanen 1997, 74). Despite of the numerous terms, the simplicity of the ideas can be a strategical weapon, as with these terms quite complex phenomena can be scrutinised in different contexts. Inevitably, the interpretation causes mix-ups in the analysis, as there are different variations for the concepts (see e.g. embeddedness in subchapter 2.5. or the role-position dualism in chapters 3.4. and 3.5.).

3.3.1. Premises of the Model

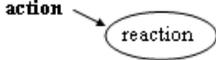
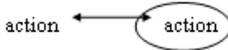
The Nature of Human Interaction between the Actors

Håkanson and Johanson (1992, 28) define actors as '*individuals, groups of individuals, parts of firms, or firms or even groups of firms*' that are engaged in the network. With this they represent two levels: the *microlevel* (people, individuals inside organisation, employees) and the *macrolevel* (firms or groups of firms on aggregate level). Because the network approach has roots in the social exchange theory *inter alia*, for many of the researchers the *microlevel* analysis has been the most adequate one. Hence, behaviour is explained typically in a stimulus- response- frame (the SR model) or having organism or some other determinants as the intervening factor (SOR) model. This construction implies several features and has an impact e.g. on the roles and identities. The structure is more or less a rough simplification, though implicitly included in many of the theories when a firm is understood as a hierarchy (and hierarchical governance) in the context in which the behaviour occurs.

On macrolevel the utilisation of IMP-based philosophy means also the rejection of the simple SR model; an interaction type of exchange (the actor-actor scheme) is thus addressed. This finding is proclaimed for instance by Ford (1997) when he states that the interaction approach means that the '*process is not one of action and reaction; it is one of interaction*' (op.cit., xi). The SR model describing the roles and asymmetry in power is one of the cornerstones in managerial explanations.

The following illustration depicts and compares how the *SR scheme* and the *actor-actor scheme* are employed on the macrolevel. It should be pointed out that the presentation is applicable on microlevel analysis as well. Regarding behaviour in general (interorganisational, interpersonal), *the illustration also explains some of the main differences between the theoretical underpinnings*. Furthermore, *the theoretical roles of the actors are rigorously linked to the setting*. In the table the oval presents the focal firm.

Table 3.1 Intermodalism under the Managerial and Network Views

<i>Reactive</i>	<i>Proactive</i>	<i>Interactive</i>
		
Strategic / Managerial view		Network view
Causalities Identifiable		Causalities Less Identifiable
Continuum of Partnership Arrangements		Range of Relationships
Simplest Form	Tightest Form	Simplest Form Tightest Form
Arms' Length	Alliance, Partnership	Transactional Structurally Bonded

The dualistic distinction between two different perspectives - the managerial and strategic - is consistent with the terminology proposed by Tikkanen (1996a, 1997, 1998); e.g. even the verb to manage should be replaced with more neutral words like to *develop* (Tikkanen 1996b, 37, 38). In fact, in the network approach the concept 'to develop' is more in focus than 'to manage' due to the very basic difference between these two ideas. The example has an implication for the analysis as well: in network thinking the actors on multiple managerial levels are essential for the research in contrast to the strategic view, in which the executive/top level performance is often under consideration. The classification is undoubtedly dualistic, and stems from the theoretical differences between these two distinctive approaches. In practice, however, the issues are more mixed than clear.

Interfaces and Boundaries

In IMP-based thinking there is a strive to address more the *interfaces* than borders when a single firm as an actor is conceptualised. Araujo *et al.* (1998) claim that a firm's boundary is actually a *set of relational interfaces*. The two driving forces, co-ordination of activities and combination of resources, are associated with the control that is required among the actors. In the IMP - based research the boundaries between a firm

and its environment are fuzzy in nature. This is due to the basic proposals of the theory: the main focus is on a set of relationships, *not* a set of firms, which is more typical.

Dubois (1998, 116,117) points out that traditionally firms are assumed to control resources through ownership, which means clear and identifiable boundaries for firms. Furthermore, firms can manage and control their activities independently. In the network theory the *interdependence* (and mutual dependency) is highly emphasised: *‘the design and organisation of activities is not based on resource control but on activity interdependence’* (Dubois 1998, 116). Furthermore, critical for the analysis is *how and to what extent* the other firm’s activities are influenced. The adaptation of activities on one hand and reactions on the other are linked to activity structures as well (Dubois 1998). The following figure illustrates the question of control over activities and resources (Håkanson and Johanson 1992, 36, Dubois 1998, Araujo *et al.* 1998).

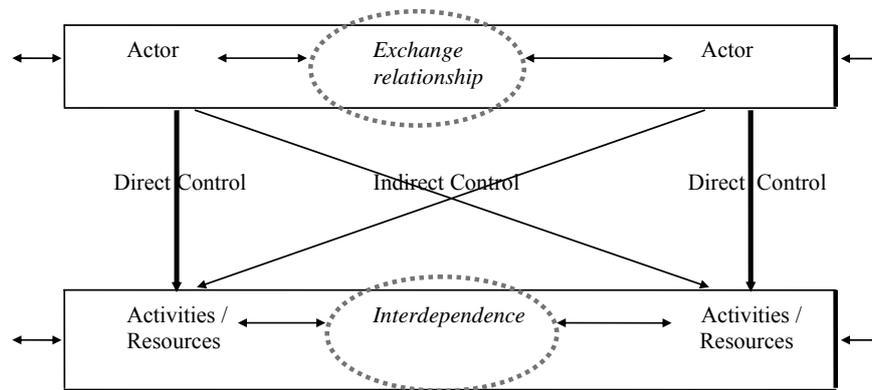


Figure 3.1. Relations between Actors and Activities and Resources in Production System

The exchange relationship is created as a linkage expressing connectedness between the actors; it arises when tangible and intangible resources are transferred between partners (Halinen 1994). Furthermore, there are two different outcomes because of this: *relationships* and *exchange relationships*. A relationship might not include transfer of resources (e.g. between a focal firm and a stakeholder as a supportive actor). In an exchange relationship the *transfer of resources* is an obligation, which is evident in all business relationships. Accordingly, a focal firm can have relationships without direct exchange; this is typical in IM business in which e.g. port authorities have a deep influence for successful transportation business e.g. in terms of new investments. Furthermore, firms *can not control solely and hierarchically the resources* as presumed in the managerial view; this implication does affect the reasoning of intermodalism as well.

The explanation discussed above emphasises the activity interdependence. However, the resource and activity dependency have not been deeply analysed or discussed in IM research work, especially when analytical approaches have been used. Because of strong interdependencies between activities, at least some co-ordination is needed

among the actors. By modifying the activities, new forms of boundaries are evolved. Easton (1992, 19) is of the opinion that *structuredness* defines the level of interdependence, having an impact on firms' boundaries, too; there is need for *boundary-spanners*, which are not typical in tightly structured networks, such as the IM network. This situation can be characterised as an internal inertia because firms are often tightly constrained by a range of features (e.g. legal, established tasks) and there are several barriers to both to exit from and to enter a network. Presumably *the internal and external entry barriers in the IM network strenghten the roles uncovered*.

Events

Events as concepts are important in network analysis, as they can be *triggers of change* in the network, thus embracing the dynamical side of the network performance. Some scholars have even proposed and utilised the term *event* or *critical event* in network analysis. In general the term has a strong temporal connotation (Hedaa and Törnroos 1998, Halinen 1994, Halinen *et al.* 1999). An event is an *incident* or an *outcome* connected with an activity, namely '*acts and activities are the outcome of how actors have been able to identify events, how events have overcome the SR barriers, and how willing an actor is to go further by action in response to stimuli*' (Hedaa and Törnroos 1998, 489). This means that an event can be an outcome and a cause. The explanation gives space for unexpected factors as well: *an event can be caused by nature* and thus not only by an actor in a dyadic relationship, which is rather typical (Halinen *et al.* 1999). Furthermore, Hedaa and Törnroos (1998) even suggest the use of an *event-based network*. On the other hand, it could be suggested that outcomes are a part of the processes for exchange relationships. This means that acts and activities are *not outcomes* but more *causes* for outcomes; which implies that there are mainly two distinctive features in interaction: the *process* (of acts, actions, episodes, and even events) and *outcomes*.

Halinen (1994, 83) explains events as issues which are '*decisive for the relationship, and function as driving or checking forces for its development*'. This implies that events should be identified, recognised and recorded by the actor that is responding. Furthermore, there are processes caused by a decision-maker or some identified external force behind the events. Though there is a difference between the definitions, they are more or less parallel. Hedaa and Törnroos (1998) focus on outcome, whereas Halinen (1994) more addresses the process characteristics. Unquestionably, an outcome, such as a redesigned activity can be a part of a process for a long-lasting relationship. In this sense the outcome is always caused by events; furthermore this outcome is a part - a connecting and mediating element - of the process. Moreover, the true importance of events lies in the fact that *they are essential for understanding the network dynamics*; as Halinen *et al.*(1999, 786) put it, a critical event is actually '*an incident that triggers radical change in a business dyad and/or network*'. Besides, it can be assumed that events can break the deep stability in the networks especially if inertia is causing robust stability.

3.3.2. Relationships in Dyadic Interaction Models

Interaction Causing Relationships

In this subchapter, particularly *relationships* are discussed. Created through *interaction*, they are key elements in the network view. It is of major importance for the study to link these two generic terms and discuss how the interaction processes actually generate relationships. With respect to interaction *per se*, in IMP- based model creation four basic elements are present: the interaction process, the interacting parties (both the organisations and individuals as actors), the interaction environment, and the atmosphere (IMP Group 1982 as reprinted in Ford 1997).

Accordingly, an interaction process is a major operational tying element between two organisations, causing relationships. Furthermore, in the long run adaptation and institutionalisation have an impact on the relationships as well. For atmosphere, besides co-operation and closeness, also the power and expectations influence the nature of the interaction. Regarding the environment, the market structure is one of the features that have impact on the relationships (note: the environment as conceptualised in IMP modelling is different from that in managerial explanations, see subchapter 2.4.).

Basically, the analysis of the content of the interaction is faced by a multitude of dimensions.¹ Besides relationships, also *episodes* can be identified. The episodes are mainly transactions in a short term, and relationship denotes more long-lasting collaboration between partners. An episode is *short term sequence of acts* (e.g. a single shipment can include a great number of intervened acts). Episodes are thus interconnected but identifiable actions, whereas interrelated episodes are *sequences*. The episodes are later gathered to *relationships* between the partners. Regarding the services, the entire interaction process can be divided into three components, namely *acts*, *episodes*, and *relationship* (Grönroos 1997, 9). Accordingly, *act is the smallest unit for analysis*; acts are related to interaction elements (in practice e.g. information, physical goods). Holmlund (1997, 96, 97) enhances the dichotomous IMP classification (episodes-process) by proposing that the most detailed type of interaction is *action, not act*.

1) When evaluating the complexity of interactions, Ford *et al.* (1998) discuss several *aspects of interactions* with four key concepts: capability, mutuality, particularity and inconsistency.

According to Håkanson and Snehota (1997), a relationship is a '*mutually oriented interaction between two reciprocally committed parties*'. This means quite a dynamic view for a relationship. Thus, a relationship is developed over time having *past, present, and future dimensions*. In addition, relationships are rather consequences or outcomes, because of the common history. In the network view, which explains the relationships in an organic way, they often just happen (in SCM relationships are created because of the strategic intention). Thus, to plan in advance the nature and pattern of relationships is inadequate or as Holmlund (1997, 6) postulates '*relationships are not determined a priori*'. When interacting, the parties have intentions and they *make interpretations* of the interaction (Ford *et al.* 1997, 57), which means that *they give meaning for the details while interacting*.¹

As noted, a relationship refers to quite a long-term commitment, whereas interactions *represent the dynamic aspects of relationships*. Hence, interaction as a term '*comprises the exchange processes and adaptation processes*' (Easton 1992, 8). These two major interorganisational processes are often added by some other like institutionalisation (Håkanson and Snehota 1997; in their wording institutionalisation matches very closely with bonding) or co-ordination (Möller and Wilson 1995). Occasionally, adaptation refers actually to *adjustments*, which are more short-term notions (Holmlund 1997, 1998).

Moreover, a firm has a *portfolio of relationships* which it can actively develop. The relationships between actors can be direct or indirect; these two dimensions are central to understand the variety of relationships between firms and the creation of networks, as well. Also the *quality* aspect can be added to these two dimensions: the direct relationships' relative importance can be greater than that of the others.

1) Holmlund (1997) constructed a model for analysing the perceived relationships quality (PRQ) between network partners. When the actors are assessing the perception, a certain amount of outcomes is needed in order to make an analysis. The analysis explained by Holmlund (1997) has similar ingredients as the suggestion by Thibault and Kelly, as they constructed a variable CI alt to depict an outcome. Later this has been utilised by several researchers within a dyadic relationship (e.g. Han 1997, Anderssen *et al.* 1994) or between the channel members (e.g. Andersson and Narus 1990, Salminen 1997); for them CI alt is '*a standard that represents the overall quality of outcomes (economic, social, and technical) available to the firm from the best alternative relationship*'

3.3.3. Primary Interorganisational Processes

Exchange

As the previous subchapter explained, the interaction includes two major processes – exchange and adaptation. In this subchapter the contents of these two attributes are discussed briefly.

The word *exchange* in general business rhetoric is associated with interaction. The interaction in relationships ‘*comprises processes of exchange including business, information, and social exchange*’ (Salmi 1995,27). In this sense the information is more impersonal, official, and even normative in nature. Information exchange is mainly based on legal contractual commitments between the actors, though non-contractual ties are important as well. Furthermore, the chosen technology affects the information exchange. The social side of exchange is seen as a bundle of societal processes on *different managerial levels*. There are four elements which are exchanged: product or service, information, financial exchange, and social exchange (IMP Group 1982/1997, 9).

The ontological term exchange is not explicitly embedded in the network thinking. The word stems from various other scientific disciplines. In a single economic transaction exchange is understood by economic and/or business means. In the network approach, however, the term is dedicated to a range of dimensions and aspects. Besides economic and business exchange, the social, information, technological, and even political exchange is stressed. As such, the exchange concept can be associated with bonding or activity link concepts, as explained under the network approach (Olkkonen 1998, 506).

Particularly in marketing literature the exchange concept has mainly three main dimensions: the exchange paradigm is established on discrete transactions, on hierarchy (as explained in the TCA approach according to the Coase-Williamson- theory), or on relationalism (Olkkonen 1996, 140). Of these paradigms the first is a simple and impersonal transaction mainly based on price. The third has exchange relationships as a focal point in a series of transaction episodes. This means that these two dimensions (pure transaction-exchange relationship) are the ends of a continuum.

Contrary to the above, Grönroos (1995) dislikes the use of the simple exchange concept because it gives quite a narrow view and is even contradictory in nature. He distinguishes between two terms instead: exchange has a short-term notion and relationship a long- term notion ‘*implying an association of two parties*’ (op.cit.,13). Furthermore, *value* can be even more important than exchange and - as Grönroos (1997, 16) states - the value is ‘*embedded in the exchange*’. Accordingly, it can be assumed that it is possible to have *value adding relationships without transactions or even exchange*. Hence, the value of relationship *per se* can be high enough for the actors; they can be defined as fundamental resources. When relationships are established, investments as well as maintenance are required in order to eliminate a possible dissolution.

With respect to the *social* exchange (e.g. in focal nets), both utilitarian and non-utilitarian motives are presented by Cova (1994). Accordingly, a continuum of exchange forms can be expressed, starting from *pure exchange* with discrete economic

exchange, to *pure gift* transactions in which no economic expectations from the other party are required (for more details see op.cit., 291-292). Because of the fact that the network theory has absorbed theoretical impressions from other sciences, mainly from the social exchange theory, also the concepts of trust, commitment or co-operation are often in focus (e.g. Anderssen *et al.* 1994). The importance of exchange for the relationship is twofold: it is an *essential ingredient in perceived satisfaction* and it is an *element in the constellation* in which the *determinants* that lead to higher *satisfaction* are assessed. Furthermore, trust leads to more co-operative activities and later to higher satisfaction. This has been noted e.g. by Andersson *et al.* (1994, 19), when they claim that relationships are heavily *influenced by earlier interaction between actors*, including the nature of the exchange as well. The conclusion is, thus, quite evident but maybe not fully explained in simple interaction models. Because of this e.g. Håkanson and Snehota (1997) require more analysis with strong concentration on the time element in related studies.

Adaptation

Besides exchange and co-ordination processes, also *adaptation processes* between the partners are of major importance; adjustments have to be made to guarantee the effectiveness of a mutual relationship. Occasionally adaptation means reciprocal learning and shared experiences. Adaptation means 'to fit' or 'to match' although matching is broadens the conventional micro-perspective with macro levels (see e.g. Ghauri and Holstius 1996). Fitting is not just between firms and the markets, but also with the environment in a similar way as adoption (to take over an idea or technology for one's own purposes), which is more influenced by external determinants.

The Transaction Cost Analysis (TCA) frame as a theoretical approach also considers the adaptation problem, which means difficulties with modifying agreements to changing circumstances e.g. because of environmental uncertainty (Rindfleisch and Heide 1997, 31). In this sense the TCA is close to the network explanation, though in transaction cost analysis more interest is shown in macrolevel adaptations and the questions of adaptation. In modern marketing theory, in which adaptation is one of the major dimensions, the concept means fitting and modifying the capability to the needs of the customers. In fact, customisation as explained in marketing science (e.g. tailoring, modification, several other value added functions in manufacturing processes) mainly means products or services for customers. It should be pointed out that dyadic adaptations should be distinguished from adaptation processes, which have broader perspectives on the macrolevel; that is on the network level.

Brennan and Turnbull (1998a, 398) define *dyadic* adaptation by stressing the behavioural and organisational modifications at multiple managerial levels. Furthermore, these actions are '*designed to meet specific needs of one other organisation*'. In brief, the adaptation consists of three main elements: *all the identified behavioural (social), organisational, and technical modifications and configurations for the network partner or operator*. Often, the major trigger for the modified behaviour is an external constraint, pressure, or opportunities, which require reactions within the entire network. One of the members can be an *initiator*, provoking others for behavioural modifications. This implies that a recognised or recorded conscious incident or modification is a part in the adaptation process. However, some of the

adaptive actions are unconscious by nature, and an actor can employ a new role without any personal notice.

Adaptation is not just a process indicating some form of a relationship, but a critical element in partnership as well, because it *creates mutual trust* for the operators. Hence, the prevalence of adaptive actions between two parties indicate the maintenance of a long-lasting relationship, whereas the lack of adaptations refers more to transactional and simple *ad hoc*- type of relationships (Brennan and Turnbull 1998b). The importance of adaptation is *twofold*: *first*, it is a prerequisite for trust and *second*, it is one of the constructs in a long term, structurally bonded relationship.

There is need for modified and re-organised activities (having impact on the activity structure and the relationships) in order to ensure the maintenance of an exchange relationship and to avoid temporal hindrances and malfunctions; synchronisation is required on every managerial level. *Modifications are needed because the counterpart may expect them*; in this sense these activities *have impact on the roles*, as well. Activity links are means for adaptations, as they combine activities between two operators involved in a long-lasting relationship. Unquestionably, the resources are modified and configured according to the needs of the counterpart. Hallen *et al.* (1991) draw the conclusion, that in the *adaptation process both unilateral and multilateral sharing of power exists*. A unilateral case is a consequence of imbalance of the power. This explanation is, thus, consistent with the actor-reactor scheme. Multilateral sharing means reciprocal demonstrations of commitment.

Accordingly, *commitment* is shown through *willingness to adapt* different behavioural matters, e.g. readiness to accept a computer-based information system once adopted by one of the net members. In this process a partner is gradually presenting trustworthiness, first by awareness, then by interest, and finally by acceptance. Besides, adaptation is one part of the structural bonding between partners. When contemplating the antecedents for structural bonding, Han (1997) proposes that one of the variables describing this special bonding type is technology. Though technology mainly affects structural bonding, it can also have an impact on social bonding. By implementing similar procedures the partners involved in the relationships express that they are ready for additional commitments in the long run as well. This is a positive feature and a signal of trust improving the interpersonal relationships on multiple managerial levels. Regarding the adjustments, it is not a question of synchronising the processes, but also the technological, administrative, and even behavioural characteristics.

When presenting a way to *classify various types of adaptations*, Brennan and Turnbull (1998a, 34,35) use the following taxonomy: *resource commitment* (high with production process-low with rescheduling the deliveries), *proactive/reactive* (requested by the partner (reactive) or maybe initiated without request (proactive)), *voluntary/coerced* (adaptation may have been conceded willingly (voluntary) or may have been enforced by a more powerful partner (coerced)), *reciprocal/unilateral* and *formal/informal* (formally agreed with contractual arrangements).

With respect to roles, the question of requested and coerced adaptation arises. Reactive adaptation behaviour as a response to the initial provocation made by the counterpart can refer to the role of the reactor. It means that the actor under consideration is more or

less obliged to obey the internal norms. However, and from the theoretical point of view, *coercive adaptation* is more *adoption* than real adaptation.¹

The *process for adaptation* has different stages as well (Holmlund 1996, Brennan and Turnbull 1998a). First, there is *identification* of suitable and appropriate technology. Later legitimation is needed to ensure the relevance of the technology as a driving force for a more intensive interfirm cohesion. Later, adaptation will occur. As regards the depth of the adaptation process temporally, besides conventional matching on the microlevel, accommodation represents a deeper form of adaptation in this study. Accommodation means that the fitting is more a less an obligation for the other party to adapt. An even more comprehensive form of adaptation is assimilation, in which the process or a procedure will be incorporated fully; as a consequence similar processes exist between two parties. This is close to diffusion between partners - a consequence which has been proposed by Brennan and Turnbull (1998a, 1998b) - for adaptation in the broadest and tightest sense.

The adaptation process is associated with the *learning process* as well. Through cognitive bonds it is one of the major assurances for an on-going relationship; it can be even a prerequisite when a relationship is established. Furthermore, without adequate adaptation, a relationship may not be developed properly in the long-run. Easton (1992) distinguishes between two elements - adaptation and exchange - when elaborating a simple transaction between partners. The more exchange there is between the partners involved, the more probable intensive adaptation will be. Moreover, adaptation has a long term notion. In this sense adaptation is even required to ensure a long-term relationship.

The adaptation *per se* is associated with activity links which are '*used in order to grasp to what extent adaptation of the firms' respective activity structure has been done*' (Dubois and Waluszewski 1998, 187). There have to be some modified and re-organised activities (and later activity structure configurations) in order to ensure the maintenance of the exchange relationship.

3.3.4. Interaction Processes and Outcomes: a Synthesis

Considering the discussion in previous subchapters 3.3.2. and 3.3.3. above, it is now claimed that the interaction has two complementary aspects: the processes and the outcomes. These aspects can be found among all the actors involved: interaction is a multilevel phenomenon due to numerous managerial levels that are exposed to exchange. Besides personal - which can be formal or informal, impersonal interaction is apparent, e.g. technological adaptations. The following illustrations depict the levels of interaction with four distinctive layers (modified from Frankel *et al.* 1996, Han 1997, 23 and Möller and Wilson 1995; compare also to figure 5.3):

Formal and Informal, Personal Interaction Process

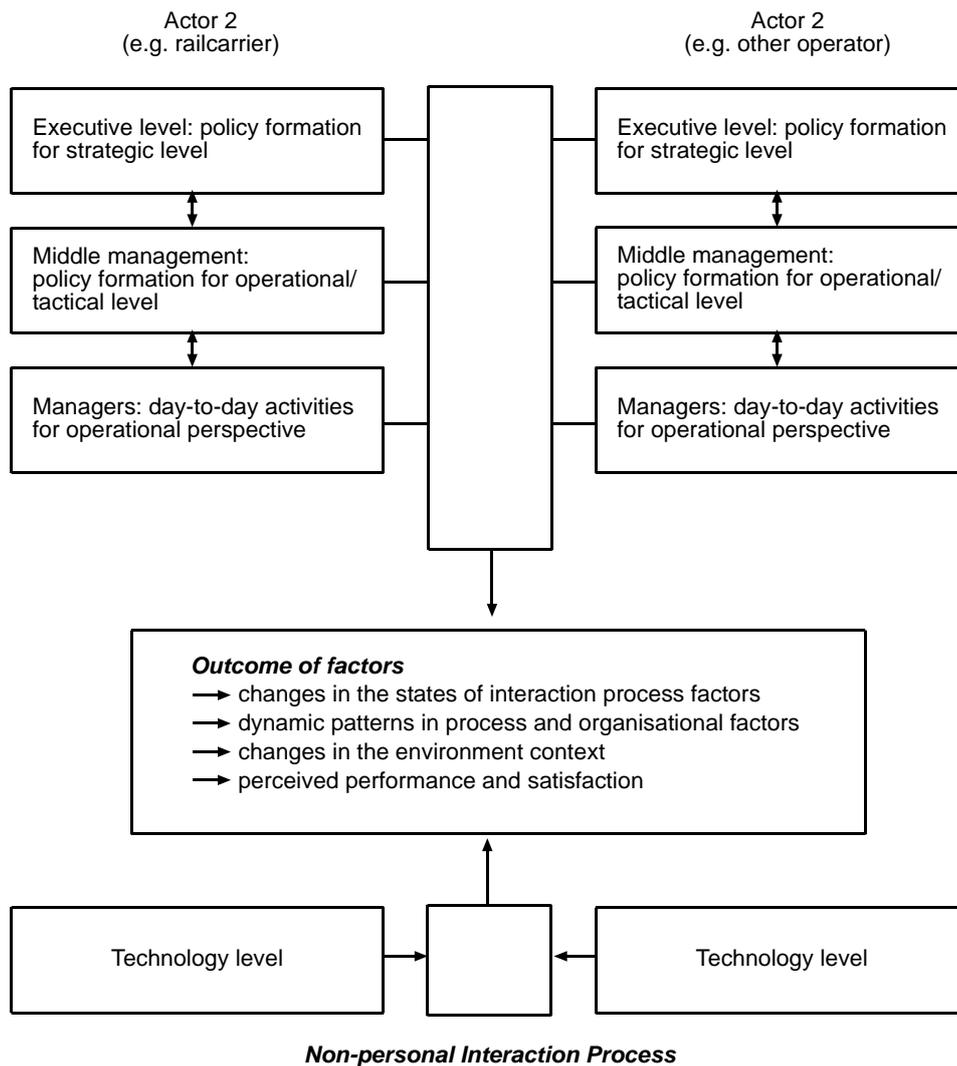


Figure 3.2 The Interactive Processes and Their Outcomes

The presented scheme is a modification of the dyadic interaction model originally presented by Möller and Wilson (1995). Accordingly, a set of affecting variables with five different groups can be proposed:

- *contextual factors*: environment and situation (e.g. market concentration, characteristics of firms),
- *task factors*: degree of complexity and innovativeness of focal objects of interaction, their exchange frequency,

- *organisational characteristics* in terms of experience, resources, or management on an organisational, departmental/functional, group and personal level,
- *outcome factors*, which comprise bonds as perceived by the firms, and performance outcomes such as effectiveness and efficiency, (compare to Holmlund (1997), when she argues, that the *perceived* results of the processes on different interaction levels are *outcome domains*, which means that this concept is related to the process perspective of relationships), and
- *the interaction process*, which contains exchange, adaptation, and co-ordination processes.¹

For this study the contribution of the model is noteworthy, as it explains the outcomes (e.g. changing roles) as a result of bonds. Besides, the outcome is a result of interaction on multiple managerial levels (formal, informal), including the assessment of the satisfaction as well. Moreover, the purpose of the virtual processes is clearly defined as the basic elements in the mutual interaction. Besides including a situation, the contextual factors can also grasp the environment.

Technology can be seen as a crucial element in the interaction process, as technology means a process of transforming inputs to outputs. In organisational technology a sequence of events is defined: admission of input (e.g. knowledge) into the organisation, conversion of this input to output (through application of skills) and disposal of the output into the environment (Han 1997, 23). On the technology level the *adaptation of adequate technology* is of a major interest in the process of interorganisational behaviour. It can have an impact on social relationships and bonding as well.

1) The original model proposed by Wilson and Möller (1995) has several applications in different contexts (e.g. Frankel *et al.* 1996, Han 1997, Halinen 1994); e.g. in the study by Halinen (1994) the indispensable *prerequisites* for establishing a relationship are addressed as well as the *perceived outcomes of an interaction process*. The adaptation as a component in the bonding as well as its dimensions - social, technological or other - have been investigated, though not with logistical issues in foci (Hallen *et al.* 1991, Wilson and Jantrania 1997, Han 1997, Naude and Turnbull 1997, Williamson 1991). Regarding the interaction model by Möller and Wilson (1995) and the strong emphasis on processes, Pettigrew (1998) proposes five features that should be viewed in processual analysis: *embeddedness*, studying processes across a number of levels of analysis, *temporal interconnectedness*, studying processes in past, present, and future time, *role* in explanation for *context* and *action*, search for *holistic* rather than linear *explanations* of processes, and a need to link process to the *location* and explanation of *outcomes*. Pettigrew's proposal (1998) is consistent with that of scholars who have explained and utilised the processual analysis (e.g. Tikkanen 1997, Halinen 1994).

As stated, relationships are *resources* and they *have value*. Wilson and Jantrania (1997, 300) describe the value with three different dimensions: *economic, behavioural and strategic*; in the strategic dimension an actor aims at gaining competitive advantage or strives to strengthen the core competencies. Furthermore, Holmlund (1996) has categorized economic, social, and technical dimensions. Järvelin and Mittilä (1998) have enhanced the dimensions by presenting an ultimate dimension.¹

Consequently, the relationships *per se* and *more particularly their dimensions attached by the idea of quality* can represent the positive perceptions, when an actor considers the benefits of the interaction. The dimensions mentioned can thus raise the value but also trigger out more intensive and deep collaboration, because the relationships *per se* are loaded by the value.

Derived from empirical studies for *relationships in the network context*, some general observations can be listed (Dubois 1998, 15,16):²

- continuity: the major relationships of a company are often long-lasting,
- complexity in terms of the range of contacts among individual firms,
- low degree of formalisation: formal agreements have seldom been found to be used as a means of handling uncertainties; on the contrary trust seems to be of main importance and more relied on,
- symmetry in resources and initiatives: both parties are controlling resources which are of main importance to the counterpart,
- adaptations: both parties make them, for instance logistical, technical, or administrative adaptations,
- both co-operation and conflicts are present (compare to deleterious and constructive effects presented by Andersson et al. 1994), and
- connectedness: the relationships are connected in many ways and to different extents; the technical content is quite important.

1) The context in which the proposals have been made affects the content of the dimensions discussed. In both studies a typical seller-buyer- relationship has been under scrutiny, referring to dyadic relationships, and ignoring the behaviour on the network level. For Holmlund (1996, 84) the dimensions refer to different aspects of the content. Furthermore, she suggest the use of the concept *domain*; with it she means an *'arena in the value creation process within the relationship where quality is observed'*. At the same time Holmlund (1996) - with reasons - criticises the dimensions discussed by Wilson and Jantrania due to the fact that for Wilson and Jantrania the value is understood as a positive feature implying the *'benefits'* without any notion to investments or other *'sacrifices'*. Furthermore, the genesis of value expressed by means of a simple correlation has been launched by e.g. Grönroos (1997) with PRV- formula. There is a correlation between PRQ and PRV: the former denotes *'a characterisation of the focal firms' perception of RQ as a combination seen outside of the dyad*, whereas the latter includes *'a comparison of quality and investments as perceived by the firms.* (Grönroos, 1997. 79). The outcome, *a quality*, is an important factor when value is assessed and measured representing the *'gets'* or the *'rewards'* (compare to the value creation logic in logistics, and the significant role of perceptions). Järvelin and Mittilä (1998) add the *time-element* to the relationship's quality; this means that instead of using a single relationship quality measure, a distinction should be made between two items: the episodes (a short-term notion) and relationship (a long-term notion). Subsequently, there is a slight difference between the perceived quality in the short and long run (Holmlund 1997).

2) Dubois addresses the importance of non-contractual commitment in relationships, which can be even a tool for mutual governance. In the embryonic phase the contractual ties are important - not for governance but more for establishing and strengthening the relationship.

With respect to interacting parties, in a *dyad* two partners aim to co-operate together and gradually deepen the collaboration employing the activities and controlling the resources. This constellation is identical to partnering studies in which the dyadic perspective is emphasised. In its initial stage a dyad is more loose co-operation (or *dialogue* as noted by Grönroos 1995) than strategic activity. In the interaction process, predominantly two firms are involved; often this dyad is also under scrutiny. However, some researchers (e.g. Salmi 1995, 39) have the *focal firm* as the main point of interest in the research.

The *atmosphere* consists of conflict and co-operation (Easton 1992, 14). Atmosphere is thus a result of interplay between these two opposite forces; it is resulted in '*power-dependence relationship which exists between companies, the state of conflict or co-operation and overall closeness or distance of the relationship as well as by the companies' mutual expectations*' (Easton and Araujo 1992, 69). Hence, the atmosphere is not influenced only by conflict and co-operation but also by *competition*. A conflict results if hostile and destructive competition or a dissatisfying dyadic relationship is perceived. Competition on the other hand, can lead later to co-operative arrangements like partnerships.

3.3.5. Patterns of Bonded Structures

In the previous chapter, the outcomes of interorganisational processes were discussed; the outcome is caused by the processes for which actors expose themselves. The outcome factors can comprise actor bonds, as well. With these bonds a tying element between the actors can be created. Moreover, according to the network approach a network is actually a set of firms containing a bundle of different relationships, which are created in the interaction processes. Thus, the entire network can be characterised with the number of different actor bonds between the members. Hence, bonding as a phenomenon is a key construct in the network theory: the *connectedness* means that the *relationships between the actors are tied up with diverse bonds and structural bonding mechanisms*. This connectedness is influenced by the degree of bonding between the actors. Furthermore, the adaptation as an interorganisational process is for creating and maintaining the appropriate relationships, and thus reinforcing and strengthening the network structure as well.¹

1) Considering the determinants in the tying process, four elementary items can be mentioned: mutual orientation, dependence, bonds and investments (Ford *et al.* 1998). According to Håkanson and Snehota (1997,153; also Tikkanen 1996b) a relationship that represents both mutual orientation and commitment, can be characterised with three major elements: *activity links, resource ties, and actor bonds*.

Bonds as Links

Bonds in general are binding forces between actors; a bond ‘*implies a measure of tying*’ as Easton (1992, 10) states, though in quite a dynamic way because they are developed over time (Järvinen 1997, 38). It can be argued that bonds have many dimensions, such as economic, social, technical, logistical, administrative, information, legal, and time based ones (Easton 1992, 11). Bonds are resulted in continuous and repeated interactions and relationship-specific adjustments and investments are needed. Furthermore, they ‘*provide opportunities and constitute constraints for the focal firms*’ (Holmlund 1997, 331). Bonds can have two different notions: *short-run* (practical, operational) and *long-run* (structural, relational) bonds.

As regards single bonds, the following variations are typically distinguished: (Salmi 1995, 27, Venetis 1994, 726, Järvinen 1997, 279, Thunman and Seyed-Mohamed 1994, Halinen 1994, Wilson and Jantrania 1997, Heikkilä 1999, I, modifications by the present author)

Table 3.2. Types of Actor Bonds

TYPE OF BOND	CONTENTS
<i>Economic</i>	pragmatically e.g. special credit agreements and terms of payment; comparable to structural bonds, dependent upon the satisfaction with the term of the current exchange; price and cost the most appropriate details in the content; in general the TCO is the most appropriate tool for assessing the economic benefits; however, possible to reveal relationships without the economic element
<i>Legal and financial</i>	e.g. long-term contracts; maybe less binding than they appear; can be a signal for parties that because there is need for a legal bond other forms may not work well
<i>Technical</i>	e.g. common technology, process adjustments
<i>Cognitive</i>	e.g. knowledge about the counterpart; partners have gained a thorough understanding of each other
<i>Social</i>	e.g. mutual confidence and trust including personal linking; on company and personal level; also different forms of social exchange like friendship or diverse spare time activities; besides mutual commitment, which is more or less an outcome of a long-term relationship, also investment, trust and attachment/attraction can be posed
<i>Communication - (subcategory to social)</i>	e.g. spoken words in interpersonal interaction expressing trustworthiness, how arguments are explained and how they strengthen the social linkage between two actors; the slang, expressions, and rhetoric in general; how information is decoded and encoded; the significance and strength of non-verbal communication; the use of communication appliances in personal interaction; the frequency and intensity of the contacts in communication
<i>Planning</i>	e.g. functional co-ordination
<i>Time-based</i>	e.g. dependency on delivery times and other time-related issues; delays when promises should be kept; also a flexible appointment system; in general the interpretation of time and willingness for time compression, it is assumed that the time related bond is for linear time measure; time is inherently associated with culture and non-linearity is evident among many business cultures
<i>Administrative</i>	relate to administrative routines and procedures; close to organisational aspects: a sub-category for organisational bonds
<i>Organisational</i>	organisational issues between parties in general

Without doubt the setting under which the dyadic interaction occurs, strongly influences the importance and type of various bonds. Besides, the variations listed are a *compilation of the work of numerous researchers*. With reason, a researcher can add several other bond types like attraction or equality or even geographical bonds (Järvinen 1997, 291,292).

Halinen (1994) classifies the bonds listed above to *operational* and *relational*. The operational bonds refer to concrete ties in daily operations like knowledge, social, economic, and planning bonds. The relational bonds have a more abstract meaning: they incorporate the parties' bilateral *expectations* of future interactions (op.cit., 72, 73). The relational bonds have three essential sub-characteristics: *attraction, trust, and commitment*. It is assumed that social bonds transcend or even replace the economic bonds (Easton 1992). In this study, however, both of the main bonds are assumed to have equal impact on mutual interaction. Besides, contextual commitment presenting a legal bond is a basic assurance for reciprocal co-operation. Furthermore, the bonds have many *properties* such as *tensions, importance, and strength* (Järvinen, 1997, 277, 278). With respect to social and legal bonds, it can be noted that the strength of formal-legal ties is not emphasised. The social bonds, like confidence and trust are mainly stressed. The true nature of trust undoubtedly has an impact on the contents of formal agreements, as well.

Managing the actor bonds is a problematic issue. The management is shaded by the managerial activities of some other actors, as well. Regarding the question of how bonds can be managed, it can be claimed that (originally presented by Håkanson and Snehota 1997, also Tikkanen 1997, 66) *first*, it is possible to construct and maintain strong bonds with a limited number of counterparts (requiring both investments and prioritising), and *second*, with bonds an actor can gain intelligence regarding the changes. As noted, the adaptation process is one of the key processes (compare to Dubois 1998) because the changes in the network are partly consequences of the adjustments made by the partners. Besides, to achieve intelligence, mutual learning is required as well (Dubois 1998).

Structurally Bonded Relationships

In the previous chapters the dimensions of the relationships were discussed. These relationships can be illustrated with two additional dimensions: the *breadth* and *depth* of interaction express the state of the relationship (Azimont *et al.* 1998). The depth of interaction '*indicates both the level of the actor's involvement and the degree of the customer's willingness to interact (...)*' (op.cit., 126). The strength of relationships is one of the constructs in the network position and is influenced by the reciprocal commitment, which is furthermore influenced by bonds, bonding and perceived satisfaction.

In this sense the strength of the relationship, implying roles is strongly linked with commitment and bonding (compare to the equations presented in the next subchapter). Also, it is essential to understand *for whom* the relationships are constructed. In this thesis a focal net will be constructed, having three types of actors: *core actors, supportive actors, and others*. Parallel to this classification it is assumed that the relationships differ slightly regarding whom these relationships are aimed at. For this

reason the relationships are occasionally classified with three layers: *business relationships*, *the supportive relationships* and *infrastructural relationships*.

In close relationships *structural bonding* may arise over time. Then the relationship is tied up with an assurance against possible opportunistic or antagonistic behaviour of the counterpart. This means that *bonding* is both a *prerequisite* for a closer relationship on one hand and a *tool* for improving the effectiveness of the relationship on the other, especially when protecting oneself against unexpected temporal troubles and disturbances a relationship may occasionally have. In the long run there is a need to create and maintain a diversity of structural bonds in order to guarantee the success of on-going relationships. It has even been suggested (Easton 1992), that actually *networks* can be defined *as strongly bonded relationships*. Moreover, the strength of the relationship can be defined as a synonym for *a long-lasting relationship* (Han 1997).

The strength of a relationship is ascertained with the help of structural bonding. Hypothetically, it can be postulated (e.g. Wilson and Jantrania 1997, Holmlund 1997, 242, Han 1997) that actually

the strength of the relationship \cong f (commitment) and
commitment \cong f (bonding).

Further,

commitment = f (social bonding, structural bonding), in which
social bonding = f (satisfaction, trust).

Structural bonding has several antecedents, such as technology, evaluation of alternatives (if not institutionalised/closed nets causing inertia), adaptation, importance of exchange relationship, and environmental uncertainty. Indeed, technology *per se* is one of the most influential attributes for structural bonding, though not the major one. The model for structural bonding emphasises the positive features when a relationship is constructed. Moreover, social bonding is a kind of intervention and a constructive factor between the two fundamentals: trust and commitment. Han (1997) claims that commitment is achieved with strong bonds: *on structural and social level*. Moreover, Wilson and Jantrania (1997, 291) claim that structural bonding is *a richer version of the TCA framework*. Commitment as a term has different aspects; because it is a result of a gradual co-operative process the term can be anchored to the conventional involvement frame having three distinctive steps: cognitive, affective, and conative. In general the steps for deeper involvement can be classified to have attitudinal (affective) and behavioural (conative) dimensions. Certainly, these dimensions are strongly interrelated.

Using the terming by Håkanson and Snehota (1997, 153) the actor bonds connect the actors but also these *'bonds influence how two actors perceive each other and form their identities in relation to each other'*. If so, the perception and identification of the partner's behaviour in the dyad is a natural consequence of this interaction. Hence, this is also the *basis on how the members of the nets perceive the roles*. In addition, activity bonds *become established in interaction and reflect the interaction processes*. When resources and activities affect the firms' identity, it can be noted that the actor bond as a

term is associated with mutual learning process as well (Dubois and Waluszewski 1998, 188). In all, *with the help of the bonds the actors perceive the roles as well* (e.g. cognitive bonds and mutual learning).

As regards the *other tying elements*, *activity links* refer to technical, commercial, and other *activities* of a company which can be connected in different ways. In addition, the activity links are important in how and to what extent the '*adaptation of the firms (...) activity structures has been done*' (Dubois and Waluszewski 1998, 187). As noted above an *activity* is a set of acts, a sequence of them '*directed toward a purpose*' (Håkanson and Snehota 1997, 52). Firms try to actively adapt their activities to the other actor's performance and activities for which these firms have direct relationships. In addition, Håkanson and Snehota (1997) explain *resource ties* as elements that tie both the tangible and intangible resource elements of the dyad. Again, and according to the basic axioms of the network theory, these resources (immaterial or material) are heterogeneous. Furthermore, the *resource ties* are elements that connect various resource elements of two companies (Håkanson and Snehota 1997). Resource ties result from the previous experience the partners have in they relationship. Furthermore, these ties are resources as well.

The following matrix summarises the critical components (adapted from Håkanson and Snehota 1997, 173) and sheds light on the *substance* and *function* of the relationship and the interlinking and intertextual features a network structure might have; the *shaded area* represents the major focus of this thesis.

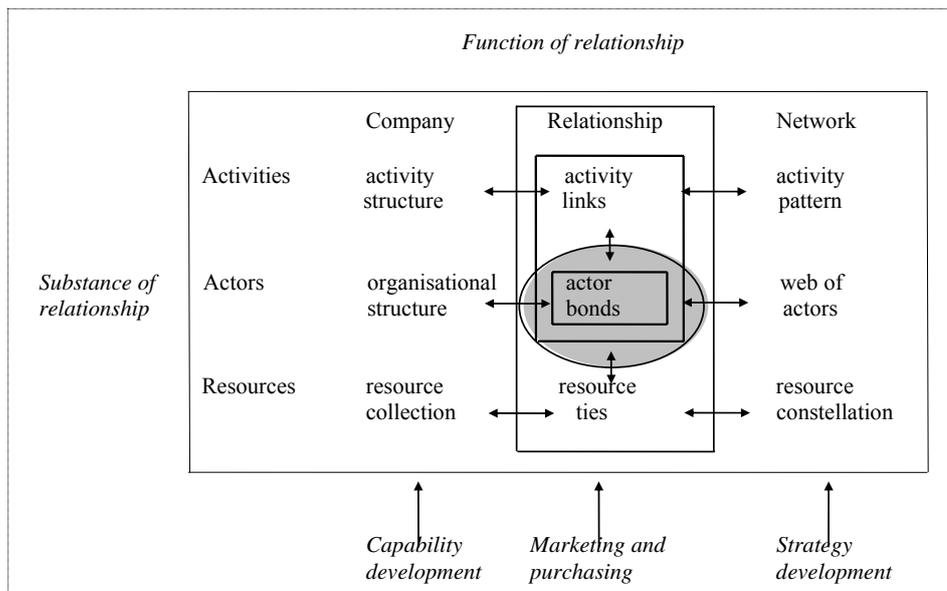


Figure 3.3. The Critical Issues in Relationship Studies with a Scheme of Analysis

In the illustration above the actors are connected with bonds to the web of actors. Because of the fact that activities and resources are interlinked, there are also activity links and resource ties, which also glue an individual actor to the network structure. With respect to the functions of the relationship, a simple classification can be made. The functions can be for an individual company (the focal firm's point of view), for the dyad, or for the third parties in a triadic system. However, in the IMP-based approach the operational term function is predominantly replaced by the terms activity or act; e.g. Grönroos (1997) prefers to use the concept action instead of act for a simplest form of transaction between actors.

Though bonded networks are mainly positively laden and regarded by the actors, some scholars have *suspected the value of strong ties* (e.g. Granovetter 1973). In his view too strong ties (which mean more or less inertia in the cluster of firms) cause problems due to the fact that those nets are not channels for innovation; weak ties (loosely linked nets) more easily enable the actors to provide new insights and procedures in contrast to a strongly bonded network, which is constrained by inertia.

Inertia as an Outcome

With respect to the structural elements of the network, it can be assumed that *inertia* is evident, especially regarding the IM network. Besides, the concept can be valuable in order to understand the concepts of role and position. Indeed, for some of the researchers inertia actually means *unwillingness to change current organisational behaviour*, thus maintain the existing roles (e.g. Ford *et al.* 1998). Inertia as a phenomenon has two main attributes: *external and relational*. In addition, it is possible to define relative structural inertia when internal, intraorganisational forces for resisting the changes are described (Ruef 1997). Easton (1992, 23) claims *that strong bonds, which are quite stable ones, means inertia*. Furthermore, changes in general are coupled with *breaking strong bonds*. Networks are stable but not static. This feature, in which two, even contradictory aspects are coupled and further analysed simultaneously (such like forces of change and forces of stability), tend to be typical for the network-based approach. Within a TCA frame the *inertia is described with hierarchies*: e.g. if there is no competition in the transportation sector, the price competitiveness is of minor importance (Ojala 1995, 219).

Furthermore, the inertia is influenced also by the *openness* (external) and *degree of structural bonding* (internal) of the network. In an open network with less inertia practically no or just a limited number of barriers to entry exist. Penetration is flexible and free for all the actors. In a more closed system, however, several barriers hamper the penetration due to different reasons: strong bonds between the actors might prevent the entrance. Besides, a settled and stable division of activities exist in structurally bonded networks. Activity structures as well as resource ties are established in longer term interaction processes between participants. Ford *et al* (1998) describe that the inertia within a dyad often occurs in *pre-relationship* stage.

3.4. Role

The terms role and position as conceptualisations are associated with the analysis expressing two opposite forces: change and stability (see e.g. Anderson *et al.* 1998). In general, the terms are coupled with network relationships having a past, present, and future. These dualistic terms have a lot of theoretical parallels. Consequently, there is an interplay with them expressing inseparability; '*they are actually different facets of the same phenomenon*' as Halinen (1994, 252) puts it.

A role can be defined as a task that is influenced by both the position of an actor in the network and how he is embedded in it, and more specifically, in nets. The role requires some plausibility in the network; it is thus important how the other members perceive a single actor through the relationships. Regarding the temporal aspect of the concept, and emphasising the presence, a role can be expressed as a duty or a purpose of an actor in a particular activity. In this sense it could be an imperative right now implying an expected pattern of behaviour associated with an assumption or a presumption for the future. More accurately, and considering the future, it can be noted that a role – and more precisely a position – *includes an idea of an expectation, and intention*; e.g. Anderson *et al.* (1998, 172) use the term role '*to express (...) actor activities as (these) emanate from the creation and sense-making process that characterizes each actor's own intentions and interpretations* (comments in parenthesis added by the present author).

In this study, role as a term means a bundle of activities and tasks performed by an actor in IM transportation, influenced by the expectations – generated through and with the help of network relationships – of what is perceived as appropriate (compare to Anderson *et al.* 1998). It is thus an appearance for the network members based strongly on behavioural responses. With the role, an actor is required to accept an adoption of tasks according to an expected pattern of behaviour, while position more often refers to adaptation of tasks because of specific situations, and under different, more dynamical circumstances. Hence, an actor is ready to face a challenge of modified behaviour with respect to the role expectations. Consequently, the role is more a concept for analysing the behavioural aspects in the interaction rather than merely the expectations.

Though role is often associated with the change dimension in network studies (e.g. Anderson *et al.* 1998), it can be assumed that it could also refer to stability: on the basis preliminary discussions with the actors it seems that in the IM network there is a *strong tendency to accept and maintain the existing roles*. Hence, the roles are not just an outcome in a long temporal process because of stable tasks in the network, but because of structures. Bundles of bonds (e.g. social, technological, co-ordination) and bonded structures are an assurance for on-going collaboration within permanent relationships. With the help of steady roles the (pro)actors settle terms for collaboration. Moreover, it is possible to define role switching, which means that in different situations an actor might have different roles. As regards the role of the focal firm, it should be remembered that there is still a *government-erected monopoly*, which means that the focal firm has an exclusive right to maintain railway service on domestic tracks, implying a sole operator case. Consequently, there is an external obligation stipulated by the public authority to cope with certain transportation activities. The actor can change the position through role performance, however. On the other hand, this is

possible only on a limited scope because of the network involvement, e.g. the role of the common carrier does not allow the focal firm to change its position radically.

In the network approach the role conceptualisation describes the dynamic aspects of the position, because scholars tend to underline both the impact of social structures and the processes within them (see e.g. Halinen 1994, Anderson *et al.* 1998). This is due to the fact that these suggestions stem from the role theory and behavioural sciences. However, the power of structural aspects – the strength of the actor bonds – indicates that the other actors (members in the focal net) can influence the behaviour in terms of stipulating the norms for the behaviour, which thus reduces the focal firm's ability to extend the scope of the behavioural responses. Also Havila (1996) claims that actually the role as a concept includes the dynamic aspect of network behaviour. The idea is derived from two distinctive sources: she strongly emphasises the *social structures*, and uses the term to gain some explanatory power for the investigation. Social structures are more vulnerable to apparent changes than e.g. technological ones.

Theoretically, it is assumed that the main roles of the operators are those of *actors*, *reactors*, and *interactors*. Here, actor predominantly means proactive measures in a dyadic relationship. Considering particularly the contractual bond, these can be defined as principals, as is often done in jurisdiction. Because an actor is deeply incorporated in its role, the principal has certain rights and certain opportunities to interpret and judge the situations, and give specific meaning to the events. An actor can also be an initiator. Reactors are more likely to have reactive measures. In practice, they are often called as subcontractors. Hence, they are strongly tied to the counterpart with a contractual bond, and the scope of responses is limited. Furthermore, they have a clear and predicted behavioural pattern, including respective responses. This is required because of the true nature of the relationship: it provides some incentives but includes depressive, harmful and even deleterious elements as well. An interactor can be an integrator: an actor combining the service packages offered by a number of modes, coordinating the activities, or consolidating single consignments. In the transportation business the common carriers are to give a neutral, non-exclusive, and non-restrictive multilateral platform for interactive service production. Hence, the number of relationships is necessarily large. The scope of behavioural activities is presumed to be larger if the role is that of an (pro)actor rather than a reactor who is obliged to accept – at least partly - the stimuli generated by the initiator.

Undoubtedly, and with respect to pragmatics, all the actors tend to have multiactive responses to the proactive measures or the initialised effects, which means that they take, leave, reject, ignore, transfer, or stipulate, while acting, reacting, or transacting. Hence, they are *not* tied to one form of response. Indeed, it is possible to categorise different kinds of actions and reactions when coping with the question of responses in a network; e.g. Easton and Lundgren (1992) define five distinctive sequences: *reflection*, *adaptation*, *absorption*, *transmission*, and *transmutation*. Reflection occurs when an actor is rejecting the changes, while adaptation implies a situation in which change is managed by negotiations in the dyad, not influencing the other members of the network. Absorption is close to adoption as a conceptualisation, since in this response the actor accepts the changes. In the case of transmission, an actor transmits the effects of change to the other members in the web, whereas for transmutation it is typical that the receiving actor adapts the changes but also transmits the changes – and the requirements and obligations as well – to the rest of the network. In general, Easton and Lundgren

(1992) clearly distinguish between responses in a dyad and responses in a net or network context. In this study the main focus is on chosen dyadic relationships, and therefore the network reactions (transmission, transmutation) do not have a prominent role.

Based on the findings on the first stages of the research work, it seems to be necessary to distinguish between two different roles: *roles of the organisations* in the network, and *roles of individual actors representing their organisations in social nets influencing the organisational roles as well*: much of the interorganisational behaviour tends to be rather *interpersonal*, than purely *interorganisational*. This issue will be examined further in the empirical part of the study.

3.5. Position

In addition to role, also the concept of position is one of the major constructs in the network theory. The position has been explained with different attributes like *identity* (Wynstra 1994, 803), *role* (Anderssen *et al.* 1994), *importance* (Wynstra 1994, Halinen 1994, 326), *strength, characteristics and/or portfolio relationships* (Ford *et al.* 1998, 49), or *contribution to network* (Tikkanen 1997, Ghauri and Holstius 1996). In the organisational theory the position is explained with a group of models and respective attributes like *cohesion, equivalence* or *prominence* (Nohria 1992, 6). These concepts, and specially the last mentioned, are close to the role, especially through the norms and expectations (Aastrup 2003, 120). Moreover, position is not an absolute determinant but rather relative, meaning different things for different actors (Halinen 1996).

Consistent with the concept of role, also position is *generated through relationships*. Mattsson and Johanson (1992, 211) postulate that '*each actor is engaged in a number of exchange relationships with other actors. These relationships define the position of the actor in the network; besides, the concept can be used to characterise network structure and network distance between actors*'. Interesting is the question of how the role can change because of new initiatives by operators and incidents caused by external stimuli. Consequently, the tasks and obligations are continuously changing, leading to new positions. Addressing the convergence of the terms it can be claimed that '*the role dimension represents the subjective and creative character of the actor. Moreover, an actor has a position but acts in a role*' (Anderson *et al.* 1998, 172). It seems also that position as a term has dominance over the role in network studies (Halinen 1994). Accordingly, the conceptualisation determines '*to what extent an actor is involved in the (exchange) relationship and how much responsibility it has*' (Halinen 1994, 234). Furthermore, it is an expression of the *breadth of the relationship*, implying a range of activities and behavioural responses.

These two terms can also embrace the dynamical aspects of the network. In this study both position and role can refer to change; a new position can be regarded as an actors' attempt to change, redesign and extend its traditional role. Though the proposal seems to be in contrast with the definitions of e.g. Halinen (1994, 252), it is in close accordance with her explanations, because for her the term role also includes '*the potential to develop and expand the relationship*'. The role includes an option to modify the relationship, which changes the position as well. Moreover, it *sets the limits for the behaviour*. Furthermore, and considering the dynamics, '*dynamics in any one network will be unique relative to other networks*' (Halinen 1994, 252). In other words, the

question of position is in accordance with the idea of context-bound phenomenon. Besides, '*the ability of actors to interpret changes and to create meaning of their own and other actors' network positions and roles, is a primary determinant of their subsequent activities and thereby of the network dynamics*' (Halinen 1994,253).¹

Considering the parallels of both of the role and position, it cannot be denied that a context-bound phenomenon is under consideration. Because of the influence of the structural elements of the network, it is necessary to analyse how the actors are embedded in order to understand the position. The conventional evaluation of how an actor is related to other actors is not proper, since it rejects partly the question of embeddedness and the inherent dimensions. The term position is a valuable expression of proximity. In this sense *the position can be associated with the questions of spatiality with main emphasis on the closeness-remoteness dimension.*

The question of the potential *discrepancy* between terms is interesting, as some scholars tend to define solely the role in order to capture the dynamics along with the suggestion that actually position refers to stability (see e.g. Halinen 1994, Anderson *et al.* 1998). Basically, this dilemma is based on the examination of the major antecedents and prerequisites for analysing the terms. If a position is a reflection of *structures*, and not of the *interaction processes and inherent relationships*, the conceptualisation carries out very strong stable aspects. Theoretically, the question of the major attributes of concept of position concept is interesting. As noted, the primordial question is whether the actors *get* the roles because of their positions (and because of the structural elements in a network) or whether *the roles are created through the interaction processes*. In this study the roles are created through the relationships, but they are also an outcome of the structures, whether these are social or others. The role also includes the limits for the behaviour, while the position is rather an expression of the actors' will, subject to the most appropriate location in the future.

1) Aastrup (2003,89) makes a synthesis of the term according to the *critical realist view* by stating that position is actually associated with *systems*, which consists of *positions* occupied by individuals, and *practices* in which individuals are engaged, in virtue of their positions.

Aastrup (2003, 132) defines network positions as *sensitising concepts*; they are the actors' base for acting *in the network structure*, which means that the question is how an actor relates to the network structures, which *enables and constrains the actor in future activities*. Moreover, in Aastrup's view more interest should be paid to analytical matters, instead of theorising without any practical relevance. The pluralism of terms and differing definitions by the practitioners have to be accepted.¹

From managerial point of view a position is a strategical tool, when a (focal) firm's one or two property/ies, character, or target - e.g. capability, reputation, identity, attractiveness, service quality, productivity, - is related to others; as Mattsson and Johanson (1992, 231) put it '*strategic objectives are defined in terms of network positions*' and '*strategic actions aim at influencing actors, relationships, and network structures*'. Referring to extended conceptualisation of positions, strategic action '*may also aim at restructuring the web of dependencies (in the productions system)*' (ibid., 231). As a result, weakening of dependency and strengthening of interdependencies are evident. Moreover, position means what a single operator *is in relation to others* through the relationships created in interaction. Hence, and to address the managerial approach, it could also refer to a *need for organisational segregation*, and thus to interorganisational proximity: how a firm as an actor distinguishes itself from others in terms of service, product, quality, reputation or identity. In order to maintain the difference and superiority, consistent identity is often required as well as continuous, perpetual analysis and observation for maintaining and protecting the position. Complementarity means a modest distance, whereas compatibility can be a trigger for starting a deeper collaboration. To sum up, *interorganisational location in relation to other actors in the network is defined with the position*. The deeper the relationship, the closer the actors tend to be, which has an impact on their network positions as well.

The position enables the actors to *create strategic solutions*; it can be a critical element in strategic planning, because it gives the focal firm a bundle of attainable locations in the network of relationships. The locations are continuously changing in time, which refers to evolutionary processes in the relationships. Hence, in the networks, in which profound changes occur in a relatively short time, temporal analysis is a prerequisite for the scrutiny. Regarding the evolutionary characteristics of the networks, e.g. the life cycle metaphor has often been employed by researchers when temporal dynamics has been assessed, though several other theories could be more recommendable (Halinen 1996, 65). The strategic performance based on a specified position is evaluated and assessed by another party, including the common historical experience and the future expectations (Håkanson and Snehota 1997).

1) Henders (as cited by Aastrup 2003,106) presents present position (actual position), future position (position as an idealised future state), and position as a process (an idealised state as an expression of strategical will). Inevitably, it is very difficult to separate position and process. For Aastrup structures in this sense represent *a static sphere of reality*; structures determine the ability to act, not the act itself. Moreover, because of the structures the static ingredient is posed, whereas with the process the active dimension is revealed. According to Henders (as cited by Anderson *et al.*1998, 169) the *change* can be described by comparing an actor's position at time t0 and t1.

Further position is often it is *an expression of an actor's will, subject to an ideal organisational location in the network*; that is among the web of relationships. Also, a position can be an expression of an ideal state amidst relationships *manifesting the actor's strive* for repositioning itself, but constrained, however, by e.g. the structures.

Extending the Theoretical Discussion

Mattsson and Johanson (1992) enlarge the theoretical discussion of the position by launching two additional terms, *micro and macro* position. *Micro position* implies the *strength of the relationship with the other firms*. Practically, the more bonds there exist, the less there is remoteness, which means a stronger relationship; hence the argumentation is close to the proposals made by Halinen (1994). The number of bonds can indicate the strength of the relationship, though the real character of a single bond is inevitably more important than the total number of bonds in a dyad. A single bond, like a social one, can maintain the strength of the relationship together with a contractual bond. Hence, an analysis of the strength of the relationship is required.

With the macro position Mattsson and Johanson (1992, 213) mean *'the functions performed by the firm for other firms specially when exceeding the expectations meaning also the relative importance of the firm in the network, and the strength of relationships with other firms.'* Furthermore, it is an expression of the identity of other firms with which the firm has direct and indirect relationships.

Mattsson and Johanson (1992, 212) also give a *limited and extended definition of positions*. For *limited position* they argue as follows:

'a position of an actor is a matter of the exchange relationships of the actor and the identities of the counterparts in those relationships. This corresponds to the way in which positions are used in sociometric network analyses and makes it possible for us to use all the usual measures for characterising network positions: interconnectedness and distance for example. When operationalising the limited definition it is possible to view relationships as integer variables that only take the values zero and one. It is, however, also possible to view relationships as continuous metric variables, defined on the same scale, with values between zero and one depending on the strength of the relationship. Further, relationships may be conceived of as vectors with values depending on the strength of a number of bond dimensions - legal, social, etc.)'

In all, the analytical methods for assessing the distance measure may be appropriate for discussing the position as well. Though vital, sociometric analysis requires sophisticated methods.

An *extended position* can be expressed in the following manner: *'it refers to the role the actors have in the production system. Thus, according to the extended definition, the position of an actor includes also the productive processes - in a broad sense - in which it is involved and it's direct and indirect network interdependencies.'* (Mattsson and Johanson 1992, 214). Aastrup (2003, 125) wraps up this by addressing that actually limited position involves the strength in the exchange relationships, and the extended version involves the function and importance in the production system.

According to Mattsson and Johanson (1992, 231), the qualitative dimension describes which function the actor has in the production system. In a sequential chain linking the separate resources, the individual actor has one or more specific functions, for which the resources it controls are specialised. The quantitative dimension characterises the relative importance that the resources of the actor have in relation to the resources of other actors, i.e. how much of the total quantity of substitutable resource are controlled by the actor. Moreover, the *network position gives an actor some power over resources controlled by other actors*' (Mattsson and Johanson 1992, 232).

The Impact of Power and Trust on Positions

In general, the power of actors in networks is a versatile phenomenon. Depending on the researcher's own perceptions, many explanations on various dimensions of power exist (e.g. social sciences, the neo-classical theories). The analysis of governance structures is more significant in partnering studies due the managerial perspective they have. Power means partly the ability to co-ordinate. From point of view of economics the invisible hand is stressed, though this can be just one of the ways to describe the mechanisms (Easton 1992, 22). Co-ordination is not achieved by some grand master plan (strategic outline for core activities) or quasi hierarchy. The reasons are obvious: the actors are too independent (though interdependence is feasible) and due to the diversity of activities, controlling is very difficult.

According to Thorelli (1986) position is actually a location of power to create and/or influence networks. Accordingly, *a position is dependent upon the power of the actor (company) relative to other participants in the focal network*. More specifically, the critical question is to what extent an individual actor can control the resources and activities of the other actors? The control over resources is an initial point for assessing the *power basis* and furthermore to *means of power* (e.g. activities to influence, threats, promises).

The concept of power is linked to trust as well. Trust is established in a long process between the actors with the help of knowledge of the other actors' activities, experience and similar attributes; it can be even claimed that the governance is based on trust or power. The control mechanism over resources, which is strongly associated with the concept of power, can also be coupled with trust. In this study, trust is included when the bonding mechanism is explained: *a structurally bonded network can be a source of trust*.

Trust has some common dimensions with power, such as confidence, willingness to rely, and expectancy. An applicable definition is offered by Campbell (1998, 23): trust is *'willingness to rely on an exchange partner in whom one has confidence'*. The terms trust and commitment have a range of definitions, not just in network approach but in partnering studies as well, in which it is one of the core components. Occasionally, even the *importance of the relationship* can be added as one of the determinants describing trust (for a review of trust under several disciplines see Blomqvist 1997, or Blomqvist 2002). As noted earlier, trust can be based on diverse bonds as well.

In fact, because position is often a reflection of network structures, the degree of bonding affects the position as well. This means that if there exist strong and well-established bonds between the actors, the positions are quite stable despite of efforts for

change; this seems to be typical for IM chains. Moreover, position changes are strongly interlinked (Wynstra 1994, 804). A residual change in the position can lead to a domino-effect: all the actors in the net have to react by means of adaptation caused primordially e.g. by an external stimulus or other critical incident.

The legal obligations by means of agreements define the amount of so called formal-legal power (Hertz 1992, 107, 108). Besides, the ownership (when a legal entity is a subsidiary of some other enterprise) is a strong tool for using power. For Easton (1992) the most probable form of co-ordination is not just a market or hierarchy but also any kind of intermediate form. Briefly, *'the direction of change is governed by the pattern of relationship that the participants judge'* (Easton 1992, 34). Easton is of the opinion that scattered resources can be one of the reasons for unequal distribution of power. As an implication, asymmetrical relationships occur with respect to power; the power concept encapsulates two contradictory characteristics – competition and co-operation, which are void in the relationship. Under competition firms want more to make decisions about the control over their own resources, whereas in the co-operative stage the partners want to share the power and respective resources by means of joint planning. It is important that firms prioritise their activities: the development of strong ties with important counterparts is a necessity. Pragmatically, a firm can create coalitions, or industrial blocks, or even conflicting acts (Håkanson 1992, 140).

Empirical Verification and Dualism

Regarding the practical verification, it is a challenging task for the researcher to analyse the term position comprehensively. As Aastrup (2003, 122) puts it *'(...) the concept of position may involve several underlying dimensions (i.e. resources and resource dependencies as well as expectations and roles) making it hard to define the concept in operational terms.'* Moreover, instead of aiming to explain the term/s attention should be paid on other interests: *'it makes more sense to ask what the concept of network position directs our attention to and what operative phenomena to measure, identify or explore network positions through'* (Aastrup 2003, 130). Though the additional components mentioned (micro and macro; limited and extended) enrich the theoretical discussion, analytically *these proposals as extensions do not contribute substantially to the research work by giving totally new mindsets, either* (see also e.g. Aastrup 2003, Halinen 1994, Andersson *et al.* 1998). Hence, the relevance of modified terms is modest in the empirical investigation (compare, though, table 7.1).

Finally, and because of the fact that the role and position are different facets of the same phenomenon, it has to be accepted that there is *an interplay and dualistic interdependency between the concepts*. In other words, an attempt should be made to break the established setting in which there are two major explanatory chains for the definitions: role–processes–dynamic dimension vs. position–structures–stabilising dimensions. Indeed, Anderson *et al.* (1998, 184) have even created a combined construct – *position-and-role*. Based on an illustrative case they postulate that *'position (is) encapsulated through expectations (...) and role, including (...) intentions, interplay and mutually create the dynamics in business networks'* (comments in parenthesis added by the present writer). What comes to roles, in this study the structural perspective is probably prominent when analysing the behaviour: the roles are perceived and defined by the operators of the focal net and they are thus consistent with the

expectations. Hence, the dynamical aspects of the role behaviour are not manifested as strongly as some others do when they refer to position and when they discuss the stable determinants: e.g. Anderson *et al.* (1998) aim to grasp the subjective and *process-oriented character* of the actor's creative nature when exploring the role.

The question of accepting expectations can be associated with the major theoretical roles as well. Typical responses of the reactor are those which take place after activities initiated by the other counterparts. The role of a (pro)actor is more subject to own attempts and will. Figure 3.4 illustrates the dualistic nature and the interplay between these two concepts.

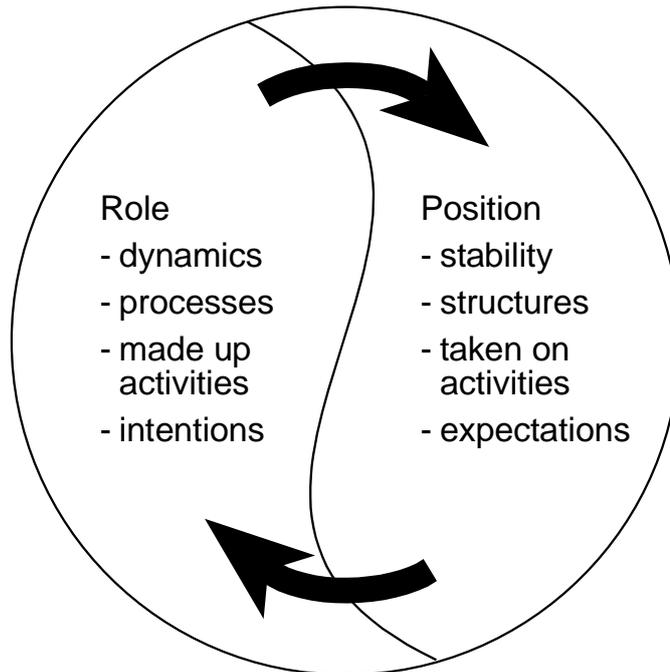


Figure 3.4 The Bipolarism of the Role-Position Concept

Expectations can be internal, generated by the focal firm alone in terms of their own urge. They can be *collective* as well, which means that they are common expressions of the network operators for certain kinds of behaviour. In this study the examination relies mainly on the dualistic nature of the double concepts.

4. Managerial View for Explaining Networks

This chapter 4 describes the primary features of the supply chain management as a theoretical proposal for describing the networks. Prior to this the role of transaction cost analysis is explored. This is necessary because this theory gives a theoretical and philosophical background for the strategic and managerial view by expressing the formation of an ideal relationship type for a particular company. Then the major features of SCM are presented, including how the relationships are described. The spatial features of the network analysis are also presented by introducing the spatial considerations, which are fundamental in network research. Again, it is necessary to distinguish between the managerial view and its concrete description of locations in contrast to the IMP-based view, which deals with the cognitive distances and organisational proximity. As noted in subchapter 3.5., the position of the company is strongly dependent on these distance measures and the closeness-remoteness dimension. Finally, in subchapter 4.4. some primary limitations of the SCM-based approach are presented by explaining the intermodalism.

4.1. Interorganisational Behaviour and Transaction Cost Analysis

The Interorganisational Relationships- (IOR) approach is widely utilised in business economics mainly in explaining the formation of co-operative arrangements. In numerous studies IOR as a term is a reflection of joint ventures, M&A's, and even licence agreements (Stuart 1997, 539). Hence, the scope of IOR is broader than the non-equity based arrangements which are under consideration in this study. The primary methodology in these studies has been the Transaction Cost Analysis (TCA) drafted initially by Coase (1937), further developed by Williamson (1985, 1986, 1990, and 1991) and later modified by many scholars. The earlier foundations by Coase (1937) give a solid basis for understanding and analysing the classical *make-or-buy dilemma* in firms. Despite of their theoretical nature, the modifications of Williamson include the operationalisation of the transaction cost concept in an attempt to make it more suitable for empirical analysis. Williamson claims (1986, 176) that basically transaction costs '*are the economic equivalent of friction in a physical system*'. Accordingly, the friction is parallel to impedance, which means that the term is close to the distance attribute.

From a managerial (explaining partnerships) point of view *TCA is one of the most adequate theoretical methods for assessing the rationales and mechanisms for interorganisational behaviour*. In network thinking, however, the role is not so dominating as the theory approaches the subjectivist's worldview. More valuable for the purpose of this study is that in transaction analysis the details of governance structures and human actors are brought under review (Williamson 1991, 91). This entails a microlevel side to empirical analysis or - as Williamson calls it - microanalytics.

There exist two forms of governance structures: *markets* and *hierarchies* added with a complementary form, *hybrid*. Hierarchies allow better adaptation than contracting, which is a cornerstone in transactions. As Argyres and Porter Liebeskind (1999,50) point out '*efficiency considerations often require adjustments*' in order to enrich the relationship with shared gains and benefits. In their view adjustments are more likely to

occur within a hierarchy (a firm) than through contracting, at least when costs are considered. Besides, *long term contracts* with external parties *are assets* in a similar way internal contracts with employees, managers, or shareholders. Certainly the question of the term *markets or market* is essential in the network-based thinking though this discussion is mainly beyond the scope of this research work. The manifestation *markets-as-networks*, which link the TCA ideology to the network tenet, is mainly applicable, although it can be claimed that *networking* is between *markets and hierarchies*. Market as term has various meanings: the conventional view emphasises the space and place surrounded by some institutional rules, constraints and other mechanisms. In this sense the market as a term is close to context, though more normative in nature. Furthermore, markets can be an outcome of the actions of actors; this *behavioural aspect* is stressed by Snehota (1990). *Markets* can be defined as *exchange systems* (Snehota 1990) or simply as *systems*. An optional way to distinguish between markets and networks is to employ two additional determinants: *independency* among actors, which is typical for a classical market situation with the invisible hand as a steering force, or *dependency* (interdependence) which is relevant in co-operative business networks (see e.g. Garnes 1994, 530).

There are two kinds of contractual commitments in the TCA model: on intraorganisational level with the staff and on interorganisational level with counterparts. The contract *per se* is described in various ways including issues such like planning, promise, competition, and governance (or private ordering; Williamson 1986, 177). It seems that contract or contractual represent something more general, uniform, and mechanical for Williamson. Thus, the Transaction Cost Economics (TCE) approach is applicable to all the situations which can be posed - directly or indirectly - as a contracting problem (Williamson 1986, 187). It has been argued that all business relationships are contractual - implicitly or explicitly. This implies that relational is a consequence of contractual - a view that is strongly stressed in the theory of Williamson. Besides, there could be two alternative aspects of interorganisational relationships - contractual arrangements and a relational mechanism (Cheung and Turnbull 1998, 51). Contractual has different connotations: in the broadest sense numerous features in interorganisational behaviour can be classified as contractual. In a limited sense, however, contractual refers to contractual arrangements - to the economic and legal base of a relationship. In Williamson's view issues like planning or even competition are meanings of the contractual. Vertical integration is one of the diverse applications of TCE/TCA. It should be noted that though vertical integration - and interorganisational relationships as well - are of the main interest, the TCA approach has benefited the analysis of horizontal interorganisational relationships as well (Rindfleisch and Heide 1997).

The relevance of TCA has been tested and identified among service providers with asset-specificity, bounded rationality, and opportunism as the main components (Ojala 1995, Andersson 1997) or by evaluating the appropriate cost measure for vertical exchange process among railway companies (Jensen 1998). Ojala (1995) depicts the governance structures among TPLs in Finland with markets or hierarchies as determining variables. For a research it is a bit problematic to decide whether a service provider and a shipper are at the same point in the value chain: most scholars claim that they are not. However, there is evidence that they are actually at the same point; if so, they are horizontally integrated, not vertically. This point is valuable for this thesis as well, as service providers in a focal net are organised both horizontally and vertically.

Ojala (1995) has examined markets and hierarchies among Finnish service providers. According to him, the market is linked with the TCA approach, meaning an arm's length transaction relationship between a buyer and seller, which is thus parallel to the arm's length partnership as explained in supply chain based analysis. For Ojala transaction may be recurrent (e.g. annual transport contract) or occasional (e.g. tariff-based ad hoc shipment; op.cit., 155). It can be argued that a short term notion - a transactional ad hoc shipment with stable tariffs and no discounts - will be replaced by *retention relationships* in the long run; from the service provider's point of view this also implies the use of discounts and rebates for loyalty. Regarding vertical integration, Ojala found out that it has been a trend for years though the *integration is not general* but more *firm-specific* (equity-based relationships are excluded in this analysis). This implies that many of the antecedents describing the relationships between shippers, service providers (e.g. port operators, stevedoring business) are predominantly M&A's, takeovers, or similar strategic, equity-based transactions. On the other hand in shipping industry the co-operative arrangements have long traditions but are described by different means than in landborne business: the formation of pools, cartels, and consortiums (Ojala 1995) or liner conferences are even settled conventions in the global market place.

Furthermore, in the TCA- based approach, the *exchange* is a *fundament* in a similar way as it is an essential determinant in contemporary marketing or in explaining interorganisational behaviour. The exchange within TCA frames can be associated with exchange relationships, which are the main points of interest in relationship studies as well; that is in the network tenet in which markets are viewed as network structures (Snehota 1990). On the other hand, some scholars are of the opinion that there is a difference between markets and networks: a network has less clear boundaries than a market structure (Mattsson and Johanson 1992, 211).

The TCA approach is employed in the present study as it can be hypothesised that due to asset specificity and the experience the partners have there has to be long term transactional features in the business network: idiosyncratic, specific transactions in the long run. The forms of integration represent - at least implicitly - long term commitments between the parties. Problematic is, however, that in the network analysis both vertical and horizontal forms should be (and will be) considered, as well as the non-business relationships which are unquestionably not considered in TCA thinking in such an exhaustive way.

4.2. Supply Chains as Network Structures

During the last decades the ideology behind *Supply Chain Management* (SCM) and related terms like *supply chain* (SC) or even *supply chain integration* (SCI) have made a strong penetration to research in logistics. It can be noted that it is now the most important concept in logistic studies (Nikkanen and Lukka 1999, 23). However, instead of using the term *supply chain* the word *demand* should be underlined to pay attention to the customer-oriented and market-oriented view of logistics. Despite of some critical notes (e.g. Stabell and Fjeldstad 1998), the theory constructed to support value chain thinking is still the leading framework when the features creating competitive advantage in rivalry are explored.

Logistics researchers have depicted the chain in different ways. The supply chain as a concept has two main connotations: in the narrowest sense the word denotes a chain of activities from the supplier to the final customer. Recently, however, the concept has mainly been used in a broader context: it is depicted as a *facility network* (Dornier *et al.* 1998), *facilitating networks* (Cavinato 1999), *physical network*, *network of flows of objects* (Berglund 1997), *supply network* (Spens 1998), *chain network* (Tuimala and Lukka 1999), or *supply chain networks* (Lukka and Lensu 1997). This means that SC has recently more depicted as a *network structure* than a *chain* or as Berglund (1997) states a supply chain is '*a simplification of the network*'. To highlight the SCI, a proposal by Berglund (1997) is a typical example of how the new structure has been identified. Berglund (1997, 23) defines SCI as '*the change process, or the activities and resources, for integrating the individually governed entities of SC in order to achieve or perform SCM*'.

SCM as a concept describes some of the managerial aspects of the chains: the control, co-ordination and governance functions, as well as the integrative actions needed to ensure optimal performance. In this sense *integrative processes are needed to strengthen the established relationships*; this is close to the bonding mechanisms as explained in the IMP-based network tenet.

Regardless of the similarities between the two different models, a lot of differences still remain, especially when the *metatheoretical ideas are under consideration*. Supply network and SCI as models are still more managerial views for logistics and transportation than networking theories, especially if the theory that is applied is an IMP- based/industrial network explanation.

Recently, however, in logistics science Cavinato (1999) has described the supply based- network thinking as a next step in the logistics theory, which means that the managerial supply chain architecture *could be one stage in the evolution process for a newer, network based philosophy*. For this reason he claims that relationships are more explained as *transitional* in managerial supply chain model compared to *transcendental*, which is more typical for networks.

Primary Characteristics of SCM

In the following, the main features of managerial SCM thinking are listed (Cooper and Ellram 1993, Stabell and Fjeldstad 1998, Cooper *et al.* 1997, Mentzer *et al.* 2001).

First, SCM is still a *ruling conceptualisation in modern logistics thinking* and it has maintained its paradigmatic position in analysis, even though more interest has been shown on network-type of articulation. It can be suggested that many of the features of the theory will be transferred to the newer models, including the *adequate theoretical underpinnings*.

Second, according to most definitions, *SCM is rather an integrative philosophy taking a systems approach to controlling and managing the supply chain functions from the supplier to the end-user* and addressing the importance of both the *need for integration of processes* and the *value added functions* in logistics. The focal point in SCM (and

SCI) is the *highest managerial level*, underlining the executive level's contribution to development.¹

Third, competition is more and more *between chains* and related companies - not between single *companies*. Members of the chain are more conscious of the fact that there is just one source of income for the whole chain. Moreover, SCM thinking is based on the assumption that there is often *one key player or a leader having dominance over the others*.

Fourth, in theory the main concern is on *activities* - the core and supportive ones - as identified in value chains. One of the primary questions is what is their impact on cost and value? Furthermore, *optimisation* of activities (e.g. cost reduction, better customer service, increased productivity) can be achieved *with co-operation* among operators; otherwise suboptimization occurs. Then the costs are transferred rather than removed from one partner to another (Burgess 1998, 16). One of the objectives is to find *channel-wide costs efficiencies*. A total cost approach often means the minimisation of the operator's own costs on the functional level. Furthermore, each member affects the others in the chain either directly or indirectly. In the broadest sense, supply chain integration means gradual formation of co-operation from the arms' length model to vertical integration, emphasising the need to create long-term relationships: Upstream and downstream integration with non-contractual co-operation is critical in the pipeline. *Joint planning* is one of the key factors in co-operation, and transaction-based practices are replaced by on-going activities.

Fifth, considering the time horizon, the members tend to move from annual or even daily co-operation to *longer-lasting strategic planning according to APDIC- model*. The implementation of SCM also always requires some form of business process reengineering in the long run between the partners: tying up the chain members' needs tools; besides contracts but also trust and commitment. However, the *SCM model still relies on the use of contracts and co-ordination rather than addresses the importance of adaptation and exchange*. The fact that the *organic decision making* can be an appropriate model for describing the reality can not be denied.

1) One of the major constructs in SCM is actually process-based thinking: the concept itself means mainly an integration of several business processes in order to add value to customers. In this sense some of the current logistical trends are mixed on the conceptual level: SCM manifests for processes parallel to Business Process Re-engineering (BPR; for a detailed, even critical analysis for differentials and similarities see e.g. Burgess 1998, 16). The processual view is exhaustively discussed in the network approach as well (see e.g. Tikkanen 1998, 211–214; also Pettigrew 1998).

Though it is assumed that the network perspective will affect the supply chain approach more, the basic construct will keep its position in the near future. It seems that parallel terms – chain, network, and system - are associated with each other and often used interchangeably (Berglund 1997, 23 footnote) despite of the remarkable theoretical differences. This implies that it is extremely difficult to combine or incorporate two quite a different views though e.g. in classical, analytical, and operational logistics science the use of conventional infrastructural network analysis has been a common practice. The supply chains as facility networks are created to model the movement of goods and information with downstream and upstream activities. In the networking ideology, however, a broader meaning for activities is given: e.g. aspects of social behaviour are emphasised.

Regarding partnerships in SCM, Cooper and Ellram (1993) claim that a supply chain needs a leader: a chain is dominated by one organisation and the strategic level is responsible for the main managerial activities. On the other hand some scholars disagree with them; e.g. Lumsden *et al.* (1998, 160) stress logistical decision making on lower levels as well. Nevertheless, the writers are of the opinion, that still numerous, even fundamental questions still arise such as ‘*How many levels of management are involved in interfirm activities ?*‘ The proposed levels are strategic, tactical, and operational. In this sense the SCM approach is in contrast with network thinking in which the decision-making *on multiple managerial levels* is addressed.

Value Creation Process

In SCM-based modelling VAL (Value Added Logistics) thinking is anchored to facility structure. For this reason the chain structure has features like *quasi-vertical* integration (Dornier *et al.* 1998) or *virtual integration* (van Hoek 1998) in order to ensure the implementation of VAL. However, the *value creation logic* in these two distinctive but converging frames is different. The VAL ideology has tangents with Supply Chain Management in many ways. Postponed manufacturing is one of the leading ideas in VAL: in short the *value is added as late as possible*. Generally speaking, there exists a *postponement principle* which determines ‘*the degree to which activities in the chain are postponed*‘ (Jahre 1995, 46). This implies that activities are delayed until actual customers orders have been received (van Hoek 1998, 510). The aspects mentioned have a straight implication: *the VAL/postponement philosophy as a conceptualisation includes possible strategic benefits, opportunities, and challenges for the region* (\approx a local net) that is considered.¹

1) Principally, two basic types of postponement can be classified: *time* postponement (production and assembly) and *place* (geographical) postponement. According to the first term, many activities are delayed as long as possible. In the place type of postponement the goods are moved as far as possible before an order is received from a customer. In addition, *form* postponement can be defined; the term denotes a situation in which the actual making of the product is delayed (Dornier *et al.* 1998, 255, Bowersox and Closs 1996).

The combining these basic activities is evident in many situations. The form postponement can be coupled with a place type of postponement. The motives for using postponed manufacturing are many: raising the degree of postponement means reduced risks for the seller or the shipper. Added with new types of terminals containing assembly, labelling, and packaging functions, higher customer service is achieved through customisation. From the shipper's point of view, the utilisation of VAL requires a reconstruction of the current network of terminals, hubs and warehouses by means of geographical relocation.

By exploring the place type of postponement, the spatial aspects are more exhaustively included in VAL thinking. Within VAL frames the *main spatial consideration is to locate the different manufacturing facilities to certain places*. This implies that the managerial view emphasises the objective or subjective distance measure between operators. The network in focus, a concrete and a real one, and the proximity are based on conventional geographical thinking with ordinary distance measure. Moreover, the analysis is based on location theory.

The value creation in the supply chain ideology addresses production and related, mainly functional issues. Under the *network frame*, however, the *value is created through relationships and through various, partly identified dimensions a relationship might have*. In this sense a relationship *per se* has value. Moreover, in a simple form it is a tool for achieving the targeted results. Besides, the relationship has a strong inter- and intraorganisational connotation or as Stabell and Fjeldstad (1998,415) claim, in chains value is created as a *transformation of inputs into products*; in a network, however, the value is created *through linking customers to closer relationships and managing these resources properly*. As noted, the processes needed to create value are diverse: besides the adaptation process, also exchange and co-ordination are of major importance. In addition interorganisational learning, which is one of the fundamentals in strategic outlining, can be a vital construct. Also dependency and commitment are aspects and means for value creation. It can be hypothesised that a *tightly linked network* is both a *prerequisite* and a *catalyst* for value adding because several indispensable processes - adaptation and co-ordination - are possible only if the proximity between the net operators is short indicating strength of a network.

It seems that slight convergence between the chain and general network ideology exists when strategical issues are considered. It has been claimed (e.g. van Hoek 1998) and recommended that in postponed manufacturing the implementation of VAL/postponed manufacturing requires *high degree of interaction, direct contacts and well-catered customer relationship* (van Hoek 1998, 522).

Extended Supply Chain

Defining the SC as above, a one-way flow *for profits* is conceptualised (Berglund 1997). Adding the environmentally responsible logistics concept, reverse logistics can be expressed (Wu and Dunn 1995, 24), exposing also the *reverse side effects* (the feedback for intermodal transportation freight and consequences of the activities involved) of the entire logistics system. A lot of environmental practices can be listed to this opposite-direction flow: reducing, substituting, reusing, and recycling among others. This means that *the role of other than non-business actors is more widely accepted in SC thinking not in the same intensity as in the network tenet*. Also, the

aspirations amidst the members can be other than just profits (or higher productivity, or a similar quantitative measure, mutual urge for deeper collaboration), as *presumed in SCM thinking*. Considering intermodalism as a function, it has been argued that the transition from conventional modes of transportation to multimodal freight can be a signal from a shipper's or consignee's side to chase more mature and generally acceptable solutions actively, indicating a more positive attitude towards environmental issues (see e.g. Baghci and Virum 1996, Burkhardt 1998).

Besides environmental, also other features have been added to complement the traditional supply chain architecture, especially if the strategic pipeline is expressed *in stakeholders' terms*; the stakeholder intervention is based on four principles (Freeman and Liedtka 1997, 287-288):

- the principle of *stakeholder co-operation*: value is created because stakeholders can jointly satisfy their needs and desires - without support from the stakeholder's side no sustaining business can evolve; this is especially true with public and semi-public organisations as stakeholders. Eventhough some scholars (e.g. Frybourg and Nijkamp 1998, 18) claim that the '*role of the public actor is declining and the importance of private operators is rising*' it can be suggested - in a similar way that Freeman and Liedtka (1997) - that the role of this public actor will *change* towards that of a *facilitator* rather than of a traditional inspector. As a consequence, the role can be even more remarkable especially when rivalry between nets is considered.
- the principle of *complexity*: human actors can have different values - economic maximisers are a part of them.
- the principle of *continuous creation*: business as an institution is a source of value creation - this implies human personal growth through collaborative existence.
- the principle of *emergent competition*: competition emerges from a relatively free and democratic society.

To wrap up the principles, it can be claimed that the ethical questions are of major interest in the near future. In addition, the following table can be presented on the basis of these principles to compare the differences between a simple chain and an extended one.

Table 4.1 Extending the Traditional Supply Chain Structure

The traditional view	The emerging view
physical	virtual
product-focused	capability- focused
intrafirm	interfirm
static and fixed	evolving
linear and sequential industry	matrixed and simultaneous ecosystem

In the model of Freeman and Liedtka (1997), virtual is connected to information in a similar way as communication in many others. Despite of the strong chain basis, the illustration by Freeman and Liedtka is valuable for *two* reasons: *First*, it gives a solid frame for *stakeholder's intervention in the chain* by stressing the positive features this kind of actions can have. It could be even manifested that successive chain performance requires even *stronger intervention from all the stakeholders' side*. *Second*, the presentation emphasises the role of the ecosystem. As an implication, it can be noted that both environment (referring to stakeholders) and environmentalism should be embedded in the chain analysis. To sum up, extensions for a supply chain structure and a network-like shape do not necessarily mean that the SC- model can be classified in different way. The picture has been created mainly for strategic purposes, and the critical issue is managing and controlling the extended chain.

4.2.1. Relationships in Supply Chains

One of the fundamental findings in many studies regarding the supply chain functions, or transportation industry in general, is the value *and need for co-operation* (the range of forms) between operators in order to improve *productivity* and to *meet customer requirements better* (see e.g. Fainsilber *et al.* 1993, 59-60). It can be stated that a fluent pipeline with upstream activities *explicitly* requires a high degree of co-operation from the parties involved. The path from co-operation to partnering is evident, as stronger commitment is needed in order to achieve better results. The *partnership explanation* or alliance economy emphasises *the relational aspects in a strategically governed supply chain*; it can be claimed that a supply chain is a construct of relationships, though the intensity of stressing the relationships is not as exhaustive as in the network tenet. In addition, the interfirm aspects will probably be more stressed in the near future (compare to the emerging views discussed by Freeman and Liedtka 1997). Partnership as form of coalition in general can be characterised as a (Lambert *et al.* 1998, 2)

'tailored business relationship based on mutual trust, openness, shared risk, and shared rewards that yields a competitive advantage, resulting in business performance greater than would be achieved by the firms individually'.

Using the concepts and ideas of the interaction approach, Wilson and Jantrania (1997, 289) describe the partnership (or an alliance) as a:

'relationship where a synergistic combination of individual and mutual goals encourages the partners to invest time, effort and resources to create a long term collaborative effort that achieves individual and partnership strategic advantage'.

The definition offered by Wilson and Jantrania (1997) emphasises details that are typical for more genuine partnership type of studies: in both of the definition *strategic* or *competitive advantage* is underlined. In addition, the *synergistic features* are addressed. The core of both these definitions is precisely the same: partnership is a relationship, but the nature of this relationship differs slightly. In partnering studies the relationship is a tying element in transactions; in short term, single transactions create and generate more willingness to co-operate more deeply. It is *a result than a notice of mutual development*. In the interaction approach the analysis is predominantly based on the study of the strength of the relationships. The relationship is generated through

collaborative interaction on *voluntaristic* - and more importantly - *equal and mutual basis*. In contrast to partnership models, the *actor-actor- type of behaviour is thus underlined*.

The more strategic and managerial partnership perspective reflects more an *actor-reactor- scheme* derived from the stimulus-response- frame. In general, in partnership studies asymmetrical relationships are explained, whereas in the interaction approach more symmetrical relationships are typical, at least in a theoretical sense. Besides, the relationships in partnerships have different dimensions: the relationships between firms can be either *horizontal or vertical* or, and what is the most typical situation, *both*. In accordance with the ideas of the network view Gulati (1998, 293) states that an alliance is '*a voluntary arrangement between firms involving exchange (...). They can (...) occur across vertical and horizontal boundaries*'. Besides, he does not distinguish between partnership and alliance as terms.

Partnerships as Outcomes

Of *partnership type of arrangements* as outcomes, some represent a continuum of options (see e.g. Tuimala 2000), whereas others name certain types of partnerships to clarify the essentials of each partnership style (e.g. Mentzer *et al.* 2001). The formation is more clearly expressed from a simple arm's length model to more full integration with the help of distinctive stages. The most typical type of relationship is a manufacturer-service provider or supplier-buyer- relationship; in many of the studies regarding some other form of dyad, results from seller-buyer relationships are generalised (see e.g. Tuimala 2000). Bask (1998) illustrates two basic terms for partnerships: the partnership- mode (long-lasting) and transactional mode (short). It has even been suggested that the terms *RM* and *strategic partnerships* are *synonyms* (Äijö 1996, 14). It is noteworthy that *the partnership studies explain a strong relationship as a result in the strategic decision making procedure, which is based on rational, in-depth analysis of the risks and rewards*. Hence, it is not a question of notation made afterwards.

The difference between the terms alliance and partnership is not unambiguous: some scholars claim that alliance is the final stage of a deeper form of co-operation on the vertical level, whereas others suggest that alliance is a partnership arrangement on the horizontal level and partnership on the vertical one. It is also possible to distinguish the terms by concentrating on core competence: partnership is a collaborative arrangement between parties who have different core competencies. In alliance, though, the parties involved have similar, non-complementing core competencies.

4.3. Spatial Concerns

As regards the themes *space, spatial, or spatial embeddedness*, it has been suggested that these dimensions of reality are some of the *most remarkable* - even ontological - in network studies, though less explicated in many models (e.g. Törnroos *et al.* 1995, Oinas 1999, Halinen and Törnroos 1998). Theoretically, it is very difficult, even impossible, to discuss the network-related issues without spatial considerations, especially when infrastructural networks are scrutinised. As Frybourg and Nijkamp (1998, 16) point out '*network has a geographic meaning and covers a given area*'. Furthermore, this implies that there is '*no network without territory and no territory*

without network'. Furthermore, when analysing how a single actor is embedded in surroundings, the question of *spatial embeddedness* should be viewed as well (Halinen and Törnroos 1998, Oinas 1998). Furthermore, it is very difficult to discuss the roles and positions without paying attention to the closeness-remoteness aspect *reflecting the dimensions of organisational proximity*.

The role of space and geographical dimensions in general is natural, and inherent in logistical thinking though *per se* not a major item of interest in related studies. In infrastructural networks spatiality is often implicitly expressed in the models; some researchers even claim that the space is nearly ignored in advanced research work (Törnroos *et al.* 1995). The following illustration depicts the interconnected elements of the logistics theory.

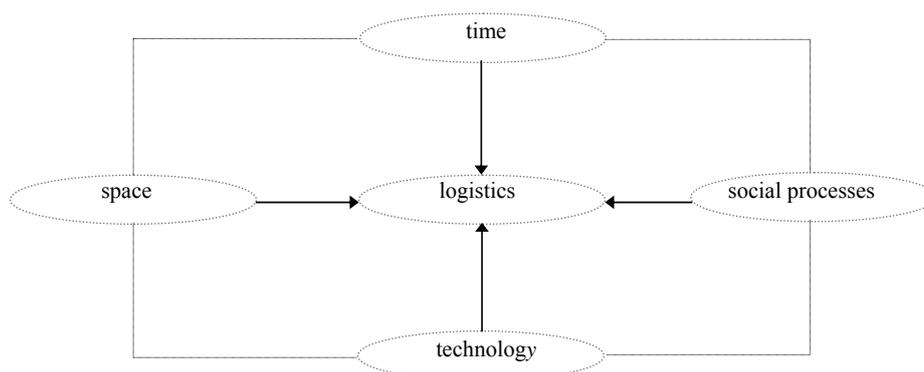


Figure 4.1 Core Concepts of Logistics Theory and Practice

Two of the major concepts - space and time - are even ontological in nature. Also the social processes as crucial elements are identified. When operationalising the *space* element, the following items can be derived (Törnroos *et al.* 1995)

- location,
- spatial interaction and the distance factor in the interfirm context, and
- the firm-environment interface.

Unlike in logistics, the spatio-temporal dimensions are widely contemplated in modern geography (see e.g. Oinas 1998). On the other hand, Castells (1996, 376) hypothesises that actually *space organises time in a network society*. This statement assumes the domination of space by time. Unquestionably Castells is interested in the social meaning of time analysed with the help of social theories rather than geographical or logistical models; in this sense the proposals are consistent with ideas investigated in this thesis. For Castells (1996, 410) space is the expression, not a reflection of a networked society. For him spatial forms and processes are formed by the dynamics of the overall social structure or social processes. Furthermore, '*space is crystallised time*' (Castells 1996, 411). With respect to the infrastructural network, some implications can be listed (Törnroos *et al.* 1995, 21) to name:

- making the present system work more efficiently in space,
- changing the space through new infrastructural investments to serve logistics needs better, and
- co-operating with other firms to manage and organise the geography of logistics more efficiently.

The major objective of the geographical aspects in logistics research is to find a *correlation between interaction and distance* using adequate variables. In infrastructural networks it is important to evaluate the *interaction between the nodes* by utilising interaction models. The models often deal with two distinctive levels: either individuals (disaggregate level) or groups of people (aggregate level) are under consideration. Recently, however, more attention has been paid to disaggregate cognitive spatial choice with detailed description of the decision-making of individuals. An obstacle for intensive in-depth studies is the non-rationality of the reactors, however.

4.3.1 Spatial Interaction

When explaining *spatial interaction*, gravity models are the mostly applied. These models are analogies to the common Newtonian theory of interaction. The analysis is typical on the aggregate level with strong descriptive expression. Some attempts have been made to increase the explanation power of these models, but they are still more predictive than explanatory - actually these models do not tell much about the motives and reasons beyond the interaction (Marjanen 1997). One of the obstacles in the aggregate correlations is that they express predominantly statistical probabilities and random distributions for behaviour.

A general correlation for spatial interaction is the following (Sen and Smith 1995; Fotheringham and O'Kelly 1989):

$$T_{ij} = G (w_i P_i)^\theta (w_j P_j)^\phi / d_{ij}^\delta \quad \text{where} \quad (4.1.)$$

T_{ij} = total spatial interaction between points i and j measured by means of flow from point i to j ,

P_i = size (the population /the mass variable/the attractiveness /the attraction) of point i ,

P_j = size of point j ,

w_i, w_j = parameters reflecting the heterogeneity of masses (e.g. the population); similar to classical Newtonian hypothesis,

d_{ij} = distance between points i and j indicating spatial segregation

G = gravity coefficient (the gravitational constant - mainly the demographic constant), and

θ, ϕ and δ are parameters - statistically estimated - for which $\theta, \phi,$ and $\delta > 0$. In the classical model for $\delta = 2$.

Scholars mostly define total interaction as the flow between two points that are scrutinised - between i and j (e.g. Fotheringham and O'Kelly 1989). In the gravity models the distance measure should be quantifiable - that is measurable in some unitary, mainly physical units. For this reason e.g. Sen and Smith (1995) criticise the use of more cognitive, attitudinal, and social distance measures because they are based on qualitative evaluations among actors - they are *ordinal* in nature, as Sen and Smith claim. They argue that since the classical gravity type of expression as a functional relation '*cannot possibly hold for all ordinal transformations of such distances*, (e.g.

social distance) *between population centres i and j*, (which can be in more general relation more context-specified, and flexible: in general the mass component) *this model would fail to have any empirical content whatsoever* (op.cit. 20; the comments in parenthesis by the present author).

To be more reductionist, it is supposed that the distance decay function *per se* summarises all the effects of spatial interaction. The following correlation highlights the *power deterrence function* (Sen and Smith 1995, 4; also Martellato *et al.* 1998). The decay function is as follows:

$$F(d_{ij}) = (d_{ij})^{-\delta}, \text{ in which} \quad (4.2.)$$

F_{ij} = is the intensity of attraction and
 d_{ij} = distance measure (time/cost)

Moreover, the basic Newtonian model is modified with the following determinants:

- the size factor, typically measured in terms of mass in the gravity models is replaced with the *attraction of a particular point* defined in terms of personal beliefs, values, preferences, and other adequate determinants of behaviour; these variables are context-specified and elaborate the situational features at one temporal point, and
- the distance is defined with some appropriate distance measure.

When configuring the basic model, the following hypothetical relation can be written:

$$T_{ij} = \sum_{i=1}^n (w_i C_{ij}) / d_{ij}, \text{ where} \quad (4.3.)$$

T_{ij} = spatial interaction between points i and j ,
 w_i = the proportional importance of factor in decision makers preferences at the point i ,
 C_{ij} = the preference/ importance of factor i in point j , and
 d_{ij} = distance between points i and j .

In short, the amount of interaction is directly proportional to the attraction of a certain point measured e.g. in terms of the decision maker's perception of that point and inversely proportional to distance measure. The proposed correlation is consistent with the general model expressed by Sen and Smith (1995) as a compilation of many researchers' work; they claim that an extended, general class gravity model is $T_{ij} = A(i) B(j) F(d_{ij})$, where $A(i)$ and $B(j)$ are unspecified origin *weight functions* and $F(d_{ij})$ is an unspecified *deterrence function*.

4.3.2. Dimensions of Distance

Distance as a Conceptualisation

With respect to the basic concept in geography and space, the *distance* is measured as a geographical length of the entire chain. A supply chain consists basically of *one leading organisation* gradually establishing a co-operative network with many other organisations; the extended chain is a system of many linked, interrelating and partly overlapping chains with links between the nodes.

Distance has two contents: in *infrastructural networks* the term refers to the *physical distance*, whereas in *interorganisational networks* it refers to *organisational proximity*. In general the distance is impedance *between two points*, the actors. The distance as a hinder is specially an important attribute in the so called co-existence phase of network formation. This stage is one of the stages leading to deeper co-operation among actors in the net (Easton and Araujo 1992, 71-81). Distance can be defined as *friction* - impedance indicating spatial separation or segregation - between two points. This friction is an obstacle or hinder for interaction in space, thus reducing the amount and frequency of interaction. It is possible to describe the correlation between distance and interaction graphically by using a distance-decay curve. The graphical presentation is a downward loping curve expressing a simple trade-off: spatial interaction tends to diminish with distance.

Distance is typically measured with concrete distance (close to Euclidean distance), which means a straight connecting line between two points or a physical distance between two points. In addition, concepts like *time distance* and *cost distance* can be relevant. Economic distance is the sum of the total costs during the transportation; the time distance denotes to the total travelling time between two points. Regarding the time distance, there are some attempts in the logistical chain to reduce the transportation time by eliminating the non-value added time (NVAT). According to some estimations the NVAT is roughly 95 % of the total time (as interpreted by Burgess 1998, 18).

Spatiality in the Network View

In contrast to geographical distance locating facilities and assessing the amount of interaction, *cognitive distance* can be classified as *subjective distance*. In this sense Piaget's developmental theory (Piaget's fundamentals: perception and conception of single items (like space, or physical causality among individuals) is integrated to the spatial context. Every individual goes through different stages in his/her life - from infancy to adulthood - creating mental or cognitive maps from the surrounding reality. Information is filtered and it is a subjective perception of reality and real-life circumstances. Thus, an individual continuously assesses the alternatives, and with the help of cumulating knowledge, re-locates points in his/her mind, and consequently evaluates the distance e.g. with the help of mental maps (e.g. Novak 2002, 58-63 discusses the basic elements of Piaget's theory). In the constructive paradigm of behavioural sciences each individual creates new solutions and knowledge to a solid basis, which is constructed over time. The cognitive distance is a result of personal experiences with attitudes, values, norms, preferences as critical forces and drivers. In the spatial theory of interaction the distance hypothesis is common: the location of more attractive centres tends to be underestimated in terms of distance. Individuals may have

adopted new models when visiting this relatively more attractive place or they have gathered more information of the place through media or personal contacts.

In the network approach with sets of relationships four types of distance variables are listed in general: besides geographical and time distance, social and technological distances are considered (Ford 1997, 44). The geographical distance has undeniably a powerful cultural connotation. Describing the dimensions of the determinants the following features can be posed (compiled from presentations by Turnbull and Topcu 1994, 20, Ford 1997, Castells 1996, Ford *et al.* 1998):

Table 4.2 Variations of Distance Measure in Interorganisational Studies

<i>Dimension</i>	<i>Criteria for Measuring the Attribute</i>
<ul style="list-style-type: none"> • social distance 	level of friendship extent of exchange of special information frequency of contacts level of knowledge about each other
<ul style="list-style-type: none"> • cultural distance 	cultural differences with a non-local partner
<ul style="list-style-type: none"> • geographical distance 	location of point of interest
<ul style="list-style-type: none"> • technological distance 	differences in technologies differences in production technologies and features number/event of technical adaptation required
<ul style="list-style-type: none"> • time distance 	lead time (between acts, or actions, or episodes)

Interorganisational distance varies between zero (high intense interaction, no preventing factors, high frequency) and infinite (no connections, no transactions, no interaction; Castells 1996). In the network studies, it can be hypothesised that *objective* distance might be a poor predictor of interorganisational performance, since the social nets compress the distance by shrinking the space. In all, effective communication does not necessarily require geographical proximity, because the use of communication applications enables close contacts also in distant locations. Consequently, distance as a concept can be interpreted as *accessibility* or *interorganisational location*, thus having tangents with the position concept.

In general, the adoption of new behavioural features seems to have an impact on the perception of distances. Adoption is a process among individuals, having aspects like full-uncertainty and no knowledge before deeper awareness and even action regarding many options. This means that individuals' preferences go through effects on cognitive, affective, and conative (behavioural, experimental) levels (CAC-expression; see e.g. Novak 2002).

Considering the intermodal choice, the CAC- expression is quite valuable in evaluating the perception of distance. If a decision-maker (e.g. shipper or more general an actor in

a net) is at a cognitive stage, he or she has the basic information regarding the route. The knowledge is neutral and still quite a long distance is assessed in terms of cognitive distance. The affective level means more positive attitudes and preferences against a specific route or a counterpart. The conative stage refers to testing and experiencing the service promise provided by the operator. In addition, the successful co-operative activities as results of practical issues drive the individual's attitudes towards the conative level. The cognitive distance can be decreased by practical testing and gradual adjustments. In general, adoption as a process is more linked to situations in which an actor more unconditionally accepts the external pressures and their impact on his/her own activities. Consequently, *cognitive distance can be utilised to measure and evaluate the sum of factors hampering the interaction between the actors involved*. Moreover, the position as a conceptualisation includes, that each actor subconsciously examines his/her own mental space, which means that there is both a constellation of locations for the actors and bundle of dimensions impeding the interaction between the actors in their positions. Distance in general is one of the attributes of position as conceptualisation (see chapter 3.5. for further discussion). Furthermore, the physical processes of IM transportation ('real' ones) influence the interorganisational processes and perceived problem areas as well (see figure 1.2); for this reason the operational inhibitors are more closely discussed in subchapter 7.9.

Distance Expressing Interorganisational Friction

If the factors totally prevent interaction, the perceived distance between the partners is infinite. Furthermore, the distance analysis includes several aspects for the practical working procedure. It is essential to *analyse the possible pitfalls and obstacles for deepening the collaborative actions* among all the actors in a network. The perceptions are undoubtedly affected by non-subjective, concrete distance measures evident in the infrastructural network. With the help of appropriate methodology cognitive distance measure can be applied in those situations where the main target is to assess the *organisational proximity* between the partners. The distance measure is significant for the roles, as well. The roles are often *reinforced by closeness*, because of the diverse bonds between the actors. It can be hypothesised that the more bonds there exist between the actors, the less there is perceived remoteness, and the stronger are the identifiable roles. Regarding the position, it can be claimed that it is not possible to locate a single actor without considering the organisational distance; the location is indefinitely defined as relation to others. This is especially true when nets are considered; the social distance either enables being a catalyst or hampers collaborative interaction.

Concluding Remarks for Spatiality

When summing up the theoretical discussion of spatiality, it can be assumed that the frequency of interaction between two points (e.g. actors/nodes/hubs) is an attraction measure divided by some distance measure, as presumed in location theories. The attraction is a perception reflecting many determinants, forces and features and respective variables and can be linked with bonding as well (see e.g. Halinen 1994). The distance is cognitive in nature, as explained by some network scholars (e.g. Ford 1997, Ford *et al.* 1998, Turnbull and Topcu 1994) and has many variations, like social, technical/technological, and transaction based time distance; occasionally the term psychic distance is parallel to cognitive distance in IMP wording. In addition, e.g. the

adaptation process is crucial for reducing the technological distance between actors. Furthermore, the technological distance measure is essential for assessing the degree of structural bonding. It is hypothesised that stronger, reciprocal or multilateral adaptation with EDI systems significantly reduces this distance measure. In addition, it has an impact on personal, interfirm relationships as well. In brief, in this study distance measure captures *not only* the physical proximity, but more the *organisational proximity based on actors' perceptions of the obstacles and friction*. The spatio-temporal dimensions, in general, are fundamentals in the common interaction theory, though it has to be admitted that they are not fully explained especially in the field of logistics.

Finally, and considering the basic analytical unit of this study – the focal firm and the focal net – it is obvious that by defining a common space with short organisational proximity, the actors define the smallest network entity, the focal net. A longer distance demonstrates a network with which the focal firm does not have frequent but rather casual interaction (e.g. shippers, receivers, foreign operators).

4.4. Limitations of SCM-based Thinking in Explaining the Conformities of IFT

Although supply chain management and its managerial nature are an essential part of modern logistics thinking some critical notes have to be added. New and Payne (1995) associate SCM with *unhelpful research practices*, because it has some weaknesses: enough empirical evidence may not be found and the basis might not be a relevant one to support the basic ideas. As a result, a widely-accepted discipline can be harmful as it can be a *'wisdom'*; the theory stipulates the norms for analysis defining what is a valid approach and what is not. According to New and Payne, the domain is too broad and wide, and thus it reduces the scholars' ability to find out the real points: *'it becomes less clear what differentiates the subject as a distinctive field, and what constitutes valid research questions and investigative strategies'* (New and Payne 1995, 69). Moreover, the use of SCM has an impact on the research strategies as well; *the use of deductive reasoning has guided the scholars in logistics, and the use of inductive theories have not been in focus*. In addition, supply chain ideology is mainly applicable for conditions in which a *traditional manufacturing industry is performed*, and it is not so well suitable for explaining the regularities *in service industry*. Furthermore, the value creation logic in supply chain theory is problematic: value is created through sequential activities, with interlinked, partly overlapping or extended value chains. More evident is that the relationships *per se* have value and the processes are more non-linear, parallel and matrixed in nature.

In networks it is not often a question of how the firms operate, but rather how the actors in a broad scope are involved in the network/net. This means also that much of the interorganisational behaviour is as much interpersonal as based on formal, and rational decision-making across firm boundaries. Accordingly, the question of a real win-win situation is problematic, as every network hides the conflicts of interest and deleterious effects; the actors want to be involved in the network despite of these constraints. In SCM the non-positive features of the relationships are – if not totally ignored – discussed in minor details. In general, the relevance of SCM is poor in explaining the various elements of the ties (such like actor bonds) between the network members.

SCM depicts a reality where one firm (actor) dominates over others in terms of technological excellence, capabilities, power or size. This is not adequate in IM networks, though e.g. integrators have been rather active in creating new business. The network members are not obliged to adopt e.g. new practices or norms since there cannot be a ruler, but they rather adapt their own behaviour and processes depending on their role in the network. The role, and more accurately, the position is dependent on the interorganisational proximity between the actors; the conventional distance measures, as presumed under managerial view, are not appropriate in every detail.

As noted, SC is a *rough* simplification of the reality. It has been typical within SCM-based analysis that the multiphase, sequential processes are simplified by means of concrete conceptualisation. Often the major objective for the research is to find out the *causes and consequences* in the facility network. However, the role of single actions or events is not fully understood in SCM especially if these events are triggers of change but the effects cannot be explained fully. For this reason e.g. Wilding (1998, 46) states that the chaos theory can explain some of the odd points in chain systems; namely the inevitable facts that *'a small change to an individual unit (like a firm's single activity) within a system (like a supply chain) may result in dramatic effects of the global system'*. As regards the chaos theory, it can be claimed that though the supply chain looks deterministic in practice, the reality is different. The question of the causality stems from the fact that SCM scientists accept implicitly the use of the SR-scheme and its mechanistic worldview in contrast to the network view, which depicts the reality in a more organic way. Also, in IFT it is not a question how the system creates intermodalism but rather how the network is created through the engagement with the help of stable or dynamical roles the actors might have; moreover, the actors are embedded in the network, which consists e.g. of social structures. The SCM theory is poorly equipped to explain the true nature of these social elements.

Theoretically, chaos can generate patterns as well; the pattern is just more or less stochastic by nature. More accurately, the network approach considers multiple events when the regularities are explained by *addressing the non-linear pattern of processes*. The outcome is thus *less deterministic, implying an impressionistic interpretation of the reality*. Among SCM practitioners there tends to be an illusion of totally managing the chains/systems.

With respect to scientific analysis, in SCM they often address the higher managerial levels emphasising their decision-making. An network is a constellation of nets, processes, and structural elements on multiple managerial levels. Hence, influential decision-making in IFT often takes place on tactical, not on executive level (compare to figure 3.2).

Particularly in intermodal transportation the use of SR-scheme, addressing the functions that the firms perform instead of roles/positions can be an obstacle for understanding the real character of IFT. Interorganisational co-operation is influenced as much by the behavioural aspects as by the physical processes between the modes. Some other differences are discussed in a more detailed form in table 5.1. Nevertheless, it can be claimed that these views are complementary rather than excluding.

5. Theoretical Conclusions

Next a synthesis of the theoretical discussion will be made by presenting *nine* different implications, added by a comparison of the major verified differences between the two views – the network and managerial ones (table 5.1). Besides, a tentative model with processes, outcome and commitment domain guides the empirical analysis (figure 5.3) The role/position dualism is also anchored to the theoretical framework.

5.1. Managerial and Theoretical Implications

It can be claimed that basically a network analysis based on the interaction approach is descriptive but not explanatory: e.g. Tikkanen (1997, 76,77) states that the approach really lacks '*explanatory power needed to develop more concrete managerial implications*'. Easton and Araujo (1992) have compiled suggestions from several sources and they claim that the network view is both descriptive and *explanatory* but *not* so much *prescriptive* - at least when having a managerial focus. This implication can be a positive feature rather than negative, although it reduces significantly the utilisation of the acquired information. Easton and Araujo (1992) also claim that the theory does not have any disciplinary home.

The network approach seems to give valuable information on the relationships and activities' as well as the dynamics of the network. Nevertheless, the theory does not explain exhaustively why these things happen. What are the major variables and antecedents behind the phenomena and how have the network activities been influenced by the motives? Among IMP scholars some attempts have been made to describe the determinants and attributes for network activities but it seems that the depth of analysis has not been the same as in the partnership studies in which analysis has been one of the mainstreams in the research agenda. These facts - the descriptive, but not deductive perspective, the constructive, and even subjective nature – can be a slight obstacle for utilising the theory in strategic decision making. The subjective nature of the network approach has been an impediment for scholars to accept it as a representative of real science in which more rational explanations are traced for; some researchers even claim that it is as an example of postmodern non-science. Undoubtedly, to analyse causalities - the causes and their consequences - is more difficult under an interaction-oriented approach. In strategic and managerial partnering studies the utilisation of the acquired results is higher.

The impact of social network analysis in pure IMP-based examination can be a disadvantage in using the network analysis - as Easton and Araujo (1992, 74) point out, the utilisation of the social network approach might lead to an *oversocialised* view of behaviour. This problem is no doubt similar in every approach which attempting to explain the social structures and their impact on the behaviour in general and decision-making in particular. Besides, one of the problems in the network analysis is the fact that though primarily the examination should underline the activities and interdependencies in the *network context*, these studies have *de facto* a dyadic interaction setting (see e.g. Halinen 1994). It has been difficult to describe and comprehensively analyse the simplest form of net, a triad (again, the partnering studies

with strong operational and managerial roots seems to be more powerful at least under some circumstances, when e.g. discussing the integration of TPLs on dyadic matters).

Though the network perspective is generated through interaction models, the revealed problem is evident. Because most of the cases and working processes are based on the dyadic perspective it seems that the *network theory has failed to capture the diversity of network phenomena* at least when the dimensions and analysing tools are considered. This means that a real take-off from the conventional seller-buyer relationship- based analysis (dyadic level) has been more a less unsuccessful for the scholars. In the network tenet a broader perspective should be utilised instead of limiting the scope of interest to two partners and to the exchange processes they might have. Certainly, a lot of studies concentrate on analysing how matters outside the dyad affect the partners, but that should not be the main point in deep network analysis.

Moreover, in network studies a simple ARA- model is widely used, although it is quite conceptual by nature. A modification by Håkanson and Snehota (1997) is an attempt to find more explanatory ingredients at least when having a managerial focus (see e.g. Tikkanen 1997 on utilising the modified model). However, Hedaa and Törnroos (1998) dislike the extended for various reasons: in their view the proposal by Håkanson and Snehota limits the network perspective and reduces the theoretical base of a simple ARA- model. In this study a hybrid of these two ideas will be utilised; the basic architecture and dimensions of the ARA- model will be coupled with on AAE- model (actors, activities, events) in which the context, space-time attributes and even organisational learning are emphasised. However, the spatio-temporal dimension is implicitly embedded in the analysis through the setting it represents.

Furthermore, the Coase-Williamson theory depicting exchange as a transaction contributes to the analysis by giving additional scientific focus and different rationales for the discussion. The network researchers have utilised the TCA theory in its basic form: describing the governance structures and determining the best type of the relationship; it should be admitted that networks can be even defined as governance structures as well as pointed out by Axelsson (1992, 239). It can be stated that network analysis added with the perspectives of some other sciences that analyse close relationships, can be a valuable tool for further analysis.

Despite of some difficulties in implementing the findings of the pure theoretical network approach on situations in real-life business, some *managerial implications* and *benefits* compared to other forms of analysis can be exposed. In this thesis the following *nine* implications have been derived.

Implication 1: a network is a constellation of actors and relationships as it is an entity of operators in an infrastructural network. This assumption requires an examination of the network logic as well as including its ideas of openness. Moreover, though the importance of core competence as a basis for improving performance is widely accepted as a prerequisite, transparent processes within the relationships are required.

According to the network tenet, relationships are resources and they have value. With the help of customer *relationship management* a firm can analyse, plan, utilise, and control these critical assets; the relationship *per se* is a multidimensional determinant in which the economic value or aspect is one of them. The interplay between two

disciplines - RM and network approach - seems to be fruitful, giving new insights for analysing complex and obscure situations like the ones prevailing in the logistical context (compare to figure 2.4; also Appendix 1). In a broader context, the key question is not to investigate the customer relationships alone, but all the net(work) relationships. It can be noted that a firm has actually a *portfolio of relevant relationships* which it can affect. In the IM network an infinite number of relationships exists.

Furthermore, the main interest is not with relationships *per se*, but the dimensions, bonding mechanisms, diverse structures, perceptions, and outcomes of the more intensive behaviour. A single firm with a myriad of relationships can not interpret promptly the value of every relationship. Pragmatically, to test and analyse the impact of the variables of the relationships in a comprehensive way is difficult because of the complexity. Nevertheless, with the help of intensive analysis a firm can have basic knowledge of this valuable asset, and with the help of the findings tested under practical circumstances it can have a supplementary tool for creating strategic outlines. Basically the relationships are even more valuable assets than tangible or intangible resources. Though relationships are not explicitly embedded in the strategical outlines of firms, regarding the range of dimensions in relationships and emphasising the *strategical* one, a managerial implication can be found. Hence, the core competencies, if defined accurately, are important from the strategic point of view. Undeniably, the commitment for gradually deepening the relationship within a dyad or a triad carries some *burdens and threats* e.g. loss of control (unruliness), resource commitment, undetermindness, (misdirected actions), exclusiveness and stickiness (firm becomes connected with a whole network of other firms through a particular relationship; Holmlund 1997, 135, Håkanson and Snehota 1997, 17-22).

Commitment without investments or without reciprocal transparency regarding the disclosure of strategic information and unwillingness to accept the future difficulties can dissolve or damage the on-going relationship. This implication is crucial for intermodalism, since transportation industry is quite traditional in its conventions.

Implication 2: *In intermodal research more attention should be paid to the interaction between the actors in general.* The conventional strategical description with actors and reactors alone is not valid when the phenomena are explained more comprehensively. This requires the analysis of behavioural responses as well. Hence, it is necessary to grasp the *behavioural aspects of the co-operation* and its *social and structural elements* instead of focusing only on how a *single firm performs well* (as presumed in SCM).

In many of the studies in which the relationships are connected with partnering, alliances or some other form of mutual co-operation, numerous benefits and advantages are listed. Explicitly, in supply chain analysis co-operation is even an obligation for the parties involved. Therefore it is essential for the executive to understand the basic nature of this phenomenon; the evolution, dynamics, and forms of co-operation as examples. It is challenging for the researcher to investigate the dynamics in quite a closed network with a settled division of tasks and high barriers to external penetration. Besides partnering, the *network approach can give an alternative way to depict and elaborate the reality* especially if the reality is complex. Indeed, Tikkanen (1997, 205) has found out that business processes are not fixed, linear, and sequential; under these circumstances the network view can contribute to the discussion. The network view practically means the adoption of the iterative approach with a rich dialogue between

the theory and the practice (see e.g. figures 1.3 and 1.4). This is an obligation as the actors are not acting on deterministic, stimulus-response base. It is important to understand *the process and structure of interaction, not the one of action and reaction*.

Implication 3: In further studies *all the actors that have an impact on intermodal business should be associated with analysis*. Furthermore, *a detailed description of the inherent roles and positions is needed*, when analysing IM networks rather than addressing the functions of the operators. Besides, these concepts of change and stability require *understanding of the history* of the relationships as well.

In network view, *all the actors should be involved* in the analysis regardless they role in the business network. It has been noted (e.g. Freeman and Liedtka 1997) that it can be difficult, but not impossible to merger the different concepts and entities - the value chains and the stakeholders' view. With the help of the network approach a firm can identify the impact and role of stakeholders in its primary and core business in a more convenient way - the world outside is not faceless (Axelsson 1992). A firm is obliged to modify its strategy considering the reality outside (this is evident though there has been a debate on whom the strategies should be constructed, for shareholders only or for the stakeholderas well?). The network analysis passes these problems by in a sophisticated way because it is easily adjusted to a diversity of situations - e.g. Axelsson (1992, 195) concludes that the network is '*not a fixed constellation*' and therefore '*actors do not have common goals*' referring to actions which are not planned.

Presumably, the *outcomes are rather generated without common conscious actions than based on a commonly defined strive*. Briefly, a firm has two dominant 'needs': first, they have to *utilise* their resources and second, they have to *adapt* their activities and resources to their counterparts - the competitors, the co-operators, the members of numerous interest groups for instance. In addition, the key concepts for the analysis are simple: interaction, relationships, and network. All the functions and processes can be classified and analysed according to these basic elements. In intermodal research the facilitators (e.g. carriers, forwarders, and TPLs/logistics integrators) have traditionally been under consideration.

The concept of time directly implies the dynamic aspects of behaviour. Håkanson and Johanson (1992) state that the *history* of the evolutionary process of the network is a *key element* in understanding the constructs of network design; in general, a network is a '*product of its history in terms of all memories, investments, knowledge, routines*' (op.cit, 33, 34). Moreover, the changes have to be accepted by the majority of the network actors. However, and as an implication, the changes will be typically *marginal*, often hardly identifiable due to internal, often dormant resistance and deep stability inside the network.

Implication 4: For intermodal research *the role and impact of all the nets (e.g. personal, social, technological) should be embedded in the evaluation if interorganisational behaviour in general is under consideration*.

When considering and addressing the *social structures and embeddedness of the firm in the network*, including the social relationships, new mindsets have been created both for practitioners and scholars to understand the diversity of relationships and their impact on business activities. In firms the decision making is never independent, but rather

interdependent or dependent on other actors' choices and the position of an actor in the web of actors. Besides, the personal and human side of interfirm activities is more highlighted than in more typical managerial approaches. The network approach gives more information of the social factors that remain beyond the complex relationships. In many studies the impact of human behaviour is implicitly understood, but in the network tenet these essential features are better analysed and explained. Certainly, the theory is not so deterministic as SCM, and for the scholars as well as for the practitioners the subjective nature can be an obstacle to accept the theory, the inherent methods and the applications.

Implication 5: In contemporary analysis *more attention should be paid to the bonding mechanism, considering its scope and depth.* In intermodal research these features have been *implicitly embedded in the surveying but not exhaustively understood or analysed* (compare to Woxenius 1998). Arguably, this notation affects the strategical decision-making as well.

In recent literature regarding the *construction and development of strategy*, the role of *activities* has been highlighted. When framing the success factors for sustainable competitive position (SCP), Porter (1998) suggests that it requires an adequate position - and though not explicitly expressed - within a network. In his view competitive advantage arises from a fit across activities. In network ideology the activities and their interdependencies across firms' boundaries are analysed. Activities and resources are assets when a firm establishes a long term strategy. Besides these essential components also the *development of strategy* is one of the themes contributed by network ideology. The conventional - or rationalistic view as Ford *et al.* (1998) claim - view for strategy development is a series of sequential, hierarchically organised activities including the core processes: analysis \Rightarrow planning \Rightarrow decision-making \Rightarrow implementation \Rightarrow control (the APDIC- model).

The *organic view* as presented by Ford *et al.* (1998) emphasises the interactive nature a strategy development encompasses. This means that there is interplay between some identifiable, interwoven core elements in this process (Fig. 5.1).

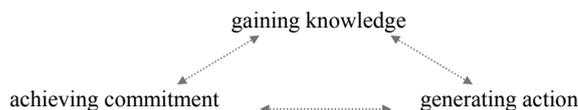


Figure 5.1 Ingredients of Organic Decision Making

Knowledge is generated through interorganisational learning with the adaptation process as one of the fundamentals. The commitment as a construct in a long-lasting relationship is a consequence of bonding: structural, social, or technological. In this sense the fundamentals illustrated above give a solid basis for understanding the non-sequential nature of more organic strategic planning. Considering the practical issues within firms, the organic view clearly complements the traditional APDIC- scheme. The strategical issues are moreover based on *position*, which is a base for strategic actions;

the position is influenced by the roles, identity, power and strength of mutual relationships among the actors.

Implication 6: It can be suggested *that in intermodal research, adoption is widely recognised as a process but less interest has been shown in adaptation or even assimilation, or other types of responses, which are fundamental when interorganisational behaviour is explained.*

The adaptation process is the cornerstone when changes in the network and the dynamics are considered. This finding can contribute the strategical understanding: it can be noted that many of the processes within a firm are actually adaptative responses. Implicitly the nature of adaptation processes comprises several reactions based upon initial actions in other organisations and the role of *initiators* in a network. Generally speaking, the adaptation process requires relational intimacy and congeniality as prerequisites to ensure the expected rewards.

Implication 7: Actions and reactions as behavioural responses – both from theoretical point of view and considering the pragmatics – *can give insights for analysing the roles of the actors.*

In IM analysis, the discussion is strongly based on technical-based investigation. Besides, the studies are often based on the idea of a combined transportation system, in which the railcarrier has been found to be important, but their role has not been widely analysed. This means that there is a need to evaluate the *roles and positions of a railway company also from an academic point of view.* The roles are based on the relationships created, and to the bonds as links. It is thus challenging to analyse further *the indicators of the roles* as well as the tasks, activities, and expectations performed by a railcarrier in IM networks.

Implication 8: The role of *space* and spatiality is vital in network studies. Instead of considering the concrete location of firms or operators (e.g. hubs, nodes, or facilities) as presumed in SCM-based thinking, how a single firm is embedded in its surroundings should be embraced including also the analysis of the *aspect of spatial embeddedness*. Actors - whether alone or collegially - perceive and *interpret the common space in a different manner based on their own mental maps*. Perceived distance – as presumed in the network view – can be an expression of interorganisational friction.

Implication 9: *The strong resource interdependency or dependency – not full independency – is a solid basis when the conformities of the intermodal network are studied further.*

In the network theory the *interdependencies between activities and resources are recognised*; when new strategies are implemented, transcendence of traditional firms' boundaries is a necessity. This kind of policy requires an application of the open books-principle. This principle implies that all the strategic information within a dyad, triad, or similar should be exposed to the use of other actors as well. Accordingly, the open books-principle requires more transparent activities among actors when synergistic performance is requested. Undeniably, the implementation of this kind of policy is extremely difficult because mainly all the actors involved are responsible for their own performance and profits in the first place. The traditions in interorganisational behaviour might hamper the actors to fully rely on their counterpart if strategical information and knowledge is shared, at least when the disclosure of meaningful information - calculations for internal use for instance - is considered. This kind of policy can be one of the major prerequisites for interfirm cohesion in the convergence process.

Table 5.1 explains some of the *differences* (terms, processes, features) between two distinctive perspectives in modern logistics and especially in IFT: the managerial view represented by the SCM thinking and the network view are under consideration. *Much of the theoretical discussion is also summarised in the dualistic comparison.*

Table 5.1 Differences between Managerial and Network Views

<i>Issue</i>	<i>Managerial View</i>	<i>Network View</i>
Main Objective in Network Presence	to manage	to develop
Strategic Decision Making Procedure	Rational	Organic
Levels on Focus in Analysis	Executive	Multiple managerial levels
Assets	Tangible and Intangible Resources	Relationships
Boundaries of the Firms	Clearly defined - independency	Dissolved / borderless - interdependency - dependency
Dominance	One or two for a chain / system	Any actor in a net / network
Major Theoretical Problem Setting	Markets or networks	Markets as networks / between markets and hierarchies
Processes	Sequential, linear in ⇒ chains/ channels ⇒ extensions required	Non-linear, parallel, matrixed in ⇒ networks and nets
Typical Behavioural Responses	to react / to proact / to adopt	to adjust / to adapt
Strategical Decisions	Due to rivalry	For network change, dynamics, and stability
IO Knowledge	Organisational teaching	Mutual learning, open dissemination
Intraorganisational Decision Making	Hierarchical: top – down Renewed hierarchical: bottom – up	Horisontal, cross-functional exposed to info sharing in nets
Theoretical Approach for Structures	Simplification: systems - subsystems	Complexification: dyadic - networks
Theoretical Explanation Constrained by	<i>Ceteris Paribus</i> - assumptions	Context-bound- considerations
Researchers Role	Interpretative, analytical	Reflective, committed
Epochal Period	Industrial / Modern	Postindustrial / Postmodern
Analytical Scope	From α to Ω / Controllable	Impressionistic / Chaotic
Driver for Better Performance	Strategical thinking	Strategizing actions
Theoretical Applicability	Mainly reductionist view: more universal	Reductionist and holistic: more particular
Environment	Faceless representing external forces	Rather context, identified actors representing DMs

Inevitably, table 5.1 absorbs out all the *weaknesses of tight dualistic classification* and hence it can not be appropriate in every detail. Consequently, these two distinctive views approach each other as figure 5.2 shows.

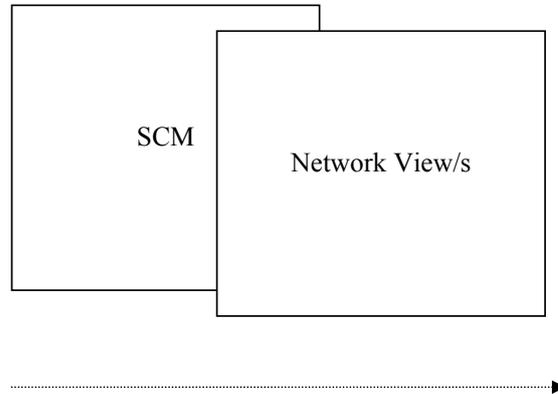
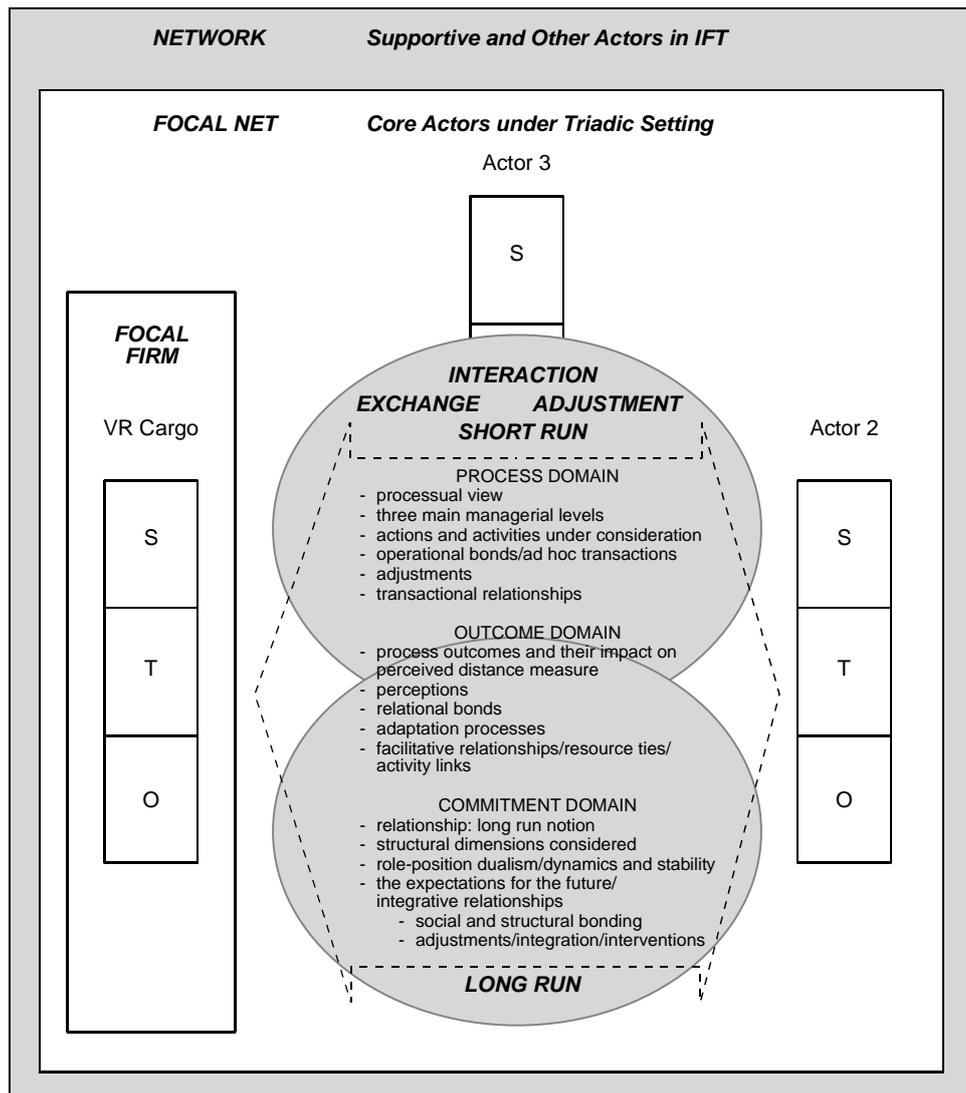


Figure 5.2 Convergence of the Network Views in Logistics

In the illustration the horizontal axis presents how the degree of abstraction increases. It seems that in near future future there will be a convergence between these two different views, which means that partnership studies are approaching network view/s in some details.

Finally, when summarising the theoretical discussion added with some preliminary findings from *empiria*, a frame is created for the empirical investigation when a focal firm and focal net are under consideration. Because of the fact that interactive, not reactive or proactive phenomena are under investigation, no clear and tight causal links are exposed. In general manner, however, some explanatory, probable directions and attributes affecting other determinants are posed. The four levels proposed in the early stages of the investigation - operational, tactical, and strategic as well as the technology level - are illustrated as in figure 5.3.



Key: The levels proposed are: S=strategical, T=tactical and O=operational level

Figure 5.3 A Tentative Model for Actor Behaviour

The *outcomes* are widely examined in the theoretical literature with different meanings and interpretations, to name (Hovi 1995, 25) outcomes as advantages or disadvantages, outcomes defined as performance or success of the co-operative arrangement (e.g. Håkanson and Snehota 1998) and outcomes as a part of the process of co-operation. Of all these three distinctive interpretations the third way - *outcomes as a part of the*

process - is mostly utilised in the network science especially regarding the most commonly analysed setting – the buyer-seller relationship.

In this thesis the *outcome* has **two** aspects: **first** it is one *part of a process for a relationship* in a long run when mutual commitment of the actors is traced for. Outcomes are the reflections, results and consequences of a short term relationship, having variety of dimensions and processes of which the exchange and adjustment processes are the primary ones. **Second**, outcomes are *resulted in a short term interaction process* based mainly upon *ad hoc* transactions between the actors. In this sense, the outcome as a domain is a mediating or connecting stage between two distinct stages of collaboration: transactions and relationships. Furthermore, these suggestions allow the researcher to sketch the longitudinal evolution process in a stable IM network.

The *domain* in this specific context contains the managerial levels that should be viewed and that result in co-operation, expressing the actors' will for closer relationships. Indeed, managerial domains are actually '*interrelated clusters of managerial issues*' (Möller and Halinen 1999, 416); in other words, with the domains we capture the matters that influence the mutual relationship in a dyadic/triadic relationship. Moreover, the domain can even be '*an arena in the value creation process within the relationship*' (Holmlund 1997). According to Aastrup (2003, 136) the domains are important since '*they affect where organisations meet each other (...) and what they expect from each other*'. Besides, domains are important because they allow the organisations to define their mutual interests and the matters to be accomplished. With this specific concept, the main variations of the collaborative behaviour among actors under dyadic/triadic setting are captured. Furthermore, it allows the researcher to find the core categories and the concepts on different managerial levels. It is suggested that the value is created through relationships on three managerial levels in contrast to SCM, in which the analytical interest is on the upper strategical level. In addition, the outcomes strongly refer to experienced and perceived satisfaction between the parties involved. The *distance is a measurement tool for assessing the remoteness–closeness axle of the relationships* affected by the possible obstacles, and barriers for interaction. Besides, *proximity in general is also an important variable affecting the role expectations*, too. Moreover, an actor is obliged to encounter the spatial embeddedness as well.

The three distinctive domains - interaction processes, the outcomes, and commitment through deeper relationships - represent also the evolutionary process of the dyadic/triadic relationship including the temporal dimension. The interaction domain is mainly a reflection of daily, mainly operational activities tied with some operational, often formal bonds (e.g. legal or economic). The outcome is a result of the diverse processes the mutually tied partners might have. Besides being a result, the outcome reinforces the relations to be developed and strengthened. The expectations are shaped by the relational bonds. If adjustments have a short term notion, the adaptation process as a component process has a longer term notion. The outcomes are perceptions; it is hypothesised that perceived distance (the distance friction or impedance) will be significantly shorter in more co-operative actions. This means also that the degree of interdependence will be notably higher.

As noted above a relationship is a result of more interactive processes. The analysis of a relationship requires that the impact of several *structural dimensions* (position and

embeddedness) should be highlighted especially if *dynamics* and *changes* in this rather stable net are to be considered. The *bonding mechanism* is also *structural in nature*: social and structural bonding are a result of diverse determinants like technology, adaptations, satisfaction, experience and even trust. It should be noted that the model is a processual perspective indicating a deepening and strengthening relationship.¹

1) Besides the three domains presented in this study, also (Ford *et al.* 1998) have proposed three categories for defining the relationships: there are transactional, facilitative and integrative relationships. Of these three, transactional represents short-run exchange; whether business, information or social exchange. No integration occurs between the partners involved. With facilitative relationships the partners have willingness to invest in the relationship; e.g. in the resource ties, activity links and actor bonds that are required if cost-efficiency is targeted. The integrative relationships require mutual adaptations; interventions are typical and acceptable and they are applied in many of the long-run exchange occasions.

PART II: Empirical Study

6. Research Methodology

6.1. Scope in Practice

The aim of this subchapter is to present the participants of intermodal transportation industry with the help of dualistic channel structure (figure 6.1; see also appendix 7). The channel structure encompasses all the members of the chain that have operative activities in the intermodal business; thus *the real processes* of Intermodal Freight Transportation (IFT) are underlined (compare to figure 1.2).¹ Because of this, the supportive actors – such as stakeholders - are not included in the presentation. According to the explanation, two basic types of relationships exist - *commercial relationships and operational relationships*; the classification of the relationships in such a dualistic manner was also often expressed by the informants in the interviews. The actors have been defined on the basis of their practical tasks in the transportation chain.

The presentation is valuable, as it expresses the modular nature of intermodal (IM) transportation. The need for intermodal transportation service is *generated through the diverse commercial transactions between a seller and a buyer*, who can be shippers, receivers, or other companies (e.g. freight forwarders) representing the primary parties. The transportation service is a necessity, when *a shipper as a marketer wants to give value-added services for the customer*, which is often, but not always, a consignee. There is no need to procure intermodal freight transportation service without this primary commercial relationship between the parties. Hence, the ultimate customer as an end-user in IM business is either a seller – as in most cases – or the buyer, depending on the responsibilities as stipulated in the primary contract. However, in IM transportation the buyer can also be e.g. a port operator or stevedorer. Hence, the classical dyadic seller-buyer- setting with shippers and receivers does not always work as an explanation. From a practical point of view, the use of trade terms/terms of delivery is a necessity, setting the terms and conditions for the obligations between the seller/shipper and buyer/receiver, and thus for other major parties as well. Furthermore, the freight forwarder as the TPL carries out most of the activities that are needed to accomplish the obliged transportation service.

It is vital for the service provider to invent means for improved service, which is part of the total value-added offered by the network of operators. This requires synergetic efforts from all the parties. With this respect intermodalism is dissimilar to other transportation modes: value is generated through joint network efforts and capabilities in the value net, not through increased attempts by one single operator.

1) Nevertheless, and controversially to the generic nature of intermodalism as a term, two of the respondents in the preliminary interviews argued that multimodalism is an umbrella for the related terms, *not* intermodalism.

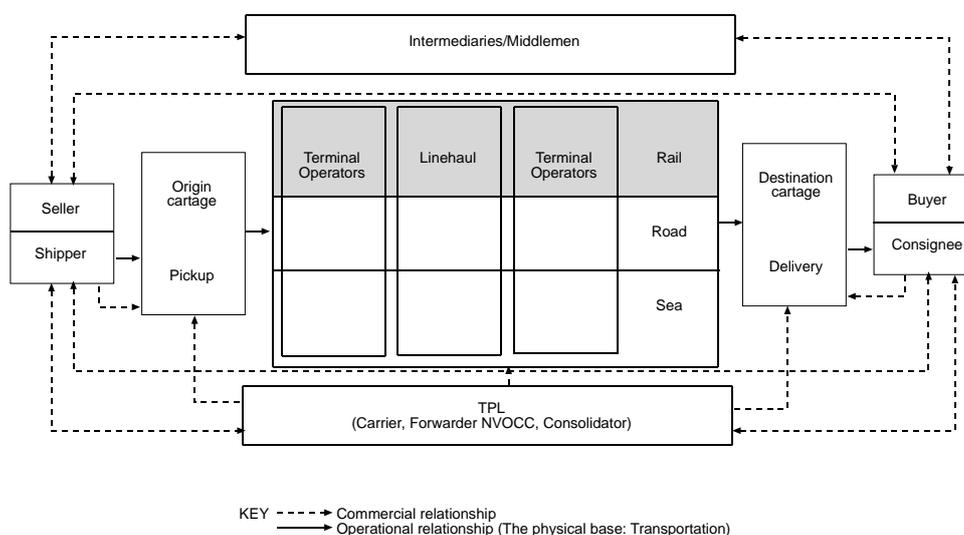


Figure 6.1 Major Functions of Intermodalism

In this study, *VR Cargo*, representing a railway company or railcarrier, is the *focal firm*. The *focal net* consists of the *other perceived members in the business network with whom the focal company has a direct relationship*. Hence, the definition is in accordance with the idea suggested by Salmi (1996), when she underlines the focal firm's partly subjective way to interpret the focal net. However, in this study the participants of this most adequate net are important in terms of revenue and volume for *VR Cargo*. Furthermore, the local net is a constellation of regional actors and these members have a direct or indirect relationship with the focal firm. With respect to relationships, there is a difference between full wagon load service and service for transporting ITUs. *VR Cargo* has often direct contacts with the customers (often key accounts) who actually acquire the service in full wagon load or block train operations. However, in IM business, the focal firm is responsible for providing haulage in the main carriage stage offering scheduled operations in some specified routes. This means that a road carrier, forwarder, or other operator has direct contacts with the end-user, not the railcarrier. Respectively, the relationships are different as well.

6.2. Empirical Working Process and Data Collection

In this subchapter some theoretical remarks on the research approach are presented, together with some features of the methodology. Furthermore, justification for the methods applied in the study is given.

During the last decade, two mainstreams for research have dominated the analysis in Finnish business studies: the *nomothetic* or positivistic (or as Easton 1998 defines it: the nomothetic/hypothetico deductive) approach and the *action-oriented /subjectivist approach* (Tikkanen 1997, 113). It seems that the qualitative methods generally associated with case studies have gained more success. It can even be claimed that qualitative methods and the use of case methodology - single or multiple - has become a ruling trend in recent analysis, though some criticism has been presented regarding the relevance of this method. In logistics, however, the modern positivist paradigm based upon testing the theoretical frameworks created *a priori*, seem to be more common (Garver and Mentzer 1999).¹ In general, the chosen methodological approach of the analysis is an answer to the basic questions of the objective (the relations and bonds within dyads, and nets) and the problem (how do the parties - the providers for logistical services - interact on multiple managerial levels and what are the consequences – the roles - in structurally bonded nets/network).

It seems that there is a need to enhance the traditional, more analytical, and technology-based analysis with more holistic and integrative, socially-oriented methods. The action-oriented approach as an option, though resembling the traditional case studies, differs slightly from them: more attention is paid to *real human action on different managerial levels with strong emphasis on every person's involvement and their interpretations of the reality*. It is essential to analyse the activities and even the single acts or events by splitting the phenomenon to its core issues. Furthermore, there is often no pre-defined theoretical framework including hypothetical suggestions. Some recognisable features include also *pragmatism, non-standard procedures, experience based data*, and even *intuition*, which all are highly addressed (Tikkanen 1997). Furthermore, the researcher is in continuous interaction, and even debate with the actors to be analysed. Besides, it is not possible to analyse *action and context* separately. However, it can be difficult to draw a line between ordinary case studies and the action-oriented approach.

1) There are some signs that the action-oriented approach (or action research, even action science; Gummesson 1991, 102) has been accepted more commonly for a scientific method in logistics as well; for Tikkanen (1996) the action oriented approach is a hybrid of two methodological views: the systems and actor approach. The actor approach is similar to the explanations given by Arbnor and Bjerke (1977) for business economics in general and Christiansen (1998) in logistics research.

Besides, the purpose of the methodological selection is to eliminate some problems related to the conventional analysis. The chosen methodology aims at avoiding the traps there have been in case-based studies in logistics. Lambert *et al.* (1999, 168) point out that in most partnership studies the examination relies too much on ‘*structured questionnaires, focus on one side of the partnership, and involve a single executive from each organisation*’. In this study, it is aimed to avoid these pitfalls; the use of semi-structured questions/themes is applied in every stage, both sides’ perceptions within a dyad will be scrutinised, and the respondents often represent non-executive actors in their organisations.¹

Though more integrative than holistic, it is of great importance for the researcher to *achieve a comprehensive understanding of both the network structures and the processes in their context* (Tikkanen 1997, 87) at least in the initial and preliminary stage of surveying. The focus on context has an implication: the knowledge that is gathered, analysed, and compiled is quite strongly both context- and situation-bound. Furthermore, it can be difficult to generalise the achieved results. This does not mean that the structural aspects could be similar in other contexts and situations. Some general dimensions and the abstractive conceptualisations can be linked with other types of settings, remembering, however, the criticism.

As indicated in chapter 1.3. there are several challenges for IM studies. From empirical point of view the major challenge is that in Finland *rail-based IM business is very operative by nature*, and it can be reasonably claimed that *all the responses are more or less reactive in nature* (compare e.g. to table 7.1). The major obligation for the focal firm has been to *ensure the traction performance in linehaul in some specified legs: from point of departure to the point of arrival using terminal-terminal- conditions*. Besides, the interest to increase the volumes has been modest, partly because of internal (freight rates, not appropriate schedules, lack of terminals) or external (the increased concentration of traffic flows to southern part of Finland) constraints. Regarding the implications for the scientific analysis, *many of the decisions are actually made on tactical level, or operational level*.

1) When looking for the metaheoretical and philosophical roots of the action-oriented approach Tikkanen (1997, 83, 84) argues that several views are similar or close to this subjectivist scientific methodology, e.g. constructivism, relativism, conventionalism or critical pluralism. When listing different orientations in social research-oriented industrial marketing, Easton (1998) discusses four epistemological orientations: realism, positivism, conventionalism, and constructivism. Constructivism adopts the idea that knowledge of the *world is constructed, usually socially* and there is no reality to be found. As Easton (1998) argues, the network view is non-normative in nature. When collecting data the researcher employs his/her own personal perceptions in order to gather, filter, assess and interpret the information. All these philosophical views can be classified under postmodernist thinking. Typical for the postmodern and postindustrial themes is that they are more or less descriptive, and associated with some specific context in time and space. In such a case, it is not of main interest in the research process to create, construct or test the applicability of stable, universe, and uniform models and frameworks presented a *priori*.

It is worth noticing here that in academic literature ‘lower‘ level influences have often been ignored in logistical research. One of the reasons is the *dominance of strategic partnership type of studies emphasising the executive level’s opinions and explanations*. However, in the network view some attempts have been made to enlarge the traditional perspective, though e.g. Håkanson and Snehota (1997, 408) claim that there is ‘*a general tendency to underestimate their (local and lower adaptations’) significance*’. For this reason, the three distinctive levels (operational, tactical, strategical) were chosen for the empirical analysis.

In general the study relies on the following *principles*. The method consists of a *qualitative case-based analytical approach* founded on *rich empirical data* having the following *six* features:

First, a strong interactive and iterative view is carried throughout the working process. Operationally, the theory generation and data collection were conducted simultaneously. The purpose was to maintain an on-going dialogue between theory and practice. This enabled the researcher to define and thus evaluate the role of some factors and the motives which lie behind the behaviour and are typically hidden and latent in nature.

Second, the tentative model aside, there was no strict frame presented *a priori* by means of processual flow-charts, conceptual frameworks or similar, expressing tight causal links because of interactive phenomena. In this sense, the research setting is different compared to nomothetic analysis, which is based on the idea of expressing a tight causality with SR- scheme as a prerequisite.

However, the lack of a tight conceptual model for explanations - constructed *a priori* and indicating causative factors for outcomes - is not an obstacle for a more interactive research procedure. On the contrary, Pettigrew (1998) even propose to use conceptual *vocabulary* when setting the boundaries for research instead of using a conceptual framework. On the other hand, the relevant issues expressed by means of appropriate vocabulary can give tools to accomplish the chosen course of action. In addition, the choice of themes with the help of adequate vocabulary can later lead to alternative conceptual frameworks. Generally speaking this setting - no conceptual or theoretical structure made *a priori* - means actually the use of more inductive logic. It is important that the researcher should have *ability and willingness to reflect the responses* expressed by the interviewees, and analyse and *interpret them correctly a posteriori*. Under the circumstances where no model expressing causalities exists, and hence the phenomena under consideration are context specified, the *generalisability is problematic, even impossible*; the separation between causes and effects in general is problematic under the actor-actor- scheme. However, though e.g. Glaser and Strauss (1967, 234) claim ‘*a single case can indicate a general conceptual category or property; a few more cases can confirm the indication*‘ the researcher should be quite cautious and careful when enlarging the findings and results proposed to other settings.

In general, the lack of simple causal explanations expressed by means of cause and effect- correlations is typical for interpretivism (Easton 1998). This approach is also based on other ideas, e.g.: human beings (like actors) construct multiple realities, the researcher and researched are mutually dependent, and the researcher is never value-free. In this thesis, the orientation is close to constructivism, with some

differences: in the pure constructivist analysis the use of the case method is often rejected and some other form of in-depth contextual method is preferred instead. In this study, the number of informants was fairly high, restricting the use of deep interviews. However, the question of *value free science* is problematic, as all researchers carry some pre-constructed attitudes, preferences and other personal attributes with them during the entire working process, especially when interpersonal issues are under consideration.

Moreover, as Lowendahl and Ravang (1998) postulate, under these circumstances it is not possible to explain *ex post* and predict *ex ante*, in contrast to the SR- worldview. In addition, the objective is *not* to *construct* first and then *test* a valid, formal, grand, or inflexible *general theory*, but to find the main points in the interactive processes the actors might have. Lowendahl and Ravang (1998, 765) describe these as '*insights that may give inspirations for the development of new local solutions*'. Thus, the *concepts and vocabulary have a vital role in analysis*. However, the scientific methods used in this study carry out the features of *verification*, *not* those of *versification*. Besides, the phenomena in general have temporal aspects and they are unique and non-sequential. The temporal dimension representing the evolution of the relationships is included in the analysis. Changes and dynamics are associated with analysis using the retrospective data and respondents' perceptions of the major events of the relationship.

Third, the aim was to avoid 'WUAWUG- syndrome'. The WUAWUG syndrome (What-you/U-ask-is-what-you/U-get) is one of the obstacles for the researcher to get in-depth knowledge regarding the interactive issues that are under consideration. A pre-defined theoretical framework might force the researcher to use the wording, concepts and expected causality of the pre-explained model, including the use of appropriate vocabulary. Undeniably, this significantly reduces the validity of the analysis. A rather similar idea is described by Gummesson (1991) when he discusses a *procrustean science* - an idea derived from ancient Greek mythology - which refers to misuses of theories and models for formulating the hypotheses to be tested. When such hypotheses are used as the point of departure in research '*they govern the way questions are asked and the way answers and other observations are interpreted*' (op.cit. 55).

Fourth, some preunderstanding of the phenomenon in general, and the causes and consequences regarding the bonding mechanism (the determinants and antecedents behind structural and social bonding, e.g. the question of adaptation of common technology as an attribute for structural bonding) is used. Indeed, one of the questions affecting the validity of the study is to assess the *degree of preunderstanding* and its impact on the analysis in its every stage; theoretically in a study founded on *empiria* there should be no restricting frameworks regarding the theme that is scrutinised. The pre-understanding might hamper the researcher to find the *latent or dormant features of the reality* beyond his/her own knowledge. The reality is assessed by means of cumulative knowledge, which is based upon personal experience; again in the research process the scope of interest and depth of analysis is limited by personal characteristics and present knowledge.

There are some risks associated with the preunderstanding; the researcher can accept information which confirms his/her own personal attitudes. Undeniably, the present writer's own experience as a marketer in VR Cargo during the last decade has influenced the study in some limited details. Hence, the researcher can not totally deny

the fact that there were some preliminary assumptions based on the literature, own observations, and working experience, which can have slightly affected the study. On the other hand, and considering the fact that there was an objective to enlarge the number of functional and managerial levels from the strategic one to other levels, presumably the *experience enabled the researcher to use sophisticated and sensitive methods especially in the interviews*: e.g. the use of semi-structured questionnaire requires knowledge about the reality on every managerial level.

Fifth, continuous refinement of the insights, adequate factors and concepts during the working process was aimed at. In all, during the research procedure emphasis was more on conceptualising than theoretising or modelling. This implies inductive reasoning, which requires the implementation of iterative procedure: the idea was to conduct data collection and interpretation simultaneously. This means a refinement of conceptual thoughts that have been created *ex ante* on the basis of pre-understanding (literature, personal experiences, preliminary interviews). Within more traditional qualitative analysis the data is collected first and commented and analysed later whereas the grounded form of analysis is more interactive, including a continuous iterative process while working.¹

In many studies both inductive and deductive reasoning logic has been used. Pettigrew (1998) even proposes that in practice a *hybrid* between these two could be reasonable: the research process could be cyclical, having both *deductive and inductive phases*; a parallel utilisation of the logic is also possible under some circumstances. According to Pettigrew (1998), essential *deductive drivers* are often needed to ensure the analysis of structural issues: the primary purpose, themes, and questions can form a deductive structuring. Regarding the structural bonding, e.g. the deductive method was utilised here, though predominantly the reasoning is inductive in nature, referring to an iterative and cyclical procedure. The use of these two different reasonings have enabled the researcher to identify patterns.

1) The reasoning in this dissertation is more *inductive* than *deductive*, due to the iterative nature the entire working process has; undeniably verification is needed in both of these forms (Glaser and Strauss 1967). Within *deductive logic* there should be *premises as prerequisites* in order to draw *conclusions*. It is essential to find the correlation in logical relation between the premises and the conclusion. The analysis implies the identification and explanation of causes and consequences - in order to demonstrate the *implication*. The deductive method is more hypotheses and theory *testing*, whereas the inductive method is more theory *generating*. Although in modern logistics the deductive reasoning has been major the scientific logic, recently the inductive orientation - together with more networking issues - has gained more popularity among researchers. For practical reasons, however, there is an emerging need to find the justifiable causal relationships of the phenomenon, because the practitioners demand managerial benefits.

In the first stages of the research process, there was a robust interplay between conceptualising, data collection and data analysis. However, the societal processes, which have a predominant role in the grounded theory, are not examined as much as in the common grounded theory. However, there is also a risk when social interaction is discussed. By overstressing the societal processes in interorganisational behaviour the more appropriate rationales may remain concealed. It should be underlined that the transportation industry is traditional in its conventions, in which rational decision-making is highly appreciated.

Sixth, the *operational issues on lower managerial levels* are highly emphasised; acts, actions, events and transactions generate the managerial outlines for the parties involved; on the other hand, a holistic view governs the surveying.

Regarding the pragmatics of the analysis, the *chronology of the research work – stage by stage* - as well as the main targets with every stage are described below (a graphical presentation is offered in figure 1.4):

Stage 1

Before intensive analysis, the researcher should be aware of the core questions of his/her study. In this thesis the procedure begun by contemplating on the *recent state of intermodal research* with special attention to the contribution of *academia*. Because of the fact that in all nets, synergetic performance is needed to ensure higher productivity, less costs, and improved value, the *question of collaboration* was strongly emphasised. Without more intensive and closer co-operation the operators will fail to achieve the objectives they have set. Whilst searching for coherence, the operators a lot of challenges and obligations. In this stage, the research mission was accomplished by an investigation of state-of-the art literature for partnering, having focus on managerial SCM philosophy and network theories, with special attention to IMP- based modelling. Furthermore, it was critical for the study to evaluate the *appropriate theoretical approaches for analysing the intermodalism*, and furthermore, the major theoretical differences between the contemporary logistical views. In this particular stage also the tasks, roles, and practices of the operators were strongly emphasised. This stage enabled the researcher to clarify the early pattern recognition.

In this stage, the objective was not just to screen the adequate theories or to sample the themes and to categorise them, but also to produce writing simultaneously. This kind of working procedure seems to be typical in modern logistics science (see e.g. Woxenius 1998) or as De Burca and McLoughlin (1998, 95) proclaim regarding the issues mentioned - writing, compiling and editing in a quite iterative way - typical is that *‘the investigator examines the data as they arrive and begins to code, categorise, conceptualise, and to write the first few thoughts concerning the research report almost from the beginning of the study’*. The described process is not just for the practical stages - when the interviews are conducted - and after the literature review, but during the entire working process *beginning from the first ideas, concepts and general themes*.

Stage 2

After an intense literature survey, testing of the relevance of the ideas generated through the theoretical endeavour was conducted. Practically this was carried out by having *discussions with the practitioners without any strict questionnaire*, strongly emphasising the local net members as informants. Besides, there was an urge to refine the theoretical proposals made by considering especially the partnering formation procedure in general, its dimensions, and problems of when an actor is collaborating with the counterpart. Besides, the tasks, expectations, and anticipated activities performed by a railway company were scrutinised. There were also some secondary sources in the analysis, although many of the informants refused to give any secret material for the researcher. Also further designing of the ideas posed by the informants was done by adjusting the proposals according to the observations from the reality; using the *ideas of grounded theory in a quite narrow manner specially when the gathered material was coded and interpreted* in order to get in-depth categories of the discussions; some of the results have been discussed elsewhere (Nikkanen and Lukka 1999 and Nikkanen 2000). Recently, the ideas of the general grounded theory have achieved more success among scholars for diverse reasons, though apparently *'there has been a very selective reading of the grounded theory'* (De Burca and McLoughlin 1998). Due to its primary nature the method has been mainly used in complex situations when absence of causative models created *ex ante* has been evident.

Stage 3

The major objective in this phase was to redefine the proposals made earlier. Besides, *pattern recognition* was of major importance, including the *critical comparison of theories*. Additionally, a further analysis of the narratives as well as interpretations were made. More specifically, also *disconfirmation, critical evaluation considering proposals in the distinctive theories, and verification were considered*. The researcher made a conclusion that the partnership studies representing the strategical view do not *describe the reality in the most comprehensive way, especially when intermodalism is analysed*. This is especially true with the roles, as the questions of interorganisational behaviour are not deeply analysed or understood in technically-oriented analysis.

Because of the great number of participants in the IM chain, a decision was made *to limit the extent of the analysis*. One firm, which was regarded as one of the most important players – a railcarrier – was chosen for more deep analysis, though it was in the spotlight already in the beginning of the research process. There exists a limited number of studies concentrating on the description of a railway company's activities and roles from interorganisational point of view. A lot of technically-oriented examinations addressing e.g. interoperability exist, however.

Stage 4

This stage consisted of further discussions with the members of the focal firm concerning the targets and refining the theoretical objectives of the study. This was accomplished by creating stronger linkages between the theory and the practice. *Choosing the focal net of operators for the study, together with the representatives of the focal firm was also conducted*. However, some of the respondents are chosen according to the researcher's own preliminary knowledge and contacts. The aim was

also to draft the role typology by exposing the major indicative behavioural dimensions for the core categories.

Stage 5

In stage five, second-round interviews with the practitioners were conducted (see appendix 4 for the chronological order; also appendix 7). The list of informants was created mainly in close co-operation with the members of the focal firm.

The number of informants in the two different interview sessions was 25, representing 15 different operators. The sample consisted of VR Cargo's *major partners in intermodal freight transportation*. Totally, the informants account for the major part of the total revenue of the focal firm in domestic IM business. Some of the informants *did not have any contractual bond with VR Cargo or any direct business relationship*, but as their decisions and perceptions are important in general, and because they indirectly influence the traffic, they were chosen for informants. In all, the actors involved represent very broadly the IM operators (see appendix 4 for more information regarding the informants).

Before asking to participate for an interview, a letter describing the major objectives of the study was sent to all the potential respondents (see appendix 3). After the informants received the letter, the researcher asked the actors to participate in the study by a telephone call. None of the potential informants refused to participate. With respect to their positions, the interviewees were mainly co-ordinators and liaison managers for the focal firm in their organisations. In most cases, there is just one person who is responsible of the contacts with VR Cargo; occasionally, however, two people were representing the company. Together the specialists involved in railbased business create *a loose net of actors tied up with a cognitive bond* and sharing same kinds of opinions and worldviews. They also know each very well. Besides, most of the persons have quite a long working experience in the field.

Before an agreed interview day, the questions attached with the list of bonds were sent to the respondents by email or by fax. This was done to ensure that the informants had a view of the themes to be discussed. Prior to every session, the researcher informed the respondent of the basic features of the process by describing the nature of the semi-structured analysis method and specifying the themes included. The researcher allowed the respondents to skip certain themes, if no adequate information was available or well-working practices evident; e.g. many of the operators did not have any development projects with the focal firm in IM business. The fact that the study was not funded by the focal firm was also strongly accentuated. This was partly to assure the informants of the neutrality of the research, specifically in this stage. Besides, the researcher allowed the informants to contribute to the session by exposing additional and complementary themes, if necessary.

Each interview session lasted approximately 2 hours. In the beginning, and before the themes were negotiated through, there was often some free discussion regarding intermodalism in general, or the performance of the focal firm more specifically. The themes in the semi-structured questionnaire were gone through, although the respondents were clearly informed that they were allowed to give some additional comments during the discussions. As mentioned, some themes were not included in the

sessions e.g. if there was no appropriate information or experience of the issues under consideration. The interviews were not recorded, as in the very beginning several informants told the researcher that they would not find recording acceptable. Instead, during the dialogue, researcher made *notes intensively*, and these notes were later *coded and interpreted*.

Regarding the classical asking-answering way of communication (which means the use of the actor-reactor- scheme in pragmatism), New and Payne (1995) are of the opinion that getting reliable data requires more than just simple asking. Besides, the most interesting questions are often the most difficult ones: the motives behind personal behaviour, e.g. on what basis the information is actually filtered, can be hidden and latent for the informants themselves. Therefore an intensive interviewing method requires a sensitive and interpretative way of communication to ensure the reliability of the research. This means that occasionally the researcher is obliged to do interpretations already when the interview is on-going. Besides, *the researcher should be capable for modifying the range of relevant, flexible, and situation-oriented questions in every phase of the process in order to ensure the validity of the investigation*. This is an imperative, e.g. if the informant cannot conceptualise the ideas with his/her own vocabulary. Hence, there is need for perpetual observation during the negotiation using also debriefing, if required. Thus, occasionally the interviewer was obliged to specify the comments and narratives of the informants in order to guarantee the unanimity in the meaning of the expressions. Nevertheless, the researcher, with the help of an open dialogue, *aspired to support and encourage speaking rather than compel the respondents to use certain idioms and phrases*. The researcher found it valuable that the commentators did not hesitate to reveal critical notes, if needed.

One of the factors that can cause problems in investigations is that a certain type of strategic wording and concepts might mislead the researcher, as the conclusion can be predicted – more or less - and is consistent with the predefined hypothesis because of the formulation of questions, indicating a WUAWUG- syndrome. To reduce this kind of risk, Alajoutsijärvi and Erikson (1998, 34) have proposed a method of microlevel stories to elaborate the reality on every managerial level. The methodology is based on constructive science and is suitable because reality is a compilation of perceptions assessed by all the actors exposing themselves in an exchange process: the actors can be individuals, or firms. In this study the semi-structured method has features that are close to microstories, as the role of narratives in the interviews was very strong. Quite provocatively, the interviewer even demanded the respondents to use a lot of descriptive words in their talks (*'I listen as much as I ask'* as a request).

In general, the *atmosphere* in the discussions was positive and confidential, and generally speaking, the degree of motivation remained on quite a high level. Occasionally, after ending the interviewing sessions, some of the respondents exposed themselves to open information and experience exchange in quite a free atmosphere, thus revealing their own real impressions of the reality. These comments, though often very valuable for the understanding of the phenomenon, *were not included in the analysis*. Presumably, some of the informants did not unveil all the facts they knew partly for strategic reasons or because the bundle of their personal motives can be difficult to handle. This could partly reduce the reliability of the research work. On the other hand, many of the facts are clear and subject to open disclosure, increasing the

reliability of the entire research work. *The question of divulgation is always problematic, if interpersonal issues are to be analysed.*

Stage 6

The tasks in this particular stage were based on theoretical analysis. The researcher wrote out all the answers and responses and with the help of coding practice adjusted and specified the major categories in the typology and thus redesigned the proposed grid. It is also worth noticing that the appropriate *vocabulary was enriched by the empirical investigation*. The greatest risk in this stage is whether *the researcher has capabilities and skills to interpret correctly and promptly the material gathered from the empiria*. Since many of the ideas and definitions were created with the help of preliminary discussions using the double-check approach, it can be claimed that the risk is reduced, though can not be totally eliminated. Besides, prior to stage five, the researcher had some ideas of both theoretical pattern recognition and IM practices. Furthermore, a manuscript was created on the basis of further theoretical enrichment. Before the final thesis, the researcher sent a composition of the major results to all the respondents, and gave them the option to make suggestions for changes (by phone or email), if needed.

The aim was to associate the *temporal dimensionate* with the analysis. This required the use of retrospective data, which was gathered mainly by means of interviews. The respondents could describe the history of the on-going relationship by addressing the critical incidents. The temporality is for assessing the changes in many particular issues: the technological adaptations, the interorganisational cohesion, the evolution of stronger bonds and features of network dynamics as examples. In the longitudinal analysis, the interviewees have a chance to catch those events which have been decisive for their own behaviour. However, the respondents were very reluctant to give detailed narratives in this issue. This was due to the fact that *the IM network in Finland is a result of a very stable and innocuous progress, carrying out quite strong internal rules and norms*. On the other hand, *the identification of causality* in e.g. decision making, is very difficult to a large number of participants on different managerial levels.

The scientific orientation and the methodology are presented and contrasted in table 6.1. The shaded area represents the major focus of the research work.

Table 6.1 Positioning of Applied Scientific Methods

The Logic	Deductive	Inductive
Grand view of human Interaction	Actor - reactor	Actor - actor
Theoretical explanation	Structural dimensions, Chapter 4	Social structures Chapter 3
Metatheoretical roots	Strategic Positive, Deterministic	Behavioural Constructive, Subjective
Major theories	SCM TCA	IMP- related network view Spatial considerations
Empirical analysis Preliminary stage		Loosely constructed themes Three-step coding protocol
<ul style="list-style-type: none"> • major approach • coding 		
Second rounds		
<ul style="list-style-type: none"> • major approach • coding 	Semi-structured themes and questions Interpretative, predefined core categories	

Regarding the issues mentioned above, it may be noted that also the network view, when explaining the determinants of bonded structures, actually relies on deterministic explanation, thus defining the causative factors for the bonding mechanism.

6.3. Evaluating the Quality of Theoretical and Empirical Analysis

This study is based both on theoretical investigation added with discussions with practitioners. The methodology utilised in the empirical research work is qualitative case-based analysis having parallels with the action-oriented approach. When assessing and judging the quality of the chosen research approach (Yin 1994, 32-38, Ellram 1996, Garver and Mentzer 1999, 34) the following features have been identified and discussed:

- *construct validity*: establishing correct operational concepts to be studied; examining the degree to which a scale measures what it is intended to measure
- *internal validity*: establishing a causal relationship (this is for explanatory studies only - in this thesis the formation of long term exchange relationship is explained by two basic dimensions - structural bonding and social bonding - which furthermore have several antecedents and determinants - in general it is aimed to be more descriptive or explorative than explanatory)
- *external validity*: establishing the domain to which the study's findings can be generalised (compare to the proposal of three different domains - interaction domain,

outcome domain and relationship domain - which could be applicable in the practical analysis) or as Garver and Mentzer (1999,35) argue '*the degree to which the research findings can be generalised to a broader population*'

- *reliability*: demonstrating that the operations of the study - such as the data collection procedures, can be repeated with the same results
- *authenticity*
 - resonance*: the extent to which the research process reflects the underlying paradigm (compare to reliability and validity measures - this is one of the basic constructs in more social-oriented paradigms because of the fact that it is widely accepted that from the analytical point of view the research work should always be a reflection of the reality - in this sense the chosen methodology enables the researcher to find the basic constructs of the phenomenon that has been studied)
 - rhetoric*: the strength of the presenting the arguments
 - empowerment*: the extent to which the findings enable readers to take action
 - applicability*: the extent to which readers can apply the findings to their own contexts

In general, validity is more than quality: it is a *portrayal of the entire working process*. In this sense it includes several aspects - or as Halinen (1994, 338) puts it - the whole process including '*the adherence to generally accepted scientific values, the internal logic of the study and the external applicability of its findings*'.

To assess the *construct validity*, **two-fold** aspects can be posed: *first*, the terming in IMP- based network tenet is quite conceptual and thus very different from typical logistics practice, though extensions of the supply chain to a network has been implicitly accepted for many years. *Second*, the exchange relationships are quite complex, and - what is more evident - quite context-specified (or context-bound as argued by Tikkanen 1997). In this sense, the terms and concepts discussed are applicable in a range of analytical business situations. Explaining the causal relationships - which is considered if *internal validity* is assessed - has been partly successful. The issues proposed, though theoretical and conceptual in nature, seem to have limited relevance in practical logistical research. The terming is different but the antecedents are applicable: this means that roughly sketching, the proposals generated *ex ante* to depict the antecedents for diverse bonding mechanism seem to be relevant in the studied context.

With respect to *external validity* it should be noted that the pre-defined domain category, with three different domains has partly shown its explanatory ability. It was of primary intention to construct a general model for theoretical and analytical purposes. However, the presented model was rather tentative and hypothetical than exhaustively narrative in the details. Moreover, the external validity is for assessing the *generalisability of findings*. In this sense the constructive and subjective view for of the world means that a lot of phenomena are regarded as context- and situation-bound. For this reason the researcher should be cautious when claiming that the results and findings could be applicable under different settings. No doubt several characteristics are typical for all business transactions and exchange, but to construct a valid and uniform model for many logistics situations and manifesting this to be suitable for all purposes is of course absurd and unjustified.

One of the obstacles - which was verified in the *empirical pre-exploration* and which significantly reduces the validity - is that the social structures are quite a complex, with numerous layers, rationales, and motives; many of these determinants are hidden, dormant, latent and subconscious for the actors themselves. In order to contemplate the antecedents exhaustively and later establish the appropriate causal links is - if even possible - quite a difficult task. The phenomena can be illustrated with hierarchical onion-like layers; the researcher has access to a cover layer and to some others as well with the help of adequate methodology, but to explore the inner layers, the arena of subconsciousness and latent motives is not possible. Many details and determinants - regardless of the sensitivity of the methods and the interactive nature they have - remain as much *hidden as revealed*. This is especially true with the social structures and their impact on behaviour and responses.

Besides, the longitudinal research strategy based on retrospective data, especially when the *development of the relationships* is elaborated, increases the probability for interference, because with time the reality is often interpreted differently. This is one of the factors that reduce the internal validity of the research work. In figure 6.2 the prevalence of information exposure is illustrated; the shaded area represents an inventory of information *with no access* to the researcher.

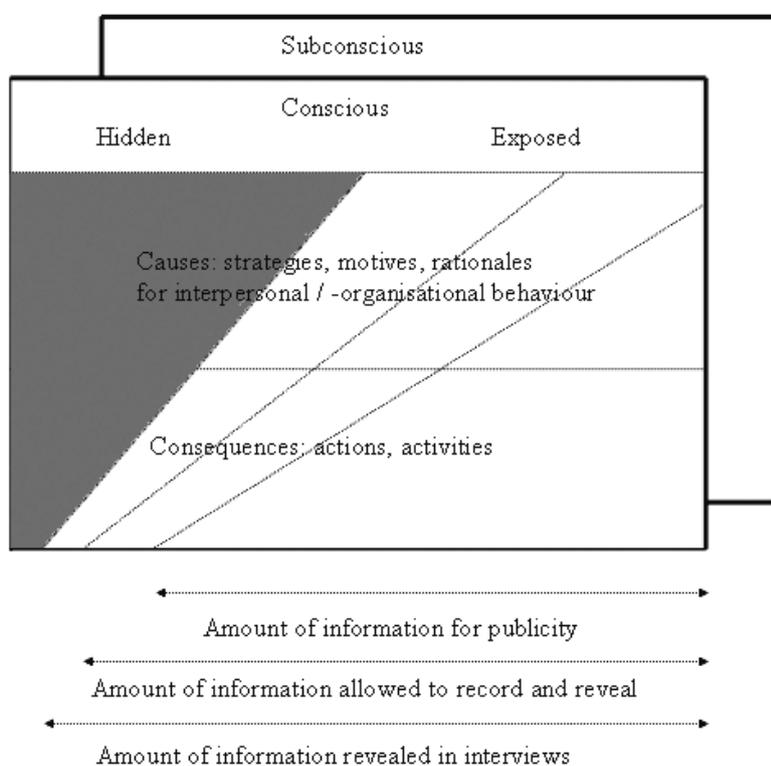


Figure 6.2 The Levels of Exposed Information during Interviews

Regarding the depiction above, not just the attitudinal factors prevent the access to appropriate data; it is evident that *some information is strategic in nature* and not allowed for public exposal. On the other hand, stock-quoted companies are very reluctant when disclosing information for public use.

In a more subjective and constructive science *reliability* is problematic: following the procedure carried out in this process identically can be difficult. At least following the procedure can be troublesome to ‘outsiders’; the writer’s own experience in the field has undeniably affected not only the questions and themes, but also the analysis. In theory this should not been allowed, but, honestly, that has been the case (in a subjectivist view in the most strict sense this is even recommended: one’s own perceptions and attitudes can have influence on the setting and contemplation; see e.g. Gummesson 1991). Besides, cautious and careful analysis of interviews is one way to minimise the number of failures. The analytical procedure was enhanced with a continuous dialogue between the writer and the respondents. This iterative and on-going process together with quite a large number of interviews on multiple managerial levels significantly reduced the number of errors. The interviewees were allowed to comment on the results before they were exhaustively contemplated.

With respect to reliability, one of the difficulties in further studies will be to capture the local net dynamics by using retrospective data in a longitudinal research. In the preliminary stage when the interviewees were asked to discuss past events, the main emphasis was on critical incidents, which are typically most easily remembered. This part of the analysis together with the results should be double-checked from secondary sources: company reports, memos and other relevant supplementary material. *Resonance* as a sub-category authenticity assesses to what extent the methodology that has been used really and extensively is a reflection of the phenomenon that has been elaborated on. As stated, the world of transportation is lives in a managerial and strategic world (executive level’s dominance over the operational or lower managerial levels in analysis). In this sense, the network ideology which stems from more organic thinking is not applicable. On the other hand, the ideas and reflections discussed in this study are general, because of the high abstraction level. This implies that on conceptual level the analysis actually captures several predominant issues and features of the network - or the local net as in this thesis.

Evaluating the *rhetoric* is not relevant in this situation; it is up to the people in *academia* and *empiria* to thank or criticise the explanations, reasons, and the contents of the entire study. Regarding this specific evaluation criterion, the researcher is always and unconditionally challengeable to comment. The *empowerment* is parallel to rhetoric: to fully apply the findings can be a bit problematic due to the raised abstraction level. However, the ideas and findings as proposed in the research work might help also the practitioners to get new insights and mindsets for their strategic decision making. It is of a great importance to understand the *logic of the network behaviour*, especially compared to the ideas proposed through strategic explanations. Consequently, the research work has increased understanding and knowledge considering this rather complex and intricate phenomenon, which has not been exhaustively analysed from the network view/approach/behavioural paradigm point of view. The typical features of the focal company as exposed in this study can generate new discussion. It was found out already during the interviews that the approach in general gave new, though theoretical,

ideas for the respondents. In addition, *applicability* can be difficult. As noted, a remarkable obstacle is the theoretical, and conceptual language and argumentation which has been employed thorough the working process; again the high abstraction level can be an impediment for utilising the findings in strategic decision making.

7. Examining the Roles through Engagement

In this chapter the different *roles of the focal actor* are discussed both in *dyadic relationships* and in a *wider intermodal network context* (subchapter 7.2.). Because of the fact that the position-role concept employs the idea of structures as much as processes, the *structural elements in terms of actor bonds* are discussed as well: one of the primary questions is *how the existing roles are reinforced by the bonds* and structurally bonded nets/network (subchapter 7.3.). Because *critical events* can trigger out a *change process*, redefining probably the roles as well, these incidents are discussed from the empirical point of view in subchapter 7.4. The actors are *engaged in networks through relationships*; the content and dimensions of this involvement are explained in chapter 7.5; a presentation of the underlying forces of the engagement is also given. Besides events as causative factors for change, also the roles include a strive for change through the actors' intentions. The change process can lead to the *desired state in the relationships*: this is examined more accurately in subchapter 7.6. complemented by examination of the *factors that prevent the development of deeper relationships* (subchapter 7.7.). Because of the consistent link between the real and imaginary processes and the two-directional influence between them (compare to figure 1.2), the *inhibitors of more effective pragmatical IFT* are discussed in chapter 7.9. Empirical analysis is used as the basis for the examination of the roles of the MTOs in general and the focal firm's activities in freight transportation (chapter 7.1.).

7.1. Multimodal Transport Operators

In intermodal freight transportation, the term Multimodal Transport Operator (MTO) is widely applied by the freight forwarders and other third party logistics service providers, when they refer to their own responsibilities as consolidators. Typical for *MTOs* is that they are engaged in transportation activities, typical for which is the movement of goods under *door-to-door- conditions*. Practically, it can be assumed that the role of the 3PLs is to give a *wide array of services by integrating a single carrier's service*, and subsequently, sell these services to the clients. It is thus evident that a single operator carrying out the responsibility of an MTO *actually takes responsibility of the whole transportation process covering all the modes*. If a single actor takes care of the IM transportation, these operators can be defined as Partial Multimodal Transport Operators (PMTOs).

In this study the term MTO is utilised in a broader manner: if a single carrier is involved in any type of multimodal transportation, it is assumed that this actor represents an MTO. In a narrow sphere, MTO as a term is denoted to situations in which a single operator is totally and unequivocally responsible of arranging the entire transportation service. Theoretically, in genuine IM business, a freight forwarder could be categorized as an MTO together with some others. It is sometimes very difficult to draw a clear line between an MTO's and a PMTO's responsibility since many of the operators provide *both door-to-door and terminal-to-terminal* (or *gate-to-gate, or station-to-station*) service. In this sense the same forwarder can be an MTO or a PMTO, depending e.g. on the destination or needs of the account.

There is limited number of empirical studies analysing railway companies in IM networks. An analysis conducted by Aastrup (2003) investigates several different actors

in railbased intermodalism in Denmark. However, the market structure in Denmark is different from the circumstances in Finland, where no combioperators are involved in IFT. The combioperators, e.g. the partners of UICC, are links between forwarders and railway companies. In the case of a combioperator, a railcarrier is responsible of providing the haulage of trains (shuttle trains, scheduled connections, or block trains) in some specified leg. The combioperator consolidates the full trains, and markets the capacity to the freight forwarders based on terminal-to-terminal- conditions. Thus, the freight forwarder actually has a role of intermodal co-ordinator, since they provide door-to-door services to the firms which subsequently purchase the transportation service. Besides, a freight forwarder can carry the risk as well. In this sense, the relationship between a railcarrier vis-à-vis a combioperator is interesting for the intermodal efficiency, though not valid in Finland, since the absence of this kind of intermediary is evident probably in the near future, as well. Moreover, it implies that either a focal firm or a forwarder, or some other operator can take the commercial risk or physical risk (imbalance between short leg vs. dominant leg).

In the research work conducted by Aastrup (2003) one actor - Railion – was actually close to the focal firm, because it was a representative of a conventional railway company. Accordingly, when using *scheduled full trains* for transporting ITUs, a railway company could occupy an important role as a consolidator and co-ordinator. Hence, the actor in focus co-ordinates the journeys, but does not give door-to-door-solutions. This specific role can be named as ‘a mule’, which refers to particular tasks *as a subcontractor*. Parallel to experiences in Finland, also in Denmark Railion wanted to expand the business by creating closer contacts with some intermediaries, as well as with the customers. However, very soon the company recognised that this attempt was not appropriate, partly because of the fact that the firm was not capable of carrying out new operations successfully and profitably. In all, VR Cargo seems to be determined to maintain and strengthen its role, rather than make new attempts at enhancing the IM business radically. Moreover, in Finland the focal firm does not fix full trains, but rather groups of single wagons in IFT.

The Railion network position is constructed with the help of **four** major elements: **first**, emphasising the role as provider of the traction in IM business taking some risks, **second**, being the dominant railway operator on Danish tracks, **third**, employing some advantages in terms of equipment and scale, and **fourth**, based on expertise and established relationships with other railway operators (Astrup 2003, 299). In all, there are **four** major tasks, or core tasks for a railway company as an intermodal operator, which the role strongly lies on: **first**, providing rail haulage, **second**, providing terminals and wagons, **third**, co-ordinating door-to-door solutions, and **fourth**, consolidating the rail traffic (Aastrup 2003, 308). Finally, the *combioperator as an integrator* is an interesting intermediary, but though sometimes mentioned in discussions, it seems that this kind of middleman does not arise remarkable interest. In Finland the volumes of transporting the ITUs on domestic tracks are too low to maintain an extra neutral operator.

7.1.1. VR Cargo in Freight Transportation

In recent years, VR Cargo as a strategical business unit of VR Ltd has gone through remarkable organisational and strategical changes. Regarding intermodalism, it should be noted that a counterpart can not always distinguish between the tasks of VR Cargo *in general* and the tasks of VR Cargo *as an intermodal operator*. Besides, in VR Cargo itself, there is occasionally no difference between ordinary freight transportation and intermodal transportation due to the fact the same principles are valid also in intermodal transportation: e.g. arranging the traction or scheduling the linehaul with appropriate time slots for freight transportation are examples of the activities employed by the focal firm. In this chapter, VR Cargo as an actor in a freight transportation network in general is characterised.

Over the last years, there has been *an organisational restruction*, which means a foundation of state-owned company (SOC) under the name VR-Group Ltd having four main subsidiaries and a constellation of different strategical entities for freight markets (VR Cargo mainly for bulk cargo, Transpoint for general cargo: also a significant acquisition by Transpoint taking partly over an ex-competitor, Combitrans). However, VR has probably not been as aggressive as the Swedish SJ in making market penetration to different freight markets (Ojala 1998). In present study Green Cargo in Sweden was specifically mentioned by two respondents as an example of a leading-edge company in rail transportation when considering e.g. sustainable environmental policies.

Practically, *more efficient intraorganisational performance* by means of *decentralisation of authority* has been a target; this also requires upgrading of managerial skills (Ojala 1998, 221). The focal firm has e.g. appointed specific liaison officers for the different localities, who are responsible for communication and customer training in international traffic. These measures ensure the continuity of the communication and collaboration on operational levels as well, which the operational success of IM traffic strongly relies on. The focal firm has created *resource ties to some of the counterparts*, which means e.g. adoption of EDI with the main partners in freight transportation and modification of equipment and facilities according to needs of the key customers. Practically, VR Cargo has undergone joint wagon projects with some key accounts. The design of new wagons for rail-road traffic, which will accommodate Eurosize articulated vehicles, swapbodies, and containers, is a good example of this. Without the assistance of the major accounts' side, this attempt would not have succeeded.

It seems that *strengthening the bonds in general* has been of major importance for the railcarrier. With the help of stronger decentralisation, the focal firm aims at strengthening *social bonds* with the counterparts by means of extended personal linking and mutual co-operation on all managerial levels. However, the social bonds have always been very important for the service provider under investigation: a strong personal involvement in the customers' processes has been one of the success factors. When organisational restructuring occurred in the beginning of the 1990's, one of the main motives to re-organise and modify the company structures was to enhance and deepen the personal relationships and to take an advantage of the decentralised

decision-making procedure. Nevertheless, organisational restructuring requires some time before it can be fully utilised.

There have also been some improvements in joint planning, aiming at working on a more strategic level with the major accounts. Apparently, the use of legal bonds more intensively can also have some strategic objectives: the long term agreements have an impact on commitments as well. Regarding the technology bond, the focal firm has introduced advanced electronic service, which consists of services for transmitting transport documents, tracing and tracking the consignments, and options for changing the schedules on-line. As a pilot project with selected counterparts, an Internet- based service for ordering wagons is under testing.

In general, the focal firm strives for a more *active role in environmental issues* by accomplishing the use of internal and external auditing. VR Cargo aims at applying the principles of sustainable development, which practically means e.g. efficient use of energy, low emission levels, and safe transport of hazardous and dangerous substances. This is significant, since according to internal surveys made by the focal firm, over 80 % of the customers considered that environmental care was a prominent factor in deciding to use rail transport. In practice, however, most of the customers acquiring a railway service are not ready to pay more if a more environmental-friendly transportation mode is used (Antikainen 2002, I). Moreover, the increased interest in environmental issues can raise the positive public image of the company. Regarding IM business, often the demand for more environmental-friendly transportation services favours the use of railways. Moreover, *better reliability* has been achieved through joint efforts with customers to reduce and eliminate the risks in transportation and inherent activities. VR Cargo employs TQM, which is a leading strategy for improving the quality of the transportation service.

There have been some *adjustments of own processes to comply with those of the counterparts*. Especially this is applied in different activities, e.g. discharging, loading, and consulting. Particularly a joint effort together with the paper industry – the VIPRO project launched in 1999 – generated practical improvements not just in the flow of goods but in information sharing as well. The ultimate goal of this project was to enable the counterparts to order a precise number of goods wagons needed for a specific port or ship. By this, VR Cargo was willing to configure its own schedules and priorities according to the needs of the major customers. The adjustments are also a precondition for the relationship: there have to be some modified and re-organised activities (e.g. in loading, discharging, fixing timetables, scheduling, improving routines and procedures) in order to ensure the maintenance of exchange relationship and to avoid malfunctions. These acts have an impact on activity structures as well. The synchronisation of the activities takes place not only on the firm level but also on *multiperson, interpersonal* level. Adaptation in general, and when confirmed with interpersonal interaction, ensures the maintenance of trust in which the question of power is also evident.

Furthermore, there have been improvements *in numerous technical matters*, e.g. marshalling yard operations and train forming: reducing the handling of single wagons and groups of wagons is gradually omitted in favour of block trains. Regarding rail-road transport, VR Cargo has built ramps, rails and loading yards needed for loading and discharging the trucks. There are also trail runs for a new wagon type, which can carry modular vehicles of over 25 metres in length, multipurpose wagons as new construction

for both ITUS and other cargo, and a prototype pocket wagon with lowered cargo space between the bogeys. Besides, the investments in some terminals improve the conditions for more effective loading and unloading (e.g. on-going activities in Oritkari/Oulu or a published pre-evaluation of increasing traffic to the North-Savo area with investments for transloading). Technical collaboration requires also the consideration of *activity links*. It seems that the activity links are means for adaptation, as they combine the activities between two operators engaged in a long-lasting relationship; the synchronisation of activities (e.g. loading, discharging, timetables, scheduling) in order to avoid temporal hindrances and malfunctions is one of the main tasks for the operators.

With respect to roles and position, *adaptations are some of the most notable indicators of the embraced roles* actors might have. Continuous adoption in network involvement is a sign of more follow-up type of behaviour; an *actor is continuously subject to unilateral behavioural alterations, without any distinct rewards*. An actor is then – more or less – controlled by another actor, because of the *obligations – not options* - this kind of behaviour has. Often, *the adoption is strengthened by diverse bonds*.

The organisational restructuring is an adaptive response to the internal and external strives a railway company is obliged to face. Several linkages – resource ties, actor bonds, and activity links – are more accurately specified and then tightly constructed with the major partners. Regarding the actor bonds, technology is one of the most important means to strengthen the mutual enterprise. Several empirical examples clearly indicate that e.g. EDI and RailTrace as adequate information technologies represent intensive collaboration means between the actors both on individual and departmental level. It seems that adaptation in general is more commonly accepted in the focal firms' performance. However, a railway company is often more a reflector than dominator in a network. The actor type of behaviour has been more common in the information technology solutions where VR Cargo has worked in a more proactive manner.

7.2. Identification of Roles

In this chapter, some interpretations of the *roles* of the railway company are explained on the basis of empirical analysis. Though clearly identified, it can be suggested that the roles are partly overlapping and the classification has blurred boundaries. Besides, an actor can have *multiple roles simultaneously in a broad network structure*. Based on the empirical verification, it can also be claimed that *VR Cargo has different roles in different relationships*. In practice, and in different transactions, VR Cargo can be both a *contractor* and *contractee* having activities, which are typical for both to a subcontractor and to a principal.

The classification criteria applied in the typology are *twofold*. **First**, is the focal firm coping with *one counterpart* (implying a dyadic relationship) or does VR Cargo *expose itself to a range of relationships with all the members in a net(work)*. The **second** criterion deals with the question of what is the *major nature and character of the actions, reactions, and interactions as responses in general*. Because of the fact that plural, diverse, and even inconsistent type of roles exist in a wider context, the classification of the role by means of a typology is a *generalisation*, and can not be appropriate in every detail. The roles as described in this chapter appear mostly in a dyadic relationship with a road carrier. Moreover, these dyads are the most distinctive

ones in railbased intermodal solutions, since a combination of two modes – rail and road – is the basis for intermodal freight. In general, the set of focal firms is rather heterogenous. It should be pointed out that a net is actually under consideration, not an entire IM network. Presumably, the *network roles are – if no totally identical - close to the ones which appear in a focal net* (for this reason the concept *net(work)* is often used).

In table 7.1 below the identified roles of a focal firm are explained by means of a typology using descriptive terms for the identified roles. The measures mentioned are simple indicators of the respective roles both from behavioural and functional point of view.

Table 7.1 Conceptualised Roles of a Focal Firm in IM Network

Outside a Focal Net		Integrator		
Inside a Focal Net				
Relationship	Proactive Measures	Interactive Measures	Reactive Measures	
Net Level	Dominator 	Common carrier 		
Dyadic Level	Principal 	Partner 	Subcontractor 	
Indicative Behavioural Characteristics	Acts Provokes Proactive adaptations Unilateral Determined Discriminative More dependent Influencer	Interacts Adjusts voluntarily Absorbs conditionally Mutual Open for all Neutral, arbitrativ More independent Neutral	Reacts Adopts Coercive adaptations unconditionally Unilateral Follower Adopter More dependent Reactive	
Indicative Functional Characteristics	augmented service production	linehaul plus complementary service	linehaul of ITUs	
IO Distance	modest	medium/short	long	

In all, the actions and reactions are different in a dyadic relationship than among web of actors (a net). Processes like adaptation and exchange, are typical of two members in a dyadic relationship, whereas transmutation and transformation appear mainly on the net(work) level.

With respect to roles, the notion of personal interaction is important; not just because it intensifies the roles more, but also because it makes the roles more robust. The following depiction illustrates the distinctive stages of this interpersonal process.

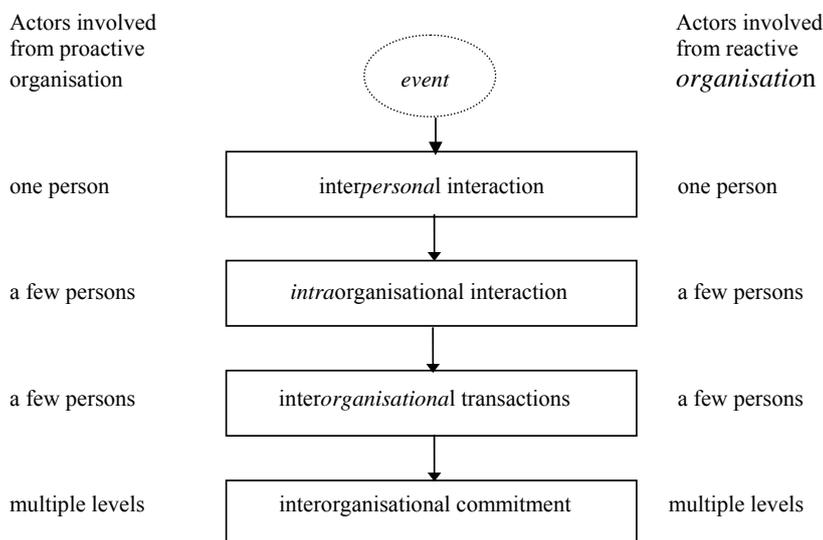


Figure 7.1 Mechanism for Dyadic Actor Behaviour

Interorganisational commitment also *refers to internalisation* of the role behaviour *on personal level*: how a person acts in his/her role (thus enacting the reality) is dependent upon how the internal norms and values are absorbed by the employees and how they convert these to their own behaviour. The analysis verifies that the actors are as often persons, or groups of persons working together as firms. Indeed, often the individuals, cross-functional teams or groups rather than firms are key players in decision - making, which stresses the microlevel behaviour and respective actions and responses. Besides intraorganisational, the teams can be interregional and naturally interorganisational, as well. This is important for the focal firm since combined transport is not an independent department of VR Cargo, but based on scattered professionalism on different market areas with back-up teams. The use of liason officers on tactical and operational level ensures the depth of co-operation in practical matters, thus reducing the cognitive distance between the actors.

Furthermore, it seems that *the organisational roles* – how a firm enacts its role - are *transferred or transacted or transmitted to the individual actors, who are more or less obliged to cope with the pattern, and later modify the needs of their firms to the ideas in mutual collaboration*. Inevitably, the individual roles are embraced by the firm's role – often intuitively and through experimentation, testing, and acceptance. Most of the

informants had a very long working history in the field (more than 5 years, often more than 10 years), knowing the focal firm considerably well, which partly contributes to the shift in the role behaviour within intraorganisational context. Generally, much of the interorganisational behaviour is *interpersonal* rather than purely interorganisational.

7.2.1 Integrator

Basically, this particular role – integrator – means that a carrier can be defined as an MTO. The megacarriers are often willing to enhance their traditional business performance with new initiatives. Thus, the conventional transportation service (linehaul in specific legs) is extended by value-adding activities. The presence of a virtual integrator is possible, though in IM chains rather from a theoretical, than from a pragmatical point of view. Moreover, the integrators are often not direct members of an intermodal freight transportation chain but rather service providers or consolidators in general. Basically, there are two different paths for taking the role of an integrator. A carrier can expand its conventional business area by taking care of new VAL activities, and subsequently provide these service packages to their own clients, or a freight forwarder strongly combines the service as provided by the different modes, and sells the entity to their own clients, which implies to consolidation. For this reason the role of the integrator is located outside the focal net in table 7.1, though theoretically a focal firm as a megacarrier could radically expand its IFT business within a net.

The role of the service integrator is interesting, since it is assumed that this role is not truly performed by *any* operator in the IM business (cf. Gröhn 1998). Conventionally, the tasks and liabilities associated with this role are mostly connected to the freight forwarders, often also called consolidators, or NVOCCs. The practice of one-stop-shopping also refers to freight forwarders in their attempt to expand the business opportunities. Though of great interest, this particular role is not suitable for VR Cargo due to various reasons, starting from the idea that there is no clear, visible, and public statement from VR Cargo's side to support this type of a situation. On the other hand, no one of the carriers and participants on domestic IM can be regarded an integrator since the use of the service provided by freight forwarders' is not needed in national service. In eastbound container service, the freight forwarders task is to give a spectrum of service; however, *freight forwarders then consolidate the activities rather than integrate them*. As a megacarrier, the operator takes care of an array of activities offered conventionally by the consolidators. Practically this means a combination of conventional transportation activities and value-added ones requiring an integration of the services.

When the theme of an integrator was discussed in the empirical analysis the respondents were rather reluctant to give responses because the *lack of a real integrator is probably evident in the focal net*. Besides combioperators' also globalised forwarders or megacarriers can be classified as integrators. A railcarrier's capability is limited and the resources are scarce for this role; on the other hand it is not a major aspiration for the firm either. A liner shipping company and the shippers (while creating chains for in-house operations) or the receivers can occupy this role, depending on the leg and the critical points for dividing the tasks.

One of the prerequisites for the role of an integrator could be an own information system, either totally independent or integrated to some parties' information systems.

Knowledge can be one of the major intangible resources for starting to integrate the IM chains. Though a dominant actor is presumably not evident in IM business (which is in accordance with the proposals of the network view), there is need to co-ordinate the processes. Co-ordination (e.g. in information sharing to ensure better responsiveness, creating more appropriate balance in domestic northbound/southbound traffic) can be even crucial for the integration of diverse tasks in order to ensure more harmonious and smooth operations.

7.2.2. Dominator

With this specific role a railway company attempts to be a leading-edge company in some specific field, thus provoking the net members to substantial configurations in their practices, regardless of the fact that a dominator often takes the full advantage of the initiatives; this is both an injunction, an imperative for the operators, and a unilateral action. This is often not consistent with the internal norms and practices once created, implying strong hierarchical governance. Significant is the notion that this role can be apparent for all the network members. Despite the focal firm's interest e.g. in developing EDI-based solutions, the role of a dominator was not clearly found out.

Though theoretically an obligation, there is also a positive aspect of this role. A dominant role in a chain – if coupled with a subrole of an initiator – might *generate positive attraction* among netmembers for improvements and new acts. Especially the stakeholders agreed that a focal company should capture a *more active role* in terms of investments, resources or other commitments.

In order to characterise this type of behaviour, it can be claimed that the focal actors attractiveness is high. Hence it absorbs interest, which is mostly a positive phenomenon. Nevertheless, a dominator can also be non-attractive or non-appealing because of the strong relative bargaining power over a large number of network members. An actor can trigger out either positive or negative development. Accordingly, this specific role demands a recognised prestige, supremacy, and superiority; authority is thus generated with the help of a positive image and reputation. Other typical features are size, power, technological prominence, and strong network identity, which all awake interest among other participants and operators. The use of RailTrace and advanced solutions in EDI-messaging are examples of the prominence.

Overall, this specific role could also be connected with the public image, since the role requires a strong identity perceived and accepted not only by the members of the focal net, but also by the supportive actors and stakeholders. With respect to environmental issues, VR Cargo could be more proactive in their activities of making new initiatives which could later lead to new solutions. The European Union's attempt to transfer some of the road transportation to railways could require new types of actions from the focal firm's side (e.g. computerisation of the total impact of the transportation in different legs). Inevitably, right now most of the end-users are not willing to pay any extra freight rates because of the increased environmental protection (e.g. reducing harmful environmental impact). This is important, since VR in general has abundance of information in railbased transportation; there are hardly any other institutions or organisations which could give as much information of the railway traffic than VR. Furthermore, the proliferation of knowledge is not probable in the near future. The public debate could thus be enriched by the initiatives made by the focal firm.

Presumably, and putting together the sanctions created by the Union or the government and the focal firm's stronger grasp could change slightly VR Cargo's present role to a dominator.

As a dominator the railway company could try to stipulate internally and unilaterally the norms in the IM network. Other operators try to avoid or elude the collaboration, which is often not possible, because of the fact that the focal firm rules the business under consideration by means of an overwhelming technology, excellent capability, superior reputation and image and state-of-the-art- performance e.g. when coping with environmental issues.

The role of the dominator is based on power. Indeed, some facilitators in the network are leading edge ones while others benchmark and gradually adopt the advanced technology (e.g. computer based solutions for tracing and tracking, like RailTrace, EDI, or similar mutual primary technology) carrying out technological prominence. In this sense the implementation of these technologies can cause reaction among the net members. The impact of EDI-based solutions on power could be multi-dimensional. It is evident that shippers do not have any unilateral power; typically they give carriers the mandates to adopt EDI. It seems that carriers have to adopt EDI because shippers expect the carriers to do so and the carriers are obliged to act proactively; on the other hand the survey by Williams (1994) indicates that in many cases actually the *shipper is using greater power than a carrier*. Moreover, sharing the power equally and multilaterally is not evident. If so, *an asymmetric sharing of power* in a relationship is often the result. The question of asymmetry in general causes a lot of challenges for role analysis as well.

7.2.3. Principal

Though principal is mainly a legal concept embracing the importance of the contractual bond, in this study this particular role is defined differently. It is *a determined and proactive course of action in a dyadic relationship, in which the railway company either strongly and unilaterally or modestly influences the decisions made in the relationship*. Moreover, the network member is *recurrently, more or less, or slightly obliged to adopt certain type of activities or practices in order to ensure the continuity of the relationship, thus indicating compliance*. On the other hand, and especially in the long run, there are *lots of benefits and rewards for another party as well, making this kind of relationship appealing and raising the attraction*. Furthermore, it is also assumed that the counterpart considers the propositions and initiatives as they are; these suggestions are later converted to new activities. Hence, the relationship once created is *asymmetric* in terms of bargaining power, control, pace in developing business relationship, and governance, bringing better outcomes for the principal. In general, the term contractor could be utilised to describe one party's dominance over the other.

In this study it was found out that this *role was not prominent*, since the role of the focal firm is so strong that to move the role to a different position is difficult and often not even aspired to. A radical change from the major roles would require huge rearrangement of many other positions in the IM network, which is neither attainable nor reasonable in a short run. The role of the principal appears when a railway company invests on new resources (e.g. new buildings in railway wagon technology), and improves the performance with the help of the service providers. Recently, VR Cargo

has increased the volume of the subcontracting with a limited number of parties. However, this kind of activities are often not generated by the intermodal freight only, but is common for all the types of services provided by the focal firm. Then the role of the principal is more often typical in general cargo freight, and not so significant in IM solutions.

Operationally, however, this role is evident, when the service provided is supplemented by other carriers. Transpoint as a subsidiary has many subcontractors. Furthermore, in the empirical investigation this role was found when the pricing policy was under consideration. Nearly all the interviewees claimed that VR Cargo *rather unilaterally stipulates the freight rates*, and the operators have little influence in this. This is especially true when the focal firm announces increased tariffs.

7.2.4. Common Carrier

The term common carrier has many connotations, depending on context where it is applied. Mostly, it is a legal concept in jurisdiction, e.g. where common law- doctrine gives a solid basis for legal matters. In this thesis, however, the term denotes a role having some characteristics, and the respective indicators. It was verified that the *status of the common carrier is a major role for a focal firm in the net* context and presumably in the IM network as well. This specific role can be even a reflection of the network identity. Furthermore, the role defined in this way is strongly in accordance with the expectations perceived and declared by the focal netmembers in the interviews. On the basis of this specific role, the focal firm *expresses its involvement* in the IM network.

Some factors shedding light on the typical features of a railway company as a common carrier were found in the empirical investigation. A two-fold classification is made of these factors: either the typical features are an outcome of the focal firm's own decision-making and the intentions incorporated into them, or there are external constraints.

Internal Intentions and Aspirations

First, *there is a robust manifestation from the top management and executive that the principle is of strategical importance in VR Cargo's vision*, which implies a *strong commitment to continue in the chosen course of action*. VR Cargo is determined to develop its operations in the business area in which the capabilities can be most efficiently utilised. Hence, the role is also in accordance with the strategic outlining made by the Board, because it is supposed that this ensures the highest profitability and best customer service in the long-run. Because of the vision addressed, the *probability for conflicts of interest is reduced*. The fear of a collision of interests seems to be very considerable among the members of the network, especially between two common carriers. On the other hand, many of the respondents argued that there is no clear and visible sign or message of the goal mentioned. Though accepted by the focal firm, the netmembers often mentioned in interviews that it is not clear whether VR Cargo is *truly committed* to the development of its own IM business.

Second, *typical for the focal firm is rather stable and predictable managerial and organisational behaviour, and respective policies* (e.g. in terms of freights rates, schedules, routes). In order to maintain the neutrality, the railway company is

determined to modify their pricing policy in a quite modest way. Besides, and considering the organisational issues, same persons have worked in the same job positions, which increases the confidence in interorganisational behaviour. There is a cognitive bond between the operators, and through this they have rather deep understanding on each others' business, which can be an assurance for future cooperation. Though anticipated organisational behaviour is highly important for the focal firm's network identity, the huge increases in freight rates have lately weakened some partners trust on the focal firm, especially if the motives behind the actions or the major reasons for the increases have not been unveiled. Most of the interviewed persons claimed that too high volatilities upwards in the pricing policy are not justified. Because of the fact that the cost of the service – having an appearance of price - is strongly accentuated in the decision making process, the openness is highly appreciated, which strengthens the positive side of this particular role, because some other modes use different kinds of freight making process; e.g. in liner shipping industry they often use additional, and surcharges for increasing or adjusting the rates. The use of CAF, BAF, and PCS are a rather typical and a vital part, when freight rates are determined. Though harmful for the clients, by doing this the shipping company clearly expresses the reasons for the increased rates; the announcements attached to the use of additional is one way of justification as well.

Third, *some cross-subsidisation exists between the services in freight transportation.* Because of the fact that the pricing policy absorbs – at least theoretically - the idea of constant, smooth, and predictable development, it is a necessity to accept the idea of cross-subsidisation, which in practice means the principle of smoothly equalising the announced freight rates. On the other hand some of the services have higher margins than others. Some of the informants were claiming, though, that the extent of cross-subsidisation might not be as strong as it used to be; this was one of the explanations for VR Cargo's policy, when sharply raising the freight rates. On the other hand, the focal firm totally denied or ignored the use of cross-subsidisation, mainly because of strategical reasons.

Intentions Exposed to the Other Members of the Net(work) and Provoked by Internal Aspirations

First, it was generally accepted by all the informants that the focal firm is neutral for all the operators. This characteristic practically means *that VR Cargo is open for all the network members, and willing to enhance and strengthen the collaboration.* More specifically, and because of the role's obligations, *non-discrimination between customers is accepted as a prominent course of action.* In this sense, *the degree of autonomy is quite high, expressing, however, that the focal firm understands its dependency on others. In other words, VR Cargo is more autonomous than independent or totally dependent on others. This state can be appealing e.g. if new players will try to penetrate into the IM business.*

Second, *all the accounts are intended to be equal in terms of customer satisfaction.* Continuous customer analysis gives VR Cargo practical tools for monitoring changes in the business network. Unexpected events often cause remarkable extra efforts. However, all the customers get same service regardless of their size or position in the network. Moreover, *the portfolio of service is limited* and quite narrow, based on full utilisation of knowledge and capability in rail transportation. The main emphasis is

on creating value-adding services by efficient use of the resources at hand. This implies an admission that a railcarrier cannot offer a wide range of services because of the stable role. However, it seems that most of the counterparts value the array of services offered by the focal firm. This gives an impression to the other members in the network that VR Cargo is not a threat, because it is *not* trying to achieve a totally different position in a network.

An aggressive expansion in tasks might be a source of a conflict and limit the opportunities among the operators. In short, and putting emphasis on the operational side of the transportation, VR Cargo takes care mainly of one part of the entire transportation chain: a specified leg with the traction of ITUs on railway cars.

Third, there are some typical characteristics for a common carrier, based on resources. Because of the fact that VR Cargo transports a wide array of consignments and uses different types of ITUs in the haulage, it is of great importance to *utilise a limited number of basic equipment* if profitable performance is targeted. However, this reduces the opportunities to expand business with some of the operators, because a new type of business could require a lot of customer-specified modifications. VR Cargo has made a decision to offer just a few basic and multi-purpose wagon models (the modules) for the clients in the IM business. Moreover, the focal firm has clearly announced that it is not willing to expand the business; it aims at avoiding conflicts by refraining from new business enterprises.

Fourth, VR Cargo seems to be *open for all initiatives regarding e.g. common technology and other development applications*. Some of the recent technological improvements – e.g. the use of EDI – are widely applied by all the members, who receive clear benefits from them. Besides, it seems apparent that many of the operators are ready to invest on new types of solutions because of the gains. Furthermore, it seems that the railway company has a great flexibility when responding to new proposals, which has even increased recently.

Fifth, the degree of openness in information disclosure tends to be substantially high. *Principally, the social, communication, and cognitive bonds ensure that the counterparts have rather deep information of VR Cargo in general, and particularly of its performance in intermodal transportation*. In railbased intermodalism the number of organisations and people working there is limited, and mostly all the actors know each other very well because a long working experience in the field. Besides, *joint teams*, e.g. with clients like UPM Kymmene, *give plenty of opportunities for deep and multidirectional communication*. *For information dissemination it is important to what extent the actors expose themselves in situations, where overt and undisguised communication exchange is possible*. A majority of the informants *shared the idea of rather open information disclosure, though based on informal communication on multiple organisational levels rather than information made formally public*. According to some of the informants, however, *the involvement of the focal firm in public debate is not strong enough*.

Sixth, regarding the legal considerations, *there are no exclusive or discriminative agreements or arrangements with some of the actors in the network*. It is clearly announced from the focal firm's side that no restrictive contractual bonds are allowed with any of the counterparts, *though, e.g. Transpoint is a subsidiary of VR Ltd and some*

of the accounts road transportation are more important than others in terms of revenue flow. Furthermore, VR Cargo has established no partnership arrangements with any of the participants of intermodal industry. In order to maintain neutrality, it seems clear that there is no substantial risk or reward sharing with any of the counterparts. It was verified that the question of sharing in general, and synergetic effects in relationships are not evident among the netmembers. Some of the informants representing road transportation claimed that with the road carriers the situation can be a bit different, since the relationships are more *personal* with them. This indicates that the losses are more likely to cause some effects on the counterparts, if the partner is some other company than VR Cargo.

With and through Other Actors in the Net(work) by Means of Multilateral Dialogue

The performed adjustments – whether technical or behavioural - intensify the captured role. In general, adjustments are strongly incorporated to the role mentioned as is presumed that the focal firm should have not just the ability but also a willingness to pursue certain slight adjustments to the activities, thus increasing and reinforcing trustworthy behaviour. This is also an assurance for the network operators that the focal firm is committed to accomplishing the chosen course of action. There is amplitude – *an area of expected behavioural variation* – for the anticipated and accepted behaviour (see also figure 7.2). The operators may perceive negatively situations where non-expected behaviour occurs in the network context. Overreaction tends to reduce the trust, because it could be a sign for the other operators that the focal firm is not totally committed to its mission.

Furthermore, there is history: as often noted, relationships are outcomes of a long history having past, presence, and future. In IM business, the number of new entrants is limited, and most of the organisations as well as the human actors are well-experienced in the field.

External Constraints

The role carried out by the focal firm is also *an imperative from Finnish Competition Authority*, which takes care of the public control; hence, deviations are not accepted. VR Cargo is in its IM operations subject to public surveillance, interference, and inspecting which implies a pressure from the stakeholder's side. This requires a well-established cost analysis scheme, which reduces the belief that the focal firm in a semi monopoly position could exploit unilaterally or abuse or misuse the status given.

Besides, despite of the suggestions by the MINTC for opening the Finnish tracks for free competition, *VR Ltd. is the still a sole operator in railway industry.* Though having a monopoly in railbased service, the vital and fierce competition with the motor carriers

and other modes enable a degree of rivalry. Partly because of this role and also because of historical reasons, the focal firm *occasionally* behaves in quite a neutral and sensitive way with its present counterparts. Through this, VR Cargo's reputation as a reliable and potential partner gives more strategical space for expanding the business with the collaborators.

According to some of the actors, VR Cargo *is maybe not so much determined to be a common carrier than it used to be or it sometimes should be*. The freight rate policy applied recently by the focal firm reduces interest among some of the operators to develop rail-based solutions. Besides it is assumed that this kind of practice might weaken some of the business relationships, possibly later leading to total dissolution. From operative point of view there might not necessarily be any particular need to use the transportation service provided by VR Cargo since the rivalry ensures the extent of alternative sources in procuring services. This is a risk for the railcarrier, specially if – and recently also when - the competition in the transportation industry has diminished the freights in general. Inevitably, the existence of several bonds (social, communication) ensure the continuity of the relationships, which in that case do not comprise the IM business anymore.

Though important and promising, *the volume of intermodal business is a minor part for the focal firm in freight transportation*. Intermodal transportation has expanded during the last decade very modestly. This implies that openness for all kinds of new solutions, and e.g. to initiatives suggested by new potential entrants, is required. The principle can be an assurance to utilise the new opportunities more fully also in the future, because the focal firm is not constrained by any restrictive or discriminative arrangements or practices with some of the operators.

Table 7.2 presents the different dimensions of the role of the common carrier, when performed by the focal firm. The solid arrow represents a strong influence, the dotted one weak.

Table 7.2 Characterising the Railcarrier as a Common Carrier

Role Entity	Enabled by	Constrained by
Focal firm	Strategical importance Stability in terms of policies - organisational - pricing ↓	Sole operator - exclusive right for transporting goods by rail
Focal net / network	Neutrality - equal treatment of operators - information disclosure - limited portfolio of services - common technology (e.g. EDI, RailTrace, fleet design)	Expectations - no or limited acceptance for radical shifts in activities, policies or behaviour

Though Anderson *et al.* (1998) claim that the role is actively and subjectively formed by the focal firm, the railcarrier as a common carrier does not support this. The focal firm is heavily constrained by its role as defined by the public authority that there are a lot of limitations for this subjective matter. Moreover, not just the expectations created by the focal firm solely influence the role behaviour, as the *collective expectations* generated by the operators and reinforced by the structural elements in the IM network affect the behaviour as well. Because of this the railcarrier is obliged to maintain strong neutrality in terms of the policies as well.

7.2.5. Partner

If common carrier was rather evident for the network relationships, the term partner is launched to describe reciprocal co-operation under *pairwise relationships*. In this study partner is a concept which denotes *equal collaboration between a focal firm and a counterpart in a dyadic relationship in terms of risk sharing, investments, and efforts*. Consequently, many of the relationships are actually *dyadic in nature*. It means that though a common carrier is an expression of a network identity, this network role is also a basis for arranging dyadic matters. The characteristics of the common carrier type of behaviour are transferred to the role of a partner. The focal firm's counterpart presumes that the principle and policies that are prominent in a common carrier, are also valid and applicable in the dyadic relationship.

Often the outcome of a long mutual interaction means that the partners gain a certain degree of stability, which means, however, that both the potential rewards and losses are present simultaneously. A collision of interest is natural especially if the partners represent potential rivals in the long run. In this thesis - and referring to the role of a partner - co-existency and co-makship as optional outcomes of interorganisational processes are depicted in table 7.3.

As noted, the roles are based both on the relationships created in interaction and because of the structural elements in the IM network. It is worth noting that the chosen *theoretical approach influences also the content of the explanation as well*. As regards the differences e.g. in the relationship creation procedure under two different views, a dualistic structure is presented in table 7.3. The proposal in which the theoretical analysis and empirical research work is synchronized, explains the dyadic relationships *between a focal firm and its counterpart, if the focal actor carries out the role of the partner* (VR Cargo vs. other IM operator).

Table 7.3 Explanation of Dimensions of Partnering under Managerial and Network Views

	Managerial View	Network View
Deepest form of cooperation	Partnership	Co-existency (complementarity) Co-makership (compatibility)
Nature of the strategical decision making process	APDIC -formal stages -a scheme created <i>ex ante</i> for implementation	Organic -bundle of fragmented events in common history -an explanation made <i>a posteriori</i> for comprehension
The major idea of cooperation	Win-Win Sharing risks, rewards and yields	Harmony Not necessarily equal sharing Win-loose occasionally Also preventing loose-loose situation to avoid open conflict
Nature of major interorganisational processes - exchange - coordination - adaptation	Mainly economical for profits More hierarchical and formal Rather adoption	Multitude for progress also More informal and subtle Adjustments and adaptations rather

Although often otherwise claimed by scientists, the empirical evidence supports the idea that the *win-win situation is not* always appropriate for describing the ideal state of a relationship. The relationship can be valuable for both parties in dyadic relation without open manifestation of mutual rewards. Simultaneously, both constructive and weakening forces are evident. It is suggested that it is not a question whether there are *either* constructive or harmful effects in a particular relationship; actually *both of them are evident* and appear simultaneously, though occasionally there is one effect over the other (e.g. no conflict of interest, vs. conflict of interest). The forces that influence the engagement in general are discussed in closer detail in subchapter 7.5.

Furthermore, though there are some joint efforts in the pairwise relationships (and the co-ordination bond as well), co-ordination is often also hidden in nature. Inevitably, the network role of the common carrier *affects the role of the focal firm also in a dyadic relationship*.

In order to describe the *strength of the relationships* under the network view, **three** different kinds of definitions are proposed. **First**, in this study, and from the focal actor's point of view, *partnership* refers to an agreement with some of the major accounts – often tied up with a contractual bond - in which the parties decide to co-operate more closely. In this sense it is rather an outcome or a result, which is based on one actor's strategic decision making to proceed a manifestation rather than a state. Besides, it is an expression of the strategic view when dealing with the deepest form of co-operation.

Second, in a dyad, *co-existency* is state of interorganisational harmony and balance resulting from a long common history. The state is often perceived and defined after common events and joint experiences; the incidents can be both positive and negative ones. Often the state is reinforced by an array of bonds, and in the long run collaboration leads to bonded structures between the actors involved. However, contractual or legal bonds are not as apparent as some others, especially social, technological or time-based bonds. Accordingly, this supports the suggestion by Dubois (1998) when she claims that a low degree of formalisation is typical for the relationships. It seems that the partners do not apply formal agreements for balancing uncertainties or handling disruptions. Regarding the network context, co-existency is typical between common carriers in structurally tied-up IFT when they trace for concord, and when the new positions are either *undesirable* (e.g. because of low profits) or *unattainable* (e.g. because of internal and external constraints). **Third**, *co-makship* means working together in some reasonable and practical activity; this state is typical between contractors/contractees and subcontractors in structurally bonded IM networks.

7.2.6. Subcontractor

In this study *subcontracting* refers to unequal distribution of power, despite of the fact that in general the term has a very strong legal connotation. Under these circumstances, the counterpart explicitly or implicitly presumes and even insists that the activities (also acts and episodes) made by the focal firm are more or less *reactive in nature*. Accordingly, the focal firm continuously responds even in a slight manner to initiatives made by the network member. There is an expectation that VR Cargo should adopt new kinds of solutions if willing to co-operate in the long run. These reactive measures are a necessity, since a collaborator expects some form of a signal, because of their own proactive measures. In the embryonic stage of the relationship, there are some discrete transactions, but later both parties express willingness to co-operate more closely. Later, the integrative efforts are an assurance for deepening the liaison. Because of the long co-existence, the roles are stable, and they indicate an asymmetric relationship: the utilisation of end users solicited feedback is based on interpretations made by the contractor, who then converts the needs for new business performance, and stipulates the conditions of the co-makship for the focal firm. The IM service provided is thus indirectly affected by the final customer. It is possible that with the same client VR Cargo is both the subcontractor, or contractee (e.g. providing linehaul service for container transportation) and contractor (e.g. buying delivery service in short pick-up deliveries). In the case of VR Cargo, this role can be explained with the help of following characteristics.

Generally, *a railway company has no direct contacts with the end-users; these contacts trigger out the need for transportation* (compare to commercial relationships in figure 6.1). The firms procure combined transportation service have negotiations with the road transportation companies, before making a contract of carriage with them. After this, the road carrier has negotiations with VR Cargo and the terms and conditions for a railway leg are negotiated. A road carrier has two options: either to use the railway transportation provided by VR Cargo or transports the ITUs directly from the point of departure to the final destination with their own fleet. Subsequently, the railway company has to modify its own activities in accordance with the conditions stipulated by the road carrier. Occasionally the railway carrier has no accurate information on who actually is the end-user (receiver) of the intermodal transportation freight service. The focal firm is indirectly influenced by the end user.

In combined transportation, *most of the equipment development projects have been initiated by the road carriers, often based on the needs of their own customers*. Despite of the fact that mutual co-makership is often resulted, the stimulus for a new business has started from the network members' needs. Hence, it is more or less an obligation for VR Cargo to adjust the resources to these requirements. In short, the network member has been the precursor or initiator making suggestions, whereas the railway company has made coercive adaptations to ensure the continuity of the relationship.

Regarding the legal bond, and the considerations attached with them, the *contractual bonds with the road carriers have many tangents and collisions, which are in accordance with the respective roles: the principal and the contractee*. Basically, there is no formal written contract between the focal firm and a road transportation company, because of the fact that the transactions are based on offers and acceptances. However, some agreements exist due to the common wish of both sides. Though not exposed during the empirical analysis, the agreements have parallels with the idea that VR Cargo is a contractee, and a road carrier is more or less a contractor, or principal.

In intermodalism, *the railway transportation service as an activity is based on the technical solutions of linehaul complemented occasionally by loading, discharging, and terminal operations*. Though prominent, the scope of these activities is limited to one part of the logistics in the entire supply chain. In the beginning of 1990s, there were some informal discussions on how to expand the business area by giving new type of services; however, these deliberations caused no strategical actions, because of the various obstacles: e.g. it was assumed, that some of the counterparts would perceive these new initiatives as hostile. Later there has been no discussion of this matter, which of course indicates how difficult it is to change the role in a stable network without concrete performance or preliminary piloting.

In its international IM business, the *railcarrier has a limited geographical coverage*, which means engagement in national service. The eastbound container traffic from the Finnish Border station to the receiver's premises is provided by the freight forwarders; VR Cargo is responsible of the pre-carriage on the first leg from a base to Vainikkala, which is the domestic destination. However, this practice is in accordance with the commercial practices the shippers and consignees often have: the use of the DAF term and practice is mostly applied under outward transportation. Considering e.g. SeaRail and Finnlines as partners in international traffic, VR Cargo has bilateral contractual

bond with them, demanding the focal firm to arrange the pick-up, linehaul, and delivery of loaded and empty wagons from the point of arrival to the point of destination in Finland. Both in west- and eastbound traffic freight forwarders integrate the service provided by the single modes. Hence, the focal firm can not give door-to-door service for their clients but works as a subcontractor instead.

7.3. Roles Reinforced by Bonded Structures

In this section, bonding mechanisms, the question of inertia, and their impact on the roles are discussed. As noted above, structural bonding strongly influences the roles, and also makes them more robust. Also external constraints influence the roles. One bond can contain several dimensions: regarding e.g. an economic bond a single actor can refer to the price of the purchased activity, while others treat this single bond with an extended perspective by assessing the total cost of the ownership when acquiring the service. Besides, it is possible to configure the bonds with details: e.g. the communication bond does not include only personal face-to-face communication but also the facilities and applications to create more efficient interaction. However, communication does not mean just how often, but also to what extent the communication is applied, and what is the richness and magnitude of the argumentation, when e.g. new proposals are under consideration in a dyadic relationship. In this sense, there is depth of in single bond as well as width.

During the discussions the informants mentioned many single bonds. The most important ones were the *economical, knowledge-based, and communication bonds*. It was also verified that the counterparts are strongly engaged in the expected pattern of behaviour reinforced by a multitude of bonds. There were often great expectations for VR Cargo e.g. in terms of contracting, timing and scheduling, which refers to the co-ordination bond. Though tied up with this type of expectations, this was also one of the main *sources of trust*. Opportunistic behaviour was often regarded as a threat causing doubts and uncertainty among the network members. Hence, the bonds reduce and sometimes eliminate the threat of opportunistic behaviour especially when strong structural bonding is evident within the IM network.

The *economic bond* was the most widely identified single bond among informants. This included the freight rate of the service acquired by the counterpart, attached by the justification of doing so (communication bond). According to most of the informants the focal firm should make a clear correlation between the expenses of service production and the applied freight rates. The total cost of ownership tended to be more important: not just the freight rates charged by VR Cargo, but also the expenses caused by delays or inefficiency can be remarkable since these cause cumulative disturbance and hidden costs for the counterpart. However, it is possible to maintain relationships without an economic component e.g. with the supportive actors; the stakeholders' interest is to create opportunities for more effective service production. Consequently, they are willing to control the intermodal business by indirect means. With respect to total acquisition costs (TCO), the question is also whether to produce the services internally (e.g. transportation of goods by road vs. use of railway linehaul), or to manage the resources externally. From the shipper's point of view, in theory it is possible to use their own fleet (to make), though practically this is not evident; service providers are mainly employed (to buy/outsourcing). Undeniably, the forwarder or some other facilitator like a port operator can hire or buy service facilities from other

operators, carriers, or subcontractors when seeking for higher productivity. However, in this study the role of service providers was examined, not the role of shippers or consignees.

Legal bonds were mentioned, although, as revealed in the theoretical part, actually they seem to be less binding than they appear. There seems to be dominance of some other bonds over the legal ones, though the contract is always a cornerstone of the practices and inherent documentation.

The *technical bond* can be important in a limited sphere, though it can be regarded at nodes and interfaces; e.g. with the help of the cooperation the operators look for better-working solutions for transporting the module trucks, including the efforts for efficient loading and discharging. Furthermore, readiness to listen to the proposals made by the focal net members and discuss the matters, whether they be relevant or not, was perceived outstanding. Process adjustments are connected with this bond, including the matching of the technological solutions. In general, *the progress of intermodal service production is subject to improvements in technical matters, implying interoperability.*

The use of the *cognitive bond* is notably high: knowledge of the counterpart is often linked with every single episode or transaction, which means that it can be regarded as a relational one. On the other hand, *settled attitudes* based on the historical record might hamper the utilisation of innovations and suggestions for the improvements; an issue which was particularly claimed by the focal firm. The counterpart might interpret the single acts and situations generated through short-term episodes in general in his/her own way based on earlier experiences.

Social bonds seem to be more and more remarkable in the IM network. Focal firm's internal strategic decision towards more decentralised decision-making was found crucial in operational matters. The local marketers and the use of liaison managers strengthen the relationships if these employees have more rights for decision-making and responsibility. Besides, with the social bonds, mutual norms for collaboration are created, which reduces the risk of misinterpretations of the state of the affairs. *A common unilateral agreement on the preferences* of the remarkable issues seems to be important. Moreover, social bonds are reinforced by communication, though they do not replace the economic bond. Some of the informants argued that road transportation is sometimes regarded as more locally-oriented, because of the fact that the use of road transportation could be more favourable for regional development, especially if the supplier of this mode is a representative of an SME and is a vital link in the social net. The local identity may encourage the purchasers of the transportation service to acquire road transportation instead of rail cargo service.

A *planning bond* was mentioned, and with some of the operators it was appropriate for the relationship, though not so notable as some others. The focal actor should be sufficiently reflective for the proposals made by the counterparts, considering the elapsed time between the episodes as well. In all, there is not just a single bond or a bundle of them, which influences the state of the relationships, but also the strength of each bond and its extent are important: e.g. the planning and timing bonds were often inherently associated with other bonds.

The time bond as a form of responsiveness can be of modest importance. The time distance is not connected with the movement of goods only, but also associated with the elapsed time between single acts or episodes; e.g. the time between negotiation meetings or the time between promises and reactive responses to them. Hence, the time distance has an impact on the social distance as well.

Furthermore, there can be *relationships without economic or legal bonds*: a single bond, like communication, can keep the relationship going without any business exchange. There was evidence that a railcarrier is a necessity for intermodal transportation, because a diversity of modes is needed to ensure competition and alternative sources for service production, and for progress in general. The members of the network need the service offerings provided by the focal firm, whether they actually use them or not. Commitment expressing a relational bond is also associated with social and technological bonds: in the network under consideration, in which inertia is evident, the bonding mechanisms are divergent in nature and various bonds are strongly linked. As mentioned above, the planning bond is inherently coupled with the time-based one: an idea for improvements requires quick responses as an assurance of trust and commitment. Planning is also associated with the technical bond.

It is neither possible nor desirable to maintain numerous bonds with every counterpart. It was verified that the more attractive the relationship in the IM business was for an actor, the more there were the identified bonds as well. With the help of numerous bonds the actors also define their roles: the cognitive bond was a major tie for analysing and defining the focal firm, although as noted, sometimes the perception is based on attitudes rather than on facts. Besides, the core actors are tied up with multiple bonds, while less bonds are evident with the outer surroundings. Consequently, several structural bonds have quite a strong local connotation, implying proximity of the actors. Furthermore, the concentration of the decision makers to a quite small geographical area (the capital area) in the IM business means that remoteness is not a substantial problem. Consequently, it was verified that the network is structurally bonded; there were really no partnerships in the network under analysis. The concept *partner* was used to *describe the atmosphere* of the pairwise relationship rather than to explain the details of the arrangement, thus referring to legal or contractual bonds. Furthermore, a strong relationship is thus more a *question of statement* than a *formal description* of the details of a strategic plan.

The bond of communication is also important from networking point of view. As mentioned above, networks are sets of relationships rather than sets of actors. Also the networks – and specially the nets – are also *sets of responses and reactions*. With the help of the two-way communication the actors ensure the continuity and consistency of the relationships. Without responses - whether these are negative, neutral, or positive – the actor expresses a willingness to proceed with the common enterprise. This is especially true with the exchange relationships, in which the value creation logic is embedded in the exchange. Moreover, much of the practical net creation is based on the use of social nets.

Considering the *inertia and structural elements of the relationship*, the IM network is a result of efforts over a long period of time, and the division of tasks is based on traditional conventions and internal norms created within the net(work). Due to this quite a strict division of tasks, just a limited number of overlapping activities exist.

Each actor concentrates on their core business, and the division of activities is based upon complementary and non-substitutable tasks; besides railcarriers, also e.g. the role of the customs as a facilitator is quite institutionalised, having official and legal obligations not allowed for other organisations. The critical question is, to what extent can non-members penetrate to the network or nets, referring to a probability of possible intervention. In the IM network the external constraints as well as the entry barriers hamper the intervention; e.g. VR Cargo is still the only operator on domestic tracks for movement of goods. Moreover, the entry requires remarkable investments, resources and efforts; one option for entry is to *form an alliance with a major player* (see e.g. Castells 1996, 192).

From other operators' point of view the situation is different: without strong concentration on core activities it is unrealisable to implement the economies of scale argument and to reach the critical mass and reduce the average running costs. In Finland the traffic flows and volumes are too small and it is difficult to reach high enough volumes e.g. in container traffic. Some informants claimed that oligopolistic competition, or even a monopoly, with aspects of inertia can be theoretically a good situation because of the scale benefits and an opportunity for a big player to reach the critical break-even.

The focal firm, however, is an important player especially in eastbound traffic, having conventionally rather restrictive activities than more enabling flexible operations. Nevertheless, this role is gradually changing from a passive and restrictive actor to a more active one, but it is hypothesised that the progress will be modest. Personal and other societal processes change the position of single actor (e.g. a firm) continuously, regardless of the strict boundaries between tasks. Naturally, the changes are quite a slow due to the inertia, but actually often dormant in nature. Moreover, the structural components of a bonding mechanism were clearly found: the social structures do not only influence the nature of the relationships but also how they are handled and interpreted.

Consequently, with the help of bonded structures and because of the constraints set up by the members of the network, the role is performed in a rather limited scope. The following illustration describes the magnitude of the expected pattern of behaviour.

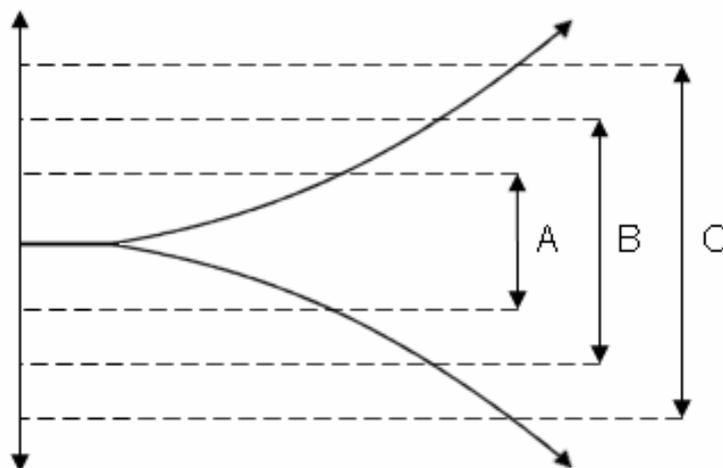


Figure 7.2 Amplitude of Expected Patterns of Behaviour for the Focal Firm

Key: Vertical axis: Extent of Behavioural Responses
Horizontal axis: Time

In the illustration the following areas are represented. Area A describes the area *expected* by the counterparts, because the role embraced by the focal firm is consistent with this kind of behaviour. Moreover, it is *accepted* as well, since it does not disturb the harmony and the settled tasks in the network. In general, the counterparts are willing to perceive this type of behaviour in a positive manner, since it is interpreted to be in accordance with the chosen course of action. Area B is not expected, but it is accepted by the other operators in contrast to area C, which is neither expected nor accepted by the other operators. Thus, the focal firm carries a risk if it is unilaterally willing to enhance the business areas which are not presentations of its own core competency and primary activities.

Most of the members of the network were of the opinion that VR Cargo should restrict its activities to the major ones and *not expand the activities radically to new business areas*. To perform activities in area C would reduce the trust as well, because it could be a sign for the other operators that the focal firm is not truly committed to its vision. Consequently, the question of core competency is not just an internal manifestation defined by the focal firm alone, but also examined by the network members as well. In figure 7.2 the downward and upward sloping curves indicate the intentional destinations, when the focal firm wants to modify its *position* within the network with these new initiatives. In all, the bonds ensure that there are only limited options for the focal firm to change its existing role.

Moreover, the penetration is difficult for the IFT due to the strong bonds and the slight inertia. The roles are partly reinforced because of the limited number of new entrants in railbased IM solutions. Consequently, *weak ties might provide maximum impact, whereas strong ties provide diminishing impact on the network performance* in the long run. The range of formal and informal barriers prevents the penetration of information, knowledge and learning, causing more inertia. Negatively bonded nets have influence on adaptation, as well: the stronger the ties are between the network participants, the lesser the adaptations tend to be.

7.4. Redefining the Role by a New Position

Though having a stable and well-defined role in the network of IM operators, railcarrier might move towards a new position by expanding the range of services or by creating new kinds of relationships with the actors. This is, however, often not possible, since the participants usually protect their business strongly by developing their own business areas; interventions may be regarded as hostile. Furthermore, the position is not an absolute determinant, but rather relative, meaning different things for different actors. This was clearly verified in the discussions with the practitioners, as they did not make any difference between role and position, but rather used the terms *interchangeably*.

Because of the fact that the focal firm has no experience or capability and resources for extending the scope of activities and thus facing new challenges, it is approved both by the railcarrier and the network members that the roles are consistent with the expectations. There were some informal discussions in VR Cargo in the 1990s on whether the company should actively look for new opportunities; this did not change the existing role remarkably.

In general, the term position is often connected with the *market share and size*: in this sense strong position refers to a predominant role in transportation industry. With respect to VR Cargo, the company - in its own words - has a strong position in road services; the service is provided by Pohjolan Liikenne Ab's subsidiaries Transpoint, Combitrans, and Oy Transuotila Ab. Transpoint is actually one of the *three largest carriers of general cargo* and Combitrans is the *largest road haulier of partial and full loads*. Furthermore, Transuotila is Finland's *largest road carrier of liquid fuels* (Annual Report 2000, 22). This implies that a *stronger position is achieved through a higher market share*, which requires aggressive marketing decisions by means of pricing policy, service adjustments, or active R&D, of which the adoption of the Internet-based pricing system Netpoint 2 is a good example. Regarding intermodal transportation, some attempts have been made to evaluate the potential market share for IM freight with an index by comparing the potential volume to the actual one. Though the market share is theoretically important as a variable, it should be discussed deeper because of the fact that position is a complex phenomenon.

The issue of *anticipated position* is interesting especially if the Finnish government is ready to allow free competition on tracks. Then, more aggressive strategic actions are expected, as well as more in-depth negotiations and service agreements with a limited number of counterparts requiring redesigned arrangements. There are a lot of expectations for the future among the operators if the tracks are to be opened for free competition. This implies that the focal firm might consider *more aggressive and*

expansive actions in the freight transportation business. Furthermore, VR Cargo could reduce its *interest for service for all the customers while prioritising some of them*.

A different position can be achieved by *modest modifications for the activities* e.g. by giving loading and discharging facilities and/or services for the counterparts. However, operational matters e.g. lack of appropriate cranes was often mentioned as a problem for increasing the transportation volume, as well as the focal firm's unwillingness to take the care of the activities in modal interfaces. This kind of additional activities can arise some interest among the operators for developing ICT together with the focal firm.

A change, like a new position in a network, requires triggers for the change. In this study some of the *critical events and incidents* were analysed in order to explain how the *role of the focal firm will change when new kind of initiatives are launched*. These incidents could *accelerate the incremental development based on settled* roles. The suggested events are mainly *projects* improving the conditions for more agile intermodalism. Of these projects, RailTrace has been set up by VR Cargo whereas others have been initiated by the other participants.

Indeed, from theoretical point of view, one of the extensions to the traditional ARA-model is an initiative in *an event-based form*. Both in intermodal research strategy (D'Este 1996) and in the school of network thinking (see e.g. Törnroos *et al.* 1995, Halinen 1994, Halinen *et al.* 1999) there is evidence that a critical incident might be a *major source of radical change*. As noted earlier, an event is a critical incident caused by '*man or nature*' (Törnroos *et al.* 1995).

Often the respondents uncovered *critical events others than those attached to formal strategies*. The following microstory (a method proposed by Alajoutsijärvi *et al.* 1998), which is a beginning of an explanation in the interviewing phase, indicates the importance of these events for strategic decision-making; the statement is a response to a question (or more a theme because of the semi-structured questionnaire).

' Why did you decide to invest in the Node of X '

' We (interviewee and a member of the Local Node Authority) were chatting and smoking on one Sunday morning - when he proposed that we could invest further on thisnode;

There it was ! The initial point, the real beginning for this new distribution warehouse'

The strategic decision - though not explained fully was an identified, and recorded, critical interpersonal incident in the process. Furthermore, it indicates the relevance of deep *interpersonal relationships* in decision-making. In this sense, if not in a majority of cases, *actors* are often *individuals in an organic business environment rather than firms*.

The second example on how one event can influence network performance was revealed during the interviews by some of the respondents as a reaction to dissatisfaction. Among the operators in the region, lot of cumulative disappointments and dissatisfaction were identified due to the monopolistic position operator A had in the port operations in the ports of B and C. The progressively ascending container depot charges, which were fixed by A for all the operators equally, caused enormous expenses for the forwarders and to the other operators when an economic recession in Russia

decreased eastbound container traffic through Finland significantly, simultaneously increasing the number of empty containers in both of the ports. The outcome (dissatisfaction) was caused in a long process in which the operators found themselves mistreated by one dominator; this led to disputes and an open conflict, though the charges *per se* were not the main reason. Later this caused some remarkable changes in the network *status quo*: the relationship between two competing ports weakened and an entry from operator D's side to the port of C to facilitate competing container traffic was easily accepted. In this sense the event mentioned was a *catalyst* or an *initiative point* for redesigning radically the strategies, later leading to new kinds of solutions and investments.

Of the *development projects* carrying the characteristics of intermodalism, some of the most interesting ones were selected for the research. Some of these were also participating in the national KETJU program which was launched by the Ministry of Traffic and Communication (MINTC) in 1998 and ended in spring 2000. The KETJU project was initiated by MINTC as a new type of a cluster program in close co-operation with TEKES.

One of the main goals of the KETJU program was to develop general know-how on intermodal transport in Finland – a target which was not truly fulfilled. However, it can be assumed that because of the large number of participants, the question of intermodal transports must have spread widely around the logistics branch. The present author's own findings regarding the true knowledge of intermodal transport correspond with the results of the KETJU: a confusion of terms and lack of successful practices is often prevailing.

Most of the projects supported by KETJU are not connected directly with intermodalism, and just a few have the characteristics of intermodalism. Furthermore, some of the achievements are technical in nature, providing knowledge e.g. in container-handling and lifting technologies. On the other hand, ITC applications give information about the co-operation between intermodal operators. However, on a general level, the aim of KETJU was to increase the understanding by creating opportunities for the participants to construct logistics networks and supply chain models. This was critical, because with the new models the operators can improve the conditions for overall integration, thus increasing also the efficiency of the logistics supply chain.

The main objective of VIPRO (VientiPROsessien kehittämisprojekti/a Project for Improving the Export Delivery Processes) was to evaluate and develop the export delivery process of Finnish paper industry, from the paper mill to an export port abroad. Its aim was to establish a new functional model, i.e. joint working procedures and routines. This was to ensure the cost efficiency and service reliability of the entire supply chain. The information systems that steer and support the activities, were also under investigation. The project covered the principal operational integration of the complete supply chain. Besides the railway company, also loading port operations, sea transports, and discharging port operations were analysed in detail.

From the *railway company's point of view* the ingredients of efficient block train operations were analysed unit identification, train schedules, automatic cargo handling, and more systematic planning and booking amendments. All the working procedures

were documented. With respect to intermodalism, it can be noted that in these types of supply chains intermodalism plays a minor, though important role, because of the fact that there have been many attempts among paper industry to replace the Less-than-Container Load (LCL) practice with Full-Container (FCL) one. However, this requires more investments for loading facilities in the mills; so far a lot of the stuffing takes place in the ports. The major contribution of VIPRO for the main objective of the present research work is to highlight the role of container transportation and the degree of necessary co-operation between the operators involved. Regarding the bonds, the technological one is of main interest because the project partners used the findings in planning their new investments in IT systems.

Technological collaboration can cause positive effects for the development when the operators expose themselves to open information sharing. VR Cargo's attempt to develop electronic-based information system was named RailTrace, which refers to a railway tracking system. The main objective of the RailTrace was to monitor the consignments and wagons on the railway network between European countries and Russia/CIS via Finland/local net. RailTrace is mainly an information system that integrates and disseminates delivery management information. A range of operators can utilise the information both on national level (e.g. VR Cargo, logistic service providers) and on international level (e.g. Russian and European railway companies). Besides, the purpose was to incorporate particular TEDIM (Telematics in Foreign Trade Logistics and Delivery Management) projects to other similar projects. The service is also connected to the operative steering system of VR Cargo (the KULTU system). This ensures that the customers have a safe interface over the internet to RailTrace, and the linkage of new EDI connections is secured.

The contribution of RailTrace is noteworthy for the present research. By giving a platform for technological change, the project necessarily improved the co-operation between the partners in long transport chains. The documented findings include also improved information exchange between partners and the integration of new technology more firmly into railway transport planning and service systems.

By stressing the role of new information technology, RailTrace undoubtedly reinforced not just technological but also *social and organisational bonds between the operators*. Furthermore, it is a critical incident that changed slightly some of the roles in an existing network by giving a more active role for the railway company in a technological progress. It is interesting to contemplate the adjustments that were needed to guarantee the breakthrough of the new concept. However, radical change has not been typical in the IM network.

7.5. Forces of Engagement

The significance of embeddedness as a form of deep engagement and the question of the surrounding reality were identified when the interviewees were allowed to respond on themes suggested by the researcher; both direct answers and explanations describing the state of the relationships indicated that the social structures influence how an actor defines their role and position. Some semi-structured questions were used as well. In this subchapter new proposals are used to make a distinction between two opposite and contradictory forces faced by each actor in the IM network.

The respondents often revealed quite openly but just on a general level their reality by expressing the details of their position with respect to their own surroundings. In general it seems that the actors perceive themselves firstly in a supply chain and secondly in a network, though no uniform thought existed among the practitioners: some of the respondents disliked or hesitated to use the network metaphor; these professionals preferred the use of supply chain ideology instead. On the other hand some were of that opinion that network, not a chain, is a relevant frame for assessing the whole web of operators, transportation and movement of goods.

However, the interview indicated that some of the interviewees hesitated when evaluating the *real* benefits of networked reality. As an implication, it can be argued that there was a slight difference between core actors (deeply involved in operational business) and supportive actors (e.g. port authority) regarding this issue: the core actors emphasised more the managerial chain and the supportive actors addressed the benefits of the networked facilitators. Regardless of the diversified responses to the network theme in general, most of the focal actors were of the opinion, that social nets strongly *influence the decision making* either positively or negatively.

The environment can be theoretically defined as a description of the outer reality (in short: what is outside). Based on the complementary analysis of the empiria and theoretical suggestions the term can be *redefined* by claiming that the environment is '*a need, based on managerial urge and will, to conceptualise the outer space of an actor, that has an impact on the (business) performance, but can not be analysed or controlled exhaustively*'. In this sense the proposal is close to the definition by Collins (1992), who defines the environment as '*external conditions or surroundings which influence (...the) development and behaviour*'. The question of environment was not often mentioned probably partly because of the WUAWUG (economical conditions in Russia as a destination in eastbound traffic were often mentioned, however). Also the initiatives made by the European Union's Commission to favour rail transportation were often regarded as a threat, indicating pressure from the outer surroundings.

Though a detailed description of the process of how a single actor actually captures the idea of embeddedness was beyond the scope of the present study, some components of embeddedness were identified in many situations in the empirical stage of this study, when the interviewees were allowed to respond freely on themes suggested by the researcher. As noted, the social nets have a strong effect on the perceptions, attitudes and preferences of the network engagement. In the theoretical part of the research work, embeddedness was defined as a particular form of deep involvement in the the network, especially regarding the social structures and their impact on interorganisational behaviour. It is now claimed that engagement can be a combination of involvement in a general manner *and the adherence influenced strongly by how the actor is embedded in the network*.

Generally speaking, the involvement in the network takes place through *interlocked nets*; an outstanding notion is that a single (often human) actor can define precisely the nets, whether they be focal, social, or geographical in terms of setting boundaries. However, the IM network in its true extent is beyond these definitions, as many of the influential actors are not well-known or even identified for the members of the focal net. The involvement is required because the actors are affixed to a network, but also to

ensure progress. The progress is converted to new business performance; success is later assessed in terms of quantitative or qualitative measures causing changes in the network or in personal behaviour (as in nets).

Embeddedness as a representation of social structures and their impact can also be a vehicle for discussing not just the *positive or neutral side of the involvement*. Indeed, the second component of engagement can be depicted with *adherence*: it is a *protection against anticipated harmful or deleterious effects of the network involvement*; this protection is needed because of the fact that various episodes and activities - even single acts - cause stress for the relationship (and for the roles as well): e.g. reduced independency and increased dependency, coercive adaptations, less control over own resources, continuous and unsettled interorganisational tension and stress, even hidden aggression as a source for an open conflict. These features might hamper the actors' deep and true presence in the network. Bonds as components of trust, and especially the social one *reduce the tension* and allow handling own business regardless of the longer distance (e.g. more inconvenience) for the other actors. To put it more simply, it can be argued that the environment as a conceptualisation is the *surroundings in relation to an actor*, whereas embeddedness can be interpreted as *an actor in relation to its surroundings* with deep ties especially regarding the impact of social structures. This is evident in the IM network, in which the exit and entry barriers are high, and which is subject to inertia. In figure 7.3 these two different dimensions of the engagement are presented.

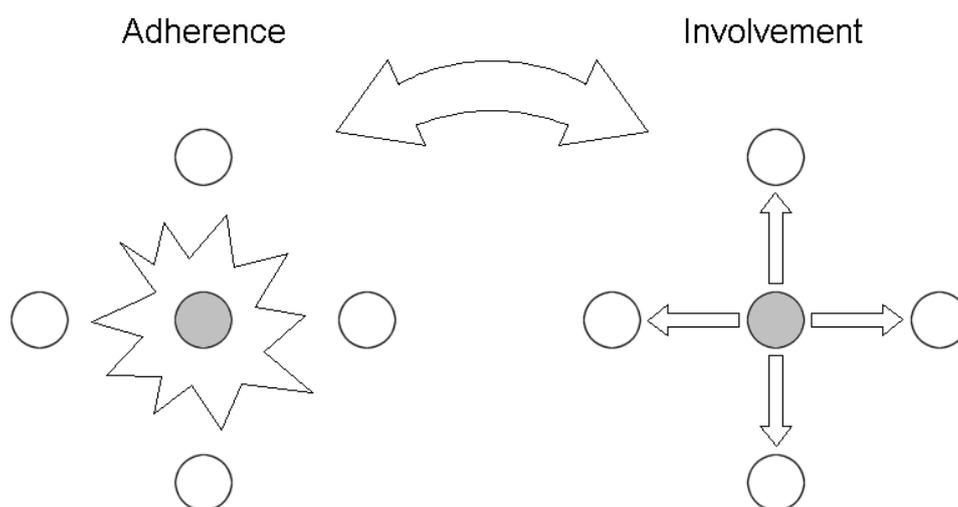


Figure 7.3 Two Underlying Forces Influencing the Engagement

Each actor is obliged to cope with these two underlying forces causing casual instability for the relationship. Despite of this, changes in the roles of IM operators are often minor. Moreover, the line of action for settling disputes and conflicts is intended particularly for handling the negative effects of the network engagement (see subchapter 7.8. for more discussion).

Because embeddedness refers mainly to social structures, it has a direct link to roles. As discussed above, the question of whether the roles as outcomes are mainly due to the structures, or the processes, or, as might be typical, both of these, is still open. Moreover, it is unclear how the effects of the networks in a narrow scope and the network society in a broader scope are transferred to the (business) behaviour with the help of the relationships. The modified and redesigned reality can cause modified behaviour because of the new perceptions and interpretations of the network. Later these new ideas are converted to new type of relationships through the social relationships. An acceptance for the behaviour takes place through the roles and through experimentation. However, the context as a phenomenon limits the generalisability of the results: events occur under specific circumstances in some space and at some point of time.

7.6. Expectations for the Relationships

Based on the tentative model depicted in figure 5.2, (see also figure 3.2), commitment can be described as an outcome of an interaction process in the long run. This includes also all the aspirations for mutual collaboration, expressing mainly positive will as well. The roles include intentions expressing the actors' subjective will, which can be stimuli for the change process. *The outcome*, which is based on this change process, is *a desired state regarding the ideal of the relationship*. In this study the ideal is defined as a standard, an objective, a benchmark, or an expectation *which the present dyadic relationship is compared to* and to what direction the actor is willing to steer the relationship. Moreover, the greater difference there is more between the real and the ideal state, the more there seem to be *tension and suspense* in the relationship causing instability and urge for role design. Hence, the *role expectations are compared to the ideal or desired state of the relationship*.

In order to describe a vision, the should-be of the relationship, the interviewees were asked to give a narrative of the ideal state by using short words, definitions, comments or micro-stories. One informant gave a ready-made list of the most important factors in a well-working relationship. The practitioners often used *metaphorical explanations* during the interviews in order to describe the ideal state or the hidden threats for the relationship like *society*, or *boat and oars* for a network, *collision* to describe the temporal disturbances and malfunctions between a couple of organisations. The state was described as the *balance of horror* portraying the strong dependency the partners exposed themselves to. Marriage was a common depiction for a relationship among the practitioners as well. Inevitably, these suggestions *affect the explanations on the interorganisational roles as well*.

In general, it is important that there is a *common idea of the working practices*, ways of action, and division of tasks. Since much of the behaviour is interpersonal, well-working personal relationships are an obligation. The parties should continuously test the proposed ideas by checking the strength of the reactions and responses; by this, the

partners also test the limits of the party - this is important as the role is strongly anchored to the expectations.

It was also verified that *elimination of the threat regarding the discontinuity* and reducing the probability of opportunistic or antagonistic behaviour is evident; this is an assurance of the consistency of the relationship. In communication, exchange of argumentation is a vital part of the ideal, which refers to the strength of the communication bond; more practically, it is often a question of listening rather than that of stipulation. In general, explicitly and openly manifested and expressed trust through and with the help of interaction, is an assurance of a mutual strive for long term commitment. Considering the network effects, a dyadic commitment should not have harmful effects for the other members in a triad/net/network.

In all, and because of the exchange relationships, both of the parties should benefit and truly need each other; hence an assessment of the potential and concrete benefits is required, as well as a quantification of the real effects. The partners should also have readiness to concentrate on their own core business area, redesigning their own practices because of the counterpart, if necessary, which refers to the importance of adaptation. A dyadic linkage should be a persisting profitable enterprise for both of the parties; there is no need to insist on or bid out-of-pocket prices when acquiring services from the operator.

With respect to aspirations, pioneering, experimentation, and proactive measures have to be an obsession for the parties. A common will to strive for cutting-edge solutions is needed, as well as visible acceptance of developing the relationship with the help of new initiatives. In all, high enough mutual goals and objectives in general are required, indicating congruency.

Regarding the resources, there should be readiness for investments and the new resources should be accepted and subsequently employed by both parties, which indicates the need for indirect control over the resources.

Concerning the real processes and the expectations associated with them, *on operational level* a lot of practical expectations for the focal firm in the IM business were exposed. Mainly *moderate, steady and anticipated pricing policy* especially when raising the freight rates was uncovered: the tariffs should always be subject to comparison of those announced by the rivals; operators do not accept unilateral stipulation. Higher speed in performing the service was perceived vital, as well as later discharging facilities and earlier loading in the destination. From the focal firm's point of view the model consisting of late departure and early arrival is quite difficult to pursue though tenable schedules are established. *The focal problems to cope appropriately with these problems caused stress for the relationships as well.*

As regards *the triadic relationships* and the need to develop them, some triadic partnering arrangements were found in this study e.g. railcarrier – sea carrier – railcarrier, and seacarrier/charterer – small steamship companies – dockyards. Inevitably, in the IM business *the intervention or integration from the TPL's side creates a great number of triadic relationships*. Moreover, most of these triads were rather unilateral than serial ones. Because of their strategic nature, it was clearly announced that no exact information can be revealed to the researcher (compare to

figure 6.2). Moreover, these arrangements did not represent true railbased intermodalism, and were consequently not in the analysis.

It seems that triadic relationships are *rather complex*; there was some evidence of increased interorganisational tension because of the deeper dyadic relationships especially if the two parties were competing of the same service. A dyadic collaboration was harmful, even deleterious for the others. Therefore, there are *hostile triads* because of the close and bonded pairwise exchange relationships, and *neutral* ones, which mean e.g. integrative activities from the TPL's side. The serial and vertical triads with interorganisational complementarities are more neutral than the unitary ones: the focal firm is not a mediating partner for the others. Focal firm has plenty of specific and unique tasks based on its commitment to maintain its role.

Because of the fact that the triadic situations are even more sensitive, subtle, and non-professed in contrast to the dyadic ones, the researcher made a decision *not to expose the details of these linkages* or to uncover the main logic of them. This was done to protect anonymity of respondents and their open reactions for the themes under consideration. The number of core actors is limited and the strong cognitive bonds mean that the members are capable of identifying the relationships if exact details are revealed.

7.7. What Prevents the Development of a Deeper Relationship?

Because of the type of network under consideration and the impact of the bonding mechanism, it is evident that strong relationships are often created. The transactional view with concurrent short-term episodes, however, is not obsolete: with some counterparts this could be even an optimal state of affairs, since it is not reasonable to establish and maintain deep relations with all the members. In general, the *operational aspects* of the business were strongly underlined during the discussions, having impact on the relationship as well as reducing or increasing the trust: unwillingness from the focal firm's side to improve the conditions for better IM business can be interpreted as a sign for having neither capabilities nor interest to continue the business. Inevitably, the roles are strong, but they also ensure the continuity of the co-operation in the IM networks. Besides, role behaviour is an indicator of trust. In this study, the cognitive distance measure, and its ingredients, enabled the researcher to clarify the question of obstacles and hindrances for deeper collaboration. The higher the frequency of interorganisational interaction and contacts, the shorter the interorganisational distance tend to be (compare to table 4.2).

Some of the informants were of the opinion, that there are *too strong role expectations for the focal firm*. Besides, it was found out that there might not always be unwillingness to modify the behaviour on the focal firm's side, especially regarding the *freight rate policy*: making adjustments could be important in this particular practice. *The lack of appropriate information regarding the cost structure* and its impact on freights was often perceived problematic; though increased to some extent, enough information is still not revealed. Furthermore, there might not be enough interest to improve the conditions for new enterprises regarding the development of the current pricing mechanism.

With respect to *information sharing* it was suggested by several practitioners that one of the *prerequisites for deeper co-operation is transparency*. If this is true there is need for more visible processes among all the actors involved in the local net, e.g. by implementing the open book- principle. This implies that the activity/resource interdependence should be accepted before synergetic actions are planned and implemented. Besides, open and identified core processes are needed to ensure the development of relationships. Furthermore, control does not necessarily mean equity-based governance. A single actor's determination while performing the settled tasks - whether these indicate core competency or not - is an expression of the will to maintain the existing role. Other types of behavioural signs, e.g. the actor's willingness to enhance business behaviour in an arrogant or aggressive way, could be interpreted as an overreaction by the other actors, having harmful effects in the long run. With respect to openness, a prudential tendency was identified: '*Certainly it is possible that in closer and more open co-operation like partnering they will win more and we less if any*'.

In more visible processes a single actor (an *interdependent* firm like the focal one) will (or should) concentrate on those *core activities* (the main processes indicating *core competence*) in which the relative competition advantage is at highest considering the fact that there still exist rather strict boundaries between the firms. The processes should be visible for *all the parties in the network, with whom one actor has a direct and reliable linkage*. By doing this a firm can achieve the best results in terms of profitability or other performance measure; if an actor is dependent due to unilateral governance, the core competence should be integrated to the main processes of this main dominator. Nevertheless, the *question of more open information sharing is still problematic for many of the operators, preventing the development for deeper co-operation*: VR Cargo as a counterpart *seems to hesitate to disclose relevant information due to strategical reasons*. Practically, however, it seems that the information sharing is more or less asymmetric in the IM network.

Some members of the intermodal network tend to be very prudent when contemplating whether VR Cargo will actually be *totally committed to its role as a neutral service provider* also in the near future if tracks are opened for free competition. In the future too strong ties with the focal firm might limit the scope of opportunities with other operators. This is a risk especially if VR Cargo - when configuring and updating strategies - selfishly and unilaterally changes the course of action. Confidence requires publicity and openness, which - though widely conducted - is a bit problematic. Organisational redesign was also under consideration: some of the respondents mentioned, whether or not combined transport will be both an integral business of the general cargo transportation, and truly an independent strategical business unit.

In all, *concrete and impressive breakthroughs are needed* to find better practices both in minor and major matters. Process improvements in the minor affairs could be regarded very positively, when the counterpart monitors focal firm's willingness to improve the conditions in the mutual enterprise.

7.8. Conflict Resolution

It seems that a robust relation/s requires sophisticated methods to reduce the threat of failures as well. In this sense, the mechanisms for handling the difficulties and the procedure for conflict resolution are of major importance for the on-going collaboration. One of the major expectations for the conformity of the behaviour is the anticipated means for working together also under problematic circumstances.

In a tightly structured network, the participants try to *avoid conflict* by searching for a resolution which often takes place intuitively and subconsciously, but also rationally and intentionally. This is an obligation, since expressions of strong arrogance increase tension, and could lead to an open conflict. The partners trace look unanimity or full consensus by bypassing and mediation. This is especially true with the interpersonal relationships. Besides, the role occupied by the actor coerces them to behave in some particular manner also when handling cumbersome matters.

The process for resolution is fundamental, as the progress in general is mainly based on agreement, what is the direction in mutual collaboration. Some of the participants have e.g. discussed of the use of shuttle and block train operations, and even a charter system has been under consideration with the focal firm in drayage; that is the inland haulage of containers, which is either a pre-carriage phase in exportation or a main-carriage one in importation. Though never fulfilled with any of the operators, the informal discussions and debates – chats in different groups and social nets – have led a situation, in which the parties can test the relevance of the exposed ideas. This is a legitimization to draw a conclusion which later has impact on the state of the affairs. These negotiations, which take place in different locations, allow the operators to discuss future concerns together. Moreover, this type of mutual collaboration contributes the trust-making procedure and the coexistence by gradually increasing the trust. It was claimed by multitude of actors, that *trust requires acts*, and episodes and hence also *reactions*.

When the persons as individual actors expose themselves to free discussions, a concrete activity is aroused. Besides, these patterns also reduce the risk of misunderstanding and uncertainty because the partners face the potential confrontations and collisions together. The process hampers and partly eliminates confusion and reduces the fear of failure. The open initiatives and informal inquiries can be regarded as positive signs which increase the participant's willingness to approach each other.

In all, most of the participants tend to accept temporary tension but they try to avoid an open conflict. They settle the problems with joint efforts before real disputes arise. Furthermore, the expected pattern of behaviour - and the argumentation and reasoning included - is *reinforced by appropriate communication*. The communication *per se* is often a face-to-face dialogue in frequent meetings. The rhetoric is an assurance of a trustworthy behaviour.

Regarding disharmony and even opportunistical behaviour, it can be claimed, that there is no relationship without problems. Occasionally, however, the participants protect their rights for a certain activity by overreacting to proposals made by a partner. However, defensive actions are needed only if oppressive and adversarial acts are

anticipated. This pattern of behaviour is not required if one counterpart is convinced that the other counterpart is committed to open discussions.

Furthermore, the *high tolerance for criticism* indicates that a party is conducting the activities with determination; certainly modest adjustments are again needed. In all, there seem to be quite a *low degree of formalism in the resolution instead of interpreting e.g. the legal bonds strictly*.

The discussion above advocates the strength of informal collaboration within social nets. This is a necessity because of the mutual urge for consistency. As noted, in this kind of behaviour - and an outcome of the process - the net members are looking for harmony. Argyris (1999) claims that in interpersonal relations, the imbalance, or incongruency is often very abhorrent. Using the ideas of cognitive balance theories, he postulates that '*cognitive balance or consistency enable the individuals to predict accurately and thus behave more effectively in their interactions with others (...)* Also, '*it is assumed that there is a basic tendency for individuals to strive to reduce imbalanced states as cognitive dissonance and inconsistency.*' (ibid., 386). Although interesting, the social-psychological theories are beyond the scope of this thesis, and thus not exhaustively analysed. Moreover, changing the roles drastically - and attaining a new position - could be even harmful. Expanding business and changing roles, as well as new positions decrease substantially the others' opportunities in their attempts to give new kinds of solutions for the others.

7.9. Operational Inhibitors of IFT: Barriers to Overcome

As noted above, many of the problems of the more efficient intermodal practices stem from the involvement in a relationship based on different expectations, lack of full trust or asymmetry in terms of power or behavioural responses. The respondents also perceived many other factors - more or less neutral in nature - which can be regarded as obstacles and pitfalls for improved performance in intermodal business. These problems are often not evident because of the inappropriate dyadic relationships, but they are often reflections of the network limitations. The role of the other facilitators, which indirectly influence the practices, should be noted, too. Next, some of the responses are analysed using the classification of an *actor and resource and activity-based hindrances; transit and eastbound* as well as *westbound and domestic drayage* are discussed separately. In these chapters *the real processes of IFT* are more accentuated than the interorganisational processes of exchange, remembering, however, the interplay between these two different types of processes (see figure 1.2. for details).

7.9.1. Transit and Eastbound Traffic

Considering the local net - South-East Finland - the intermodal solutions are created predominantly for eastbound and transit traffic. *Transit* as a generic term means transportation of goods through a *third country* intended neither for import nor export in that country. From the customs' point of view the transit of goods means that there will be no customs declaration or customs clearance for goods, though legally the goods are still under customs supervision. Practically the goods are submitted to a transit procedure, if they are transported outside the territory of the EU. For products

manufactured in the EU, the submission for export procedure is handled in the country of departure; this requires a use of a SAD (Single Administrative Document for customs clearance) document; in intra-EU trade the use of SAD is not required.

In this sense, the role of the area (or a territory) has been defined in a quite *passive way*: the transportation with different transportation modes including supplementary activities at nodes and to name discharging, loading and terminal handling. With value added functions located in the transit region the local operators try to find a *more active role* for a specific territory together with a railcarrier. There many of the local operators are of the opinion, that VR Cargo should *have a more active role in the development*. In all, the transit route as a constellation of operators could be a more active part in the facility network, referred to as value added network, supply network or even *value net*.

Activity-based Inhibitors

Many of the major problems arise from the supportive or facilitative actors' reactions on the Russian side. There are *unnecessary delays* due to train inspections on the Russian side because several different controlling actions are needed by various administrative bodies; the total declaration time varies from 12 to 15 hours. This increases significantly the time distance in rail-based IM-chains, when Russia is the destination. This question, which has been further discussed in RATKE joint-committee between the Russian and Finnish Custom Authorities, can not be solved by the focal net alone, though it can be affected by Finnish operators indirectly. Furthermore it indicates the importance of the reliable mutual co-operation there should be between the supportive actors. Besides, the total number of returned wagons is approximately 10 % due to *strict interpretation of regulations* (e.g. the commodity code is missing in an invoice; a commercial invoice is not attached). Again, this is an external attribute, which is hard to solve without tight inter-organisational, even inter-governmental actions.

It seems that the *contradictions and disputes between two Russian operators* are of significant importance and have an impact on the container freight; the Russian customs authority, which is well-working, and the October Railways have interorganisational stress for reasons of prestige.

Practically, there is *more flexible customs clearance* in road transportation, which means that the level of honesty is higher in rail transportation, which is an obstacle for developing the railfreight. In road-based transportation several informal and even illegal but legitimate practical actions are utilised: e.g. double-invoicing, fraudulent TIR Carnets, duplicate documents, which are not acceptable from the legal point of view. Inevitably, more flexible customs clearance on the Russian side favours the use of the domestic fleet and flag. This situation is extremely hard to change because many of the practices and patterns are culturally bound, though indirect influences and interventions from the authorities' side are possible.

In general, the total volume that is needed to ensure continuous and well-working performance in the rail-based chain is below the profitable break-even. This requires stronger *commitment* for increasing the volume and reducing the imbalance from both the focal firm as a service provider and the customer (forwarders). Undoubtedly, these

attempts would probably influence the freight rates as well, which are higher than in road transportation due to the dominance of the Russian fleet. However, the freights charged by VR Cargo are not the major obstacle for increasing the volumes.

However, balancing the block train operations is difficult due to the structure of the foreign trade between Finland and Russia; it is not an easy task for the focal firm or for the forwarders to find return loads either for the semi-trailers or the containers. The problem of imbalance may be anticipated also in the long run, though in general the *dilemma of the dominant leg versus light leg is evident*, correcting the unequal dispersion of traffic. Planning with the help of higher volumes can reduce the risk partly but not eliminate it totally.

Consequently, the balance problem is subject to external market volatilities on the Russian side. During the 1990's eastbound container traffic through Finnish ports increased significantly in both of the regional sea ports, which are the main hubs in the region. The bust in 1998 is explained with the devaluation of the rouble in August, which was a consequence of remarkable economic problems in Russia. The increased consumption before the stagnation in August 1998 and the parallel decrease in import was funded - directly or indirectly - with the credits issued by IMF, EBRD or similar foreign lender. Nevertheless, right now the prospects for increasing exportation on Russian markets are promising. On the other hand, because of the low value the Russian rouble has, the substitution might lead to a situation in which the exporting of other than consumer goods might increase at least in the medium run. In medium run it has been assumed that the growth rate for movement of unitised goods through Finland will be high.

Resource-based Inhibitors

One of the major obstacles for increasing the traffic are the discharging and loading conditions in Moscow, in a similar manner as in St.Petersburg, which are poor and not adequate for well-working intermodalism. Also, the appearance of several, often competing operators and severe interventions from the authority side (e.g. licences required) cause remarkable disfunction for the traffic. This means that external investments are needed despite of the high economical and political risks they have in the Russian economy, and the unpredicted, and even chaotic cyclical fluctuations. The boost in August 1998 apparently disturbed the development of rail-based solutions for a while. Rail-based intermodalism (e.g. haulage of containers) requires a tightly scheduled and appropriately balanced two-way traffic based on rather stable and predicted demand in order to reach acceptable efficiency.

Actor-based Inhibitors

In the long-run, the hard rivalry between the networks *en route* Continent /U.K –Russia and vice versa especially in eastbound traffic forces the focal actor to face the threat and utilise new initiatives. Though the service that is provided by the domestic facilitators is perceived to be of high quality by the shippers/decision makers, there are lots of risks in the investments because of the several joint ventures and joint efforts they have in many of the seaports in the Baltic States. In near future it is also expected that the now most

commonly utilised DDU– type of delivery terms will be replaced with F- or C- terms (destination port of entry in Finland or terminal). In combined traffic, the Russian counterpart takes care of the delivery from a warehouse located in Finland to Russia already now. This indicates that the *Russian traders consciously want to increase their involvement* and strengthen their role as principals in the decision making, though they are not in the core of the network. This might imply that the *position of a railway company may be significantly weaker compared to road transportation*. This requires more and intensive contacts with the Russian counterpart on multiple administrative levels, as well as intensive benchmarking.

With respect to *roles in the network*, there is not any *one single big operator* (e.g. mega-carrier, forwarder, one shipper, even consignee) which could lease, hire or charter the block-train service, thus providing the railway company with a promise of stable demand for a certain type of service. In brief, there is supply if there is enough adequate demand for a service. Nevertheless, new initiatives are needed to trigger out some new traffic.

7.9.2. Domestic and Westbound Drayage

In domestic freight, many of the problems arise from the *infrastructural network design and of the limitations inherently associated with it*. Despite of the increased volume in the major legs (Turku, Helsinki, Tampere destination North and vice versa), it is not profitable to increase traffic to and from off-line stations and terminals outside the major linehaul drayage. Besides there is a limited capacity on the focal firm's side to provide service for a small number of wagons, or groups of wagons. Moreover, a limited infrastructural network in some parts of Finland, including the problem of a single-track line causes delays in freight transportation. Because the passenger traffic is prioritised in the schedule making process, the timetables for freight transportation are not the most appropriate ones. In practice some extra time for the loading of semitrailers is often needed (e.g. one or two hours) prior to the shipments. The limitations in the infrastructural network is a main attribute for discussing the spatial considerations as well.

Because of the limitations in the concrete railway network, the *slowness of the rail-based service is an obstacle for reducing the total in-transit time*. On the other hand longer loading and discharging times – the laytime for the customer – is a positive feature in the railway service, though the demurrage can be problematic, causing both expenses and disagreement between the parties. One reason causing delays is that the synchronisation of functions (e.g. taking and leaving of wagons) in terminals, depots, and marshalling yards is difficult with single railway cars or groups of cars. On the other hand, the use of block trains or even shuttle systems requires a high level of stable volume with special equipment in order to achieve conditions for tightly scheduled operations with enough time-slots for the traction of cargo. Several respondents argued that in domestic transportation the time distance in railbased solutions is too high. This can be critical for the development, as the focal actor provides the service with terminal-terminal- conditions in contrast to road transportation, in which door-to-door-deliveries are more common, reducing the total transit time.

However, the too long time distance is a problem in general. In a study conducted by the Ministry of Transport and Communication in Finland (MINTC,1998), several intermodal routes with cases were analysed *en route* Finland-the Continent. The time distance (referred to as transportation time) was generally estimated with three different components namely transportation time, average speed, and accuracy of deliveries (Estimated Time of Arrival, ETA, as the variable). The cost distance was evaluated by means of total price. As a conclusion, in rail-sea combinations the average speed was between 8,1-11,0 km/h - higher than generally characterised (5 km/h). The main reason for the slow average speeds with rail/sea combinations were the long holding costs due to daily cycles in railroad performance and respective schedules (MINTC 1998, 75). Consequently, the *need for reducing Non-Value-Added-Time (NVAT) is one of the major targets for the joint activities*, if the focal actor is willing to expand rail-based intermodal freight.

Furthermore, the problem of how time the distance is associated with the cost distance is worth analysing, requiring an analysis of the relevance of cost distance in the shippers' decision making. In general, many studies regarding the most adequate mode selection criteria in a shipper's decision making process show that reliability is seen as the most important one in IFT. The content and the interpretation of the term reliability differ survey by survey; the term is close to reliability with synonyms like total quality, service level, or dependability. Accordingly, time distance or cost distance are ranked as variable quality. If so, it could be expected that the reliability of transportation service is the critical criterion in a decision making process, when an operator acquires service from the focal firm.

However, many of the shippers typically insist that the carrier has to provide certain level of performance in terms of quality. The quality factor is more or less dualistic: if the service provider can offer high enough service it is acceptable from the shipper's point of view. If the estimated service level is below the acceptable level, the shipper will disqualify the provider (e.g. carrier). This means that in the beginning the shipper will pre-test the service level of the service provider using some method (e.g. former experience, references, intuition, and report from external audits) and then either accept or discard the partner. After this both the cost and time distance will be evaluated. Moreover, the final decision - at least on operational level - will be made on the basis of the use of these two critical measures.

In IFT, there is some evidence of the above, e.g. in the SCANDINET investigation Ludvigsen (1998, 13) proposed the following three-stage model depicting shippers' buying behaviour in the intermodal context:

- the shipper evaluates the *quality of transport* first,
- the shipper choose the suppliers of intermodal transportation who *can secure the needed quality level* next, and finally,
- the shipper negotiates the *lowest freight rates* (implying the lowest cost distance) for the level of desired quality before placing orders with the final suppliers.

Considering this study, quality is also a prerequisite for the transportation service. Furthermore, the shippers as well as the other operators in the IM network do value and even insist on the use of lowest freight rates. On the other hand, the cognitive distance is of increasing interest; e.g. Stevecos (port operator) strategic objective is to be a

leading port operator in Europe reduces the cognitive and attitudinal distance in decision-makers preferences *en route* Continent-Finland-Russia and vice versa.

However, the transportation time is only part of the *total lead time* for the flow of goods through a chain. A lot of effort is needed to minimise the total elapsed time in general; there is need to find out appropriate trade-offs between production systems, inventory, and transportation in order to accomplish the time compression. Generally speaking, IM transportation has a lot of obstacles for higher productivity. Unnecessary transfers, practices in IM interfaces, slow loading and discharging methods in terminals, or stripping and stuffing the containers inefficiently are examples that often occur. The optimisation of functions between two different transportation modes can be problematic: as stated above the suboptimisation often occurs due to systems in which the interface events have not been synchronised, or because of problems with interoperability. Furthermore, when the focal firm is carrying out the *role of the subcontractor*, they do not have any direct contact with the end-user/customer and do not have *adequate information of their policies to reduce the total lead time*.

Resource-based Inhibitors

As regards resources, the major limitations are lack of efficient terminals in many stations, and the inadequate facilities for transferring the ITUs in transshipment nodes. There are only a few gantry and portal cranes maintained by VR Cargo available for the hoisting and transferring; this is of great importance in distribution and pickup activities for containers; extra hoisting with poor equipment is expensive and time-consuming. Also, the expensive FCL practice, including the required dunnage reduces the interest to enhance the container operations. There is a common tendency for expansion in real FCL practice, which requires the stuffing and dunnage of the containers in the shipper's premises; though expensive, this kind of practice can partly replace traditional full-wagon loads.

Actor and Activity-based Inhibitors

One of the pitfalls is the too conservative policy for freight rates with no prior notice or option for open discussion. Some of the operators claimed that it is not always clear, what the valid arguments for raising the tariffs are, which means that more appropriate and detailed information is required. Regarding the role, the respondents claimed that often the master's voice is missing; there seems to be unclear division of responsibilities.

In general, punctuality and prompt deliveries are of paramount importance for reliability; delays are often regarded as total malfunction reducing the trust on railbased operations. Slight delays, however, are accepted e.g. due to adverse weather if the customers are well-informed prior to their own attempts of handling the problem. Lack of appropriate marketing activities and not enough aggressive selling in general, especially in international traffic was perceived problematic as well.

7.10. Contribution of Network Views for Management

The SCM-based description of real processes of movement of consignments through the chain, and the network view with its virtual processes for change and adaptation are distinctive, but converging theories. The SCM with its theoretical underpinnings relies on the idea of the SR– model, though in practice the IM industry with its huge number of actors and infinite number of relationships is an entity of diverse interactive situations. One leading company, e.g. the integrator, can not be dominant, though the forwarding industry will enhance their efforts to deploy marketing activities in transportation industry.

Furthermore, the studies of interorganisational networks highlight *sets of (business) relationships* rather than *sets of connected firms* in the context that is considered here. The work of Scandinavian scholars is valuable for IM research because it gives a *conceptualised descriptive tool for analysing relationships in any kind of business environment* by naming and defining the primary components, depicting the most appropriate correlations, and addressing the relationships. The fundamentals as explained by network scholars are also valuable for logistics and transportation science, as the intermodal transportation industry is a set of different operators, facilitators, and activities; the compilation is mainly analysed *on firm level, not on actor level* (compare to the structure of the tentative model in Figure 5.3.). As to processes, there are real processes of moving unitised goods by rail and by other modes, and the virtual ones, which are mostly intangible, based on and reinforced by personal interaction.

The above implies that a common, generic domain, like network thinking, is required to avoid some of the difficulties arising by investigating the phenomenon of the intermodal industry with conventional managerial models only. Besides, often the most critical question is not the functions performed by the operators but rather the roles played by the actors.

A single service provider for intermodalism *can not make the decisions truly independently*. Many of the decisions and actions a single actor has made are actually responses for the actions implemented by a range of actors in the nets and or/network. The embeddedness, as well as the position influence a single actor's behaviour. This item is crucial in the network theory and clearly differs from more typical managerial theories and explanations, where an independent decision maker is highly emphasised. The decisions are affected by the business environment, which can be defined as a faceless entity of powers influencing the decision making. *A network* is not a new theme in logistics. However, the traditional infrastructural network analysis with simple node-link architecture is not always applicable: the nodes are places or locations with numerous operators creating a *micronet* rather than single points or nodes for loading, discharging, or terminal handling.

Besides the network as conceptualisation, the *power of nets* can be substantial also from the practical point of view. By covering some major destinations in eastbound container traffic, this study can have some practical implications through introducing the nets; e.g. the route Continent/U.K.-Finland-Russia is under hard competition with several possible combinations of terminals, ports, and modes (see e.g. Salanne and Saarto 1998, Kajander and Tervo 1999 for more discussion). The attraction of the Finnish transit route is assumed to be higher if the partners have willingness to co-operate more

intensively. A higher attraction will probably mean shorter perceived distance in the decision-makers preferences. The decision-makers are mainly foreign shippers, consignees, or intermediaries representing them. The position of the Finnish transit route could be significantly better compared to other transit routes in the Baltic Sea region. Consequently, *the route through Finland is as good as the total performance of the nets (regional, social, technological)* and the national and/or regional IM network (compare to suggestions by regional associations for more efficient clusters such as the Kymenlaakso region, see Nikkanen 1998). Moreover, *the social nets enable the members of the chain to achieve the targeted objectives*. In this sense, without real and well-working nets the operators will fail to improve the customer service and thus the value for the customers.

Considering the focal net, it seems that the actors involved can be a part of the *local nets as well* because of an *urge for decentralised decision making*. Many of the operational decisions are actually made on the local level, and thus the tactical level interaction ensures the success and reliability of the transportation. This means that the local net of IM operators consists of the focal net, other operators and supportive actors. A functionally based focal net refers to interdependent *activities* among actors, although the resources are predominantly heterogeneous and complementary. As to the extent of operators, the defined local net is close to the cluster/logistics port- theme as discussed by regional associations, though not fully identical. The public sector, as some of the stakeholders are defined, will probably have an important role as a network facilitator; meanwhile there will be a trend for increased deregulation on the transportation markets in general.

The mission for the Kymenlaakso region, which is part of the South-East region/local net, points out that more co-operative and bonding arrangements are needed to ensure the competitive advantage of the Finnish Route; in this sense the net explained as a cluster is predominantly a tool for improving the strategic position - the macroposition - of a net related to other nets in the Baltic Sea region. This implies that *nets*, not operators alone, are struggling in a hard rivalry. This strategic implication might benefit both the local operators and the stakeholders (e.g. port authority, regional associations, communities and municipalities). In this sense this study may include some practical benefits and guidance as well.

The missions manifested by the local organisations in Finland to improve the conditions for value added logistics (VAL) operations have been discussed by theorists as well (e.g. Frybourg and Nijkamp 1998). In all, there is a trend towards logistics ports: *this means that those regions which offer favourable opportunities for logistics services may become dominant actors in the form of logistics mainports* (sea ports, dry ports). The tasks required to fulfil the objectives demand sophisticated telecommunications services, interoperability and several supportive actions as well as incentives from the supportive actors' side. In this sense the focal firm alone can not trigger out new kinds of solutions because of the resources needed for improvements in intermodal freight transportation. However, the focal firm can be a catalyst for these new initiatives by more determined activities in the IM network. *The value is loaded to the diverse relationships the members have in the IM network*.

It seems that *the actors load the relationship intuitively with the idea of value*. Many of the counterparts of the focal firm appreciate *the focal firm even without any reciprocal*

business operations; the relationship is alive without an economical bond because the cognitive and social bonds are an assurance for the continuity of the relationship. Furthermore, the respondents made some proposals for the value-added activities. Though widely discussed and exhaustively planned e.g. by regional associations, it was extremely difficult to find any real examples of adequate VAL solutions in the major region that was under consideration. In a non-bulk business – like multimodal solutions - most of the examples are simple forms of postponed manufacturing like re-packaging, putting instructions to packages and labelling. It seems that simple VAL/postponement thinking still rules the regional debate, including its logic for value creation. This is a weakness, as *bonded nets* with appropriate adaptations *enable value added functions* through intensive and strong relationships in an organic and flexible business environment.

The method applied in this study, including the idea of intersubjective dialogue and the proposed implications can be important, as they allow the facilitators to understand some of the fundamentals of network behaviour, e.g. the *basic nature of network creation and maintenance logic*. Thus it is possible to convert some of the results into strategical tools when better competitive advantage is looked for: with the nets and the network and within them.

8. Conclusions

8.1. Summary and Discussion

In this study intermodalism as a form of interorganisational behaviour was scrutinised. The major objective of this study was to analyse and describe the engagement of a railcarrier through its roles and position in a railbased intermodal network. VR Cargo as a strategic business unit of the Finnish railway company VR Ltd was chosen to be the focal firm. The most important accounts perceived by the focal firm were the members in the focal net.

Although intermodalism (IM) or Intermodal Freight Transportation (IFT) have been recently intensively analysed by many scholars, there are still many areas to investigate. Conventionally, intermodalism has been defined as movement of unitised goods with at least two different transportation modes in a chain of operators; often the use of Intermodal Transportation Units (ITU) is an obligation. However, the technical orientation in the studies requires different approaches in order to get new mindsets both for the practices and for the theoretical discussion. This means that intermodalism is not a question of a chain connected by the operators, but rather of how IFT is generated through the actors' engagement in the network. The network as a set of relationships rather than a set of hubs, nodes, links and actors is tied up with different actor bonds. As such, it is not important what the tasks and functions performed are, but it is rather a question of captured roles and positions. In the beginning of this study a distinction was made between real processes (physical and concrete by nature, based on business purposes) of moving unitised goods (of intermodal freight transportation), and virtual processes, which often, but not always, take place in social interaction (organisational exchange, adaptation, and co-ordination). For this reason, interorganisational processes and their outcomes (commitment, actors bonds) were scrutinised. It should be taken into account that it is a challenging task to discuss two such different network views despite of the possible convergence.

In order to clarify the metatheoretical differences between the different grand theories of modern logistics research, both strategic and behavioural paradigms were suggested. The behavioural paradigm means that the logistics research is enriched by the proposals, concepts and ideas created in social sciences, and more particularly in the social exchange theory. This implies that themes and concepts like role, position, power, embeddedness, identity and interaction should be examined. These proposals are often transferred through the modern marketing theory. In general, the contribution of the marketing theory can be noteworthy, as there is a strong interest for analysing networks in it. In the strategic paradigm the examination relies more on classical modelling (hypothetic-deductive approach in analysis and mechanistic SR- scheme) attached by an urge to trace practical strategic benefits. The behavioural paradigm is an umbrella for the network view/s in a similar way as the strategic paradigm has features of the managerial, as explained in the present study. Besides conceptualisation, the recent logistics paradigms were discussed in order to uncover the needs for intermodal research. Logistic researchers have recently been interested in questions of networks, underlining the societal processes and considering more carefully the contribution of social exchange theory as co-subject. The reality is more fragmented, and the actors

expose themselves to resource dependency. Besides, networks are more like nets; smaller units of network structures composed of social, technological, or local relationships. Furthermore, typical for the postmodern era is the prevalence of coherent pluralism, which means that the actors are facing a reality in which everything is intertextual, and thus not causal or predictive.

In the first part of the study, the major challenge was to present different explanations by contrasting two different approaches in modern logistics – the IMP-based (Industrial Marketing and Purchasing Group) network view and Supply Chain Management (SCM)- thinking, especially considering intermodalism. It was assumed that SCM is a representative of managerial, or strategical view, thus influencing the explanations as well, because it carries particular theoretical underpinnings. Furthermore, the IMP-based view (or approach) strongly emphasises that networks are sets of relationships rather than sets of firms (actors), as assumed in conventional SCM thinking. The industrial network view is close to the behavioural paradigm in a similar way as the strategic paradigm has parallel features with the managerial view. The network has strong geographical aspects as well, e.g. location, impedance, distance, and even friction. Moreover, the embeddedness theme requires an analysis of spatiality as well. Therefore, it was decided that in the theoretical part of the study, spatial aspects should be considered. With respect to other theoretical explanations, the Transaction Cost Approach (TCA) was briefly examined as well, because it provides a theoretical background especially for the managerial view; the major interest in TCA is to describe the governance structures and to define the best type of relationship a firm should develop in the marketplace.

In chapter two, a distinction between different ways of conceptualising intermodalism was made. It seems that researchers tend to extend the definitions by conceiving functionally based layers, or addressing the need to integrate several functions. In this study, multimodal transport has various theoretical parallels with intermodalism, though transportation in general is not handled in such an integrative and strategically planned way. Combined transport denotes to a situation in which a rail/road combination is used.

In the theoretical analysis the aim was to shed light on the contextual matters, as one of the implications of the behavioural paradigm is that the phenomena under consideration are more or less context-bound. It should be accepted that the result is a combination of factors, actors, and reactors in some space-time constellation, which limits the generalisability of the results. Because of the fact that network is a metaphor, the idea of metaphorical thinking was analysed in order to find justification for some proposals. As regards the concepts of the outer surroundings, it can be claimed that IFT is not just a question of how production systems create intermodalism, nor a question of how networks produce it. The notion of how an IM network is created through the roles and positions operators might have is an important point in this study. The roles/positions represent the behavioural aspects of the interorganisational cooperation in contrast to the kind of analysis, where the physical processes and functions of transportation are mainly in focus. This implies also that the concepts embeddedness and context can be valuable.

The cornerstone of the IMP- network view, the ARA- model (actors, resources, activities) and its components give a solid basis for studying the logic of networks. The actors, which can be firms or organisations, are often also individual decision- makers. In general, the network view relies on interaction in general: a multitude of mutual responses exist, when the actors are collaborating more deeply. In this sense, the dominance of the SR- scheme is rejected due to its strict compliance, when theoretising the actors with proactive measures and the reactors as reactive measures. Practically, there are a lot of challenges for the empirical work, as interorganisational behaviour is a very difficult area of investigation. In general, one of the most important objectives was also to reveal those conceptualisations that are not explicitly explained in the SCM-based approach, and which are needed to understand the logic of the network view that is applied in this thesis (e.g. identification of nets, inertia and stability vs. dynamics and events as triggers of change, bonded structures, major interorganisational processes and their outcome). In a deep exchange relationship the actors create and maintain a multitude of different bonds, which later leads to structural bonding. The roles are based and strongly reinforced by the bonds, especially if and when stable networks with strong inertia are to be analysed. The IM network structure consists of various nets with blurred boundaries; besides a focal net also local and triadic nets were discussed in this study.

The interorganisational role can be defined as a task or duty generated through relationships and because an actor is engaged in the IM network. It is also an expected pattern of behaviour. Moreover, the role is anchored to network dynamics, which means that social structures have some influence, especially in the social nets. From the theoretical point of view actors, reactors and interactors can be presented. There are several behavioural responses that are needed to understand the roles; some of them take place in a dyadic relationship (reflection, adaptation, absorption), whereas others (transmission, transmutation) are relevant in examining the net(work) influences. As regards the position, there are a lot of conceptual parallels with the term role; it can be claimed that actually there is a strong interplay between these terms as well as dualistic interdependency. Often the role refers to processes, and thus carries a dynamic side of behaviour in contrast to the term position, which refers to structures and to the stabilising dimensions in the network. In this study, bipolarism in analysing the terms was suggested and accepted as the theoretical point of departure.

Chapter four describes the managerial view on networks; the expansion relies on the use of Supply Chain Management. SCM still holds a dominant position in modern logistics thinking, though extended versions slightly approach the network based view. The role of space and spatiality is vital in network studies. Instead of considering the concrete location of firms or operators (e.g. hubs, nodes, or facilities) as presumed in SCM-based thinking, the question of how a single firm is embedded in its surroundings should be embraced, including also the aspects of spatial embeddedness. The actors (alone or collegially) perceive and interpret the common space in a different manner based on the basis of their own mental maps. Perceived distance – as presumed in the network view – can be an expression of interorganisational friction. In general, spatiality as a phenomenon is to explain, but not to predict, the interaction in general. Besides, it gives some propositions for the discussion of interorganisational collaboration by addressing both the measures and the nature of the friction and impedance.

In the second part of the study, the details of the empirical part were presented including its stepwise and sequential nature, with forward and reverse-directed acts, and efforts for intermediate synthesis between the stages. The number of participants from different operators was fifteen (focal net), representing actors with and without a business relationship with the focal firm; the indirect relationships were also examined. A case based, qualitative method was employed. In general, and considering the grand view of human interaction (interaction instead of action and reaction), inductive reasoning was mostly utilised. From the empirical point of view, the evaluation is very difficult for two major reasons. First, rail-based intermodalism is very operative in nature. A railcarrier often takes care of the traction in some specified leg including the service for linehaul, and occasionally also loading and discharging. Hence, enhancement of the activities is neither reasonable nor desirable. Second, it is very difficult to analyse interorganisational behaviour, with a remarkable number of actors and a multitude of multidirectional responses. Some of the responses (e.g. adaptation, or exchange) within a dyad are slightly easier to cope with, whereas others (transformation, transmutation) require sensitive methods, in-depth analysis, and a lot of involvement from the respondents' side, as well.

During the recent years the focal company has undergone several changes influencing the chosen course of action. Organisational restructuring, decentralisation of authority and technical and processual adjustments are examples of the progress. With respect to roles and position, adaptations in general are some of the most notable indicators of the embraced roles the focal firm might have.

Regarding the railbased intermodalism, a role typology was created in this study to describe the major orientation in a relationship – for the counterpart as in a dyadic constellation - or for some/many as in other types of relationships. Some behavioural characteristics were added as additional elements to the typology; though difficult to operationalise and verify, mainly three types of responses were presented: proactive, reactive, and interactive. Moreover, the inertia in rail-based IM networks influences the roles of the actors even more than the processual elements of behaviour.

The major role of the focal company in the IM network is that of the common carrier. This role has some typical characteristics, such as executive's intention of expressing strategic will, together with stable and predictable managerial and organisational behaviour. Most important is the notion that the focal company is neutral for all the other operators, and willing to enhance and strengthen the collaboration. This means also that all the accounts are equal in terms of customer satisfaction. Besides, the adjustments intensify the captured role. The focal company is also obliged to its role because there is still a government-established right to maintain solely the railway operations on domestic tracks. As such, the role of the common carrier is affected both by external constraints and by firms' internal intentions. Some of the intentions are targeted for other members in the net, others for the entire IM network. The other roles are extensions of the role of the common carrier.

The other identified roles are the roles of the dominator, principal, partner and subcontractor. Dominator is a net(work) role: it means that the railway company aims at being a leading-edge firm provoking the net members for substantial configurations in their practices. This can cause positive attraction as well. Principal can be defined as a determined and proactive course of action in a dyadic relationship; the network member

is obliged to adopt certain kinds of activities in order to ensure the continuity of the relationship. There are various benefits for the counterpart as well. In this study partner referred to equal collaboration in terms of risk sharing, investments and efforts. However, the question of win-win is problematic, as every positive relationship carries also negative aspects as well: there are also deleterious and harmful effects in the network engagement (involvement vs. adherence). As the subcontractor, a focal firm is obliged to offer traction in some specified legs for their clients; this influences the behavioural responses as well.

The railcarrier can also capture the role of an integrator, especially in international trade, which changes the position as well. It seems that actually the lack of an integrator is evident in *any* IM network, although the expansion and intervention from the forwarder's side could be interpreted as some form of integration. In order to reveal the operational based obstacles for developing IM and the actor and resource and activity-based hindrances, transit and eastbound traffic as well as westbound and domestic drayage were discussed.

The following table contrasts the managerial view to the network view considering both the theoretical findings and empirical evidence. Special attention is paid on the intermodalism as a form of interorganisational behaviour.

Table 8.1 Comparison of Managerial and Network Views in Intermodalism

	Managerial View	Network View
Nodes	formal business organisations and firms	persons, teams, firms, stakeholders
Links	concrete	concrete, relationships
Levels under scrutiny	top managerial mainly	multiple managerial
Character of intermodalism	chain governed and controlled by one organisation	network created and developed by all the actors
Relationships	mainly for business	for progress also
Tying mechanism	mainly contractual-based on partnerships and alliances	diversified based on structural bonds
Nature of behaviour	proactive, reactive	interactive
Entity	extended supply/demand chain	network /nets

8.2. Suggestions for Future Research

The following themes would deserve to be analysed in more detail manner in the future. There is need to investigate the role and strategies of the integrators, whether they be freight forwarders, megacarriers or even railcarriers, especially in international traffic. The recent expansion of potential integrators is interesting, because presumably all the operators in the network must consider or even modify their behaviour to face the intervention.

From analytical point of view, a more comprehensive description of the entire intermodal chain from the beginning (decision-makers' preferences) to ultimate customer and end-user is required. Though challenging, it would provide some new information about the real decision-making. Also, closer analysis of the behavioural responses, considering the need for sensitive methodological applications for in-depth analysis could be valuable. Hence, the network responses should be further analysed (e.g. transmutation) in a broader network context. A network consists of nets. For this reason a network of nets addressing the decision-making procedure could be in focus.

Operationally, there are still many pitfalls to overcome. Identification of the major bottlenecks of IM business and opportunities for expanding the rail intermodalism, if – and probably when – the public authority is stipulating new norms for shifting some of the ITU- based traffic from road to rail is worth analysing. The environmental effects in general, favouring the use of railway transportation should be evaluated in detailed form. The impact of interoperability in general should be scrutinised.

The objective in this study was to portray a different view for railbased intermodal solutions with the network approach, addressing the roles, instead of functions or activities as usually the case. Although some of the ideas proposed represent non-conventional point of departure, the new ideas - as always - will be later converted to conventions and paradigms for scientists. In other words, and in the spirit of paradigm shift in contemporary logistics thinking, the work at hand is an interlude rather than a finale; a continuous process with a clear beginning but no clear end.

In all, there are a lot of challenges left for research, and no doubt the thesis is not a detailed description of the reality from α to Ω . This study is probably more a preliminary attempt for an explanation rather than a comprehensive view to elucidate the details exhaustively - or as Gummesson (1991, 18) points out when stressing the *continuing elements* when generating models, theories, and concepts:

'Science is a journey, not a destination'.

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Appendix 1. Relationship Marketing and Network Approach

As a generic term customer relationship marketing/management (CRM) is similar to other acronyms: it is a bit obscure and vague and rather depictive than informative by nature. Inevitably, under pluralism most of the theoretical conceptualisations have different *contents* depending on application area and/or context. For RM is typical retention of customers through collaborative and partnering activities for the purpose of creating better customer. In a similar manner Grönroos (1995, 11) claims that RM is '*to (...) enhance relationship with customers and other stakeholders at a profit, so that the objectives of all parties involved are met*'. This is achieved through '*mutual exchange and fulfilment of promises*'. The definition suggested by emphasises the role of the business environment (e.g. stakeholders' perspective) and is thus more applicable in the network context. Besides, the concept exchange is strongly underlined.

For constructing RM, Grönroos (1997, 8) suggests three main elements (compare to Fig. 3.2):

- *interaction process*, which is the core of RM,
- *dialogue process*, which is the communication aspect, and
- *value process*, which is the *outcome* of RM.

Wrapping up the different definitions, the central points of RM can be described with the help of the following issues (Olkkonen, 1996, 149):

- co-operative and trusting relationships with customers and other stakeholders; first retention, then the attraction principle,
- collaboration within the company instead of separate specialised functions,
- collaboration with business partners; a company should be trusted by a co-operator in the focal network, and
- RM philosophy requires a focus on resources, core competencies, and value adding activities in the relationship; quality, customer service and marketing activities need to be brought together.

RM can be associated with Supply Chain Management (SCM), third party logistics and general partnering thinking. Hence, some researchers (e.g. Gummesson *et al.* 1997) claim that many of the theories in modern marketing have been created mainly by *practitioners*, not by *theorists*: Japanese *keiretsus*, or Chinese *guanxies*, as well as business networks are examples of contemporary subjects in marketing (compare the formation of keiretsu type of relationship as the final stage in the evolution of partnering, see e.g. Cooper *et al.* 1997, also Castells 1996 exploring these networks extensively). Actually RM philosophy is established in a process, in which there is strong interplay between the scholars and the practitioners in the marketing field (Olkkonen 1996, 140). This means that in traditional marketing science the theory was generated through marketing theorists with powerful conceptual emphasis. In the RM-based view, the theory can be derived from successful practices. Besides, the RM theory is more applicable to a range of situations in contrast to the P- theory, which was mainly created for consumer market purposes. Indeed, there has been a shift in modern marketing thinking during the last decade from the classical Ps to relationship-based analysis in the broader network context. It can be assumed, however, that in the past these fundamentals - interaction, network, and relationships - were implicitly embedded in marketing.

In RM-based discussion the *stakeholders' view is more addressed*; for some of the researchers RM is mainly maintenance of relationships with all the members (the actors) in the micro- and macro-environment. Moreover, *raising the level of abstraction is a prerequisite*; as a consequence the new paradigm will be closer to general theory of current marketing (Gummesson *et al.* 1997, 14).

One critical question still remains: to what extent it is really possible to distinguish between paradigms and related aspects like trends and fads, or mainstreams and buzzwords? Is it justified that RM can be portrayed as a new paradigm in marketing science? This question is important because otherwise the use of more traditional models should be accepted. Moreover, the chosen *analysis method* is more or less a *reflection of current scientific paradigms*.

According to Gummesson (1998; also e.g. Grönroos 1995 and Äijö 1996; Olkkonen 1996,148,149) RM is rather a *philosophy* or a *holistic pattern of thought*. This means that there has been a shift in modelling for two reasons. First, RM is a general theory thus having a lot of applications under different circumstances: it is possible to adjust the theory to diverse types of situations. On the other hand, Möller and Halinen-Kaila (1998, 173, 191; also e.g. Petrof 1997) disagree with Gummesson. For them RM is not a general theory because at least two forms of relationship marketing can be presented: *consumer relationship marketing* and *Interorganisational Relationship (IOR)-marketing*. They argue that there is no developed theory of RM, but rather diversity of theories. Consequently, pluralism is evident. Cova (1994) has examined the recent theoretical debate and he claims that the either-or discussion might not be the relevant in this case. Instead, in postmodern era researchers have to accept two main proposals: fragmentation of marketing theory into many subtheories concerning diverse areas of interest and pluralism of paradigms (Cova 1994, 283). Coherent pluralism means that there is a *convergence of thinking but no leading paradigm* (compare to Fig. 2.4).

Gummesson (1998; also Castels 1996) points out that a '*society is a network of relationships*'. Besides, the use of subjectivity results from the RM- thinking. In his wording, subjectivity is not a concept referring to wisdom or instinct or ignorance or any kind of non-scientific methods. He claims that the complexity of a system (e.g. a system as a set of firms or respectively as a set of relationships) is better analysed by *human, holistic or even emotional means*. Moreover, Gummesson (1998, 116) claims that the appropriate research '*can only be (done) through subjective (individual) reflection and intersubjective dialogue*'. This proposal has several implications for e.g. methodology, data structure and model-testing. In addition to Gummesson (1998), several other scholars call for more subjectivist, action oriented and more empirically grounded methods in empirical analysis (see e.g. Lowendahl and Revang 1998, Tikkanen 1997, Arbnor and Bjerke 1977). Consequently, even the *common sense* can be one of the ideas in scientific examination.

In general, the role of the modern marketing theory is quite remarkable in network studies as well as in modern logistics analysis. Some researchers even claim, that RM actually includes the network aspects (Gummesson 1998, Äijö 1996) or is influenced by the network theory (Olkkonen 1996). Äijö (1996, 15) explains the consensus among the scholars for RM; the conceptualisation refers to '*a close, long term relationship between various participants (network) involving an exchange of value (total marketing process)*'.

Möller and Halinen-Kaila (1998) have evaluated the metatheoretical roots of marketing theory. They classify RM to consumer relationship and IOR. They draw the conclusion that the underlying assumptions are not the same in these two approaches, but they represent even polar views. In the consumer relationship form of RM, competition is the dominant force and the resources are substitutable. In interorganisationally-oriented RM, the actions performed by the actors are shaped both by competition and co-operation. Besides, the heterogeneity of resources is a basis for the collaboration. If so, resources are not substitutable. In order to lay a basis for further discourse, they suggest two terms for studies: '*extended RM*' and '*limited RM*'. It could be summarised that the consumer form of RM *has parallels with the managerial view* and considering the metatheoretical underpinnings, is thus close to supply chain theory.

Tikkanen (1996, 90, also Tikkanen 1997, 229) has compared the managerial approaches in marketing science by presenting the following illustration:

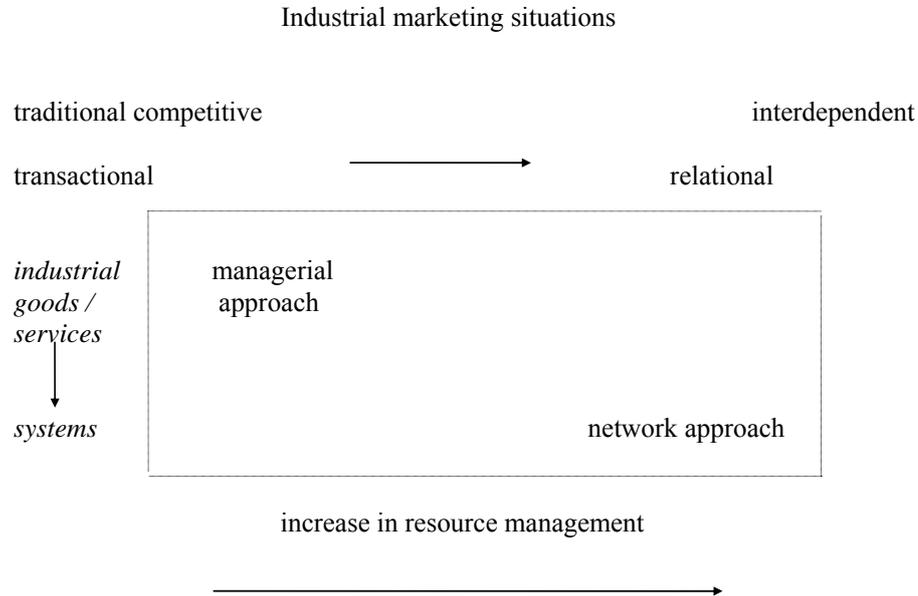


Figure 1 Two Distinct Approaches in Industrial Marketing Situations

The figure shows that the underlying assumptions of the network theory are valid. The network approach is applicable to situations in which the partners are looking for better performance by means of collaborative total optimisation. According to Tikkanen (1996) 'managerial' refers to several approaches including some marketing schools, as well. Accordingly, managerial means research and analysis for which 'their ultimate goal is to determine and prescribe efficient governance structures and managerial models for industrial marketing' (op.cit. 89). The markets are organised according to stimulus-response-pattern, where the dominator or initiator acts in a deterministic way. In contrast, in the network voluntaristic acts are underlined and the actors are continuously searching for co-operative activities.

Appendix 2: ARA-model

Actors

The actors can be individuals, groups of individuals, firms or groups of firms. Furthermore they have several features (Håkanson and Johanson 1992, 28-30):

- actors perform and control activities; the determination which activities are going to be performed is done jointly or alone; they also make the decision on how these activities are to be performed, and which resources are to be utilised when performing the activities,
- through exchange processes actors create relationships with each other; each actor is embedded in a network of more or less relationships, which gives the actor access to other actors' resources,
- actors base their activities on control over resources; such control can be direct or indirect; direct control is based on ownership, whereas indirect control is based on relations,
- actors are goal-oriented: generally the main goal is to increase the actors' control over the network, and
- actors have different knowledge about activities, resources and other actors in the network; the knowledge is primarily developed through experience with activities in the network.

The *focal firm* as a central actor has not been traditionally under consideration in network studies. The difference between the Nordic School and American tradition is remarkable. Tikkanen (1996a, 29, 30) is of the opinion that in America the concept of strategic network is established as *one individual firm as initiator, generator, or dominator* on the marketplace; the findings among the Nordic school emphasise *co-operative network with equal partners*. Thus, a single actor is subject to network influences and to the governance conducted on multilateral basis. This idea has implications on the positions and network identities. In addition, in Nordic network studies the *voluntaristic* nature of the relationships is highly emphasised. This implies that the *role of a dominator*, which includes unilateral, proactive measures with determination amidst web members, is not a valid and justifiable conceptualisation at least from a theoretical point of view.

Activities

Activities can be classified to two categories: transformation activities and transfer activities. In general, activity occurs 'when one or several actors combine, develop, exchange, or create resources by utilising other resources' (Håkanson and Johanson 1992, 30). An activity has a dynamical connotation, as it represents a flow; actually the present behaviour of actors (Araujo *et al.* 1998, 56). Transfer activities transfer direct control over a resource from one actor to another. In addition, 'transfer activities link the transformation activities of different actors to each other' (op.cit.30). The activities defined in the network analysis are close to the activities distinguished by Porter (1985) for *value chains*. For Porter the *primary activities* are inbound logistics, operations, outbound logistics, marketing, and service. Besides primary, also *support activities* are discussed. Furthermore, a lot of similarities exist between *process* and *activity* as terms: *Process* is 'a series of actions directed towards a result', whereas activity is 'a set of acts directed toward a purpose' (Håkanson and Snehota 1997, 52). Despite of the visible parallels, some differences are evident: a *set* does not necessarily mean *sequences* or *sequential*.

In a larger system with interwoven activities, *activity chain* may result. In network theory a chain is understood as an entity or a system of sequential, individual, and interrelated activities; the outcome of each individual activity is referred to as a product (Dubois 1998,25). In this case, activity structure is an entity, in which all the individual activities are tied together on aggregate level. In some particular system (e.g. production) many different chains may arise. Basically two operations are evident in a chain: transformation and transfer.

Single activities are subsequently organised to *activity structures* (Dubois and Waluszewski 1998, Håkanson and Snehota 1997). Under co-operation, the appropriate level is reached when 'two or more organisations agree to match their related plans in advance'. The activities are closely complementary and dissimilar. The activity structure can be defined as 'all the activities needed to create a particular end product and as the way these activities are organised at a certain point in time' (Dubois 1998, 30). More similar activity structures are resulted in a deeper co-operative process in which adaptation is an

essential ingredient. Furthermore in this sense adaptation is close to learning theme, which is undoubtedly one part of the strategical decisions.

Besides activities, some network researchers have considered processes or conducted *processual analysis* in their research work (e.g. Tikkanen 1997). It is possible to identify *three main aspects* for process in related literature (as compiled by Pettigrew 1998): *first*, a process is used as a logic to explain a causal relationship in a variance theory, *second*, it can be used as a category of concepts that refer to activities of individuals or organisation (a process contains several, often but not always sequential activities directed towards a specific purpose; besides sequential the acts/activities can be matrixed, and simultaneous as well intended to fulfil some general and targeted objective); *third*, a process is used as a sequence of events that describes how things change over time (as proposed by Hedaa and Törnroos 1998).

In addition to actors and activities, the third dimension in the ARA model are the *resources*, which are heterogeneous. They are controlled and governed by a single actor or by joint efforts. According to Araujo *et al.* (1998, 56) resources represent stocks of various kinds, for which typical is *tangibility* and *longevity*. There are *three* antecedents for heterogeneity (as pointed out by Easton 1992). *First*, the heterogeneous demand requires the use of heterogeneous resources, which is indisputable (op.cit. 17). In production and marketing these two items are matched. *Second*, the resources are multidimensional in character. The *third* reason is derived from transforming the activity each firm has. In spite of the fact that each firm is individual, in network perspective all the firms are tied with different kinds of relationships to each other. These firms have different roles and the roles are a result of this evolution. In brief, a firm and its resource usage - the transformation - is a result of all the activities, interaction, and interdependencies in the net. This interaction procedure among actors leads to new possibilities. These can lead to an additional source for heterogeneity. According to Easton (1992, 17), '*the interdependence is not just a source of heterogeneity, but also a result of it*'. It should be noted that an exchange as a transaction includes a transfer of resource from one firm to another. Furthermore, it is possible to claim that resources are referred to any value added activity (Easton and Araujo 1992, 65). Resources are linked with activities in the ARA- model. A resource can be even defined as '*any value added activity, service or commodity*' (Halinen 1994, 16). Activities are consequences on the tangible and intangible resources a firm has on diverse managerial levels. Activities are generated through resources controlled and governed e.g. by a single firm, pair of firms, or a net.

Some classification has been made (Woxenius 1998, Bukold 1993) for IFT in accordance with the network approach to utilise the basic constructs of the ARA- model in analysis. In *activity analysis* the following six categories can be found:

- road haulage, terminal handling, rail haulage, supporting activities (e.g. inspection, cleaning, storage of containers, handling of documents), transport arrangement, and marketing to shippers.

For *resource analysis* the following items have been categorised:

- ITUs, lorries for local road haulage, terminals including the equipment for transshipment, rail wagons, rail engines, and information systems.

The infrastructure is common for different transportation modes, so it is not treated as a resource. In *actor analysis* the following organisations have been distinguished

- shippers, forwarders, intermodal transportation companies, (e.g. ICF, UICC; national operators/intermediaries without own marketing performance), MTOs, road hauliers, terminal operators, railway administrations, national railway companies and their subsidiaries, and mega carriers.

In intermodal business, the actors (e.g. operators) have traditionally worked with the resources over which they have direct control. The terminals, including the depots in seaborne trade are governed by one actor; a fact that causes contradictional opinions among the shippers. The resources are tangible in nature, and hence intangible assets are not included. Besides, the Woxenian analysis explains *actors* rather as *organisations*; Woxenius does not distinguish between personal and human actors and firms, which are more typical in network the domain.

Finally, it is possible to suggest *extended dimensions* of the basic model, as depicted in figure 1 (adapted partly from Blankenburg *et al.* 1999).

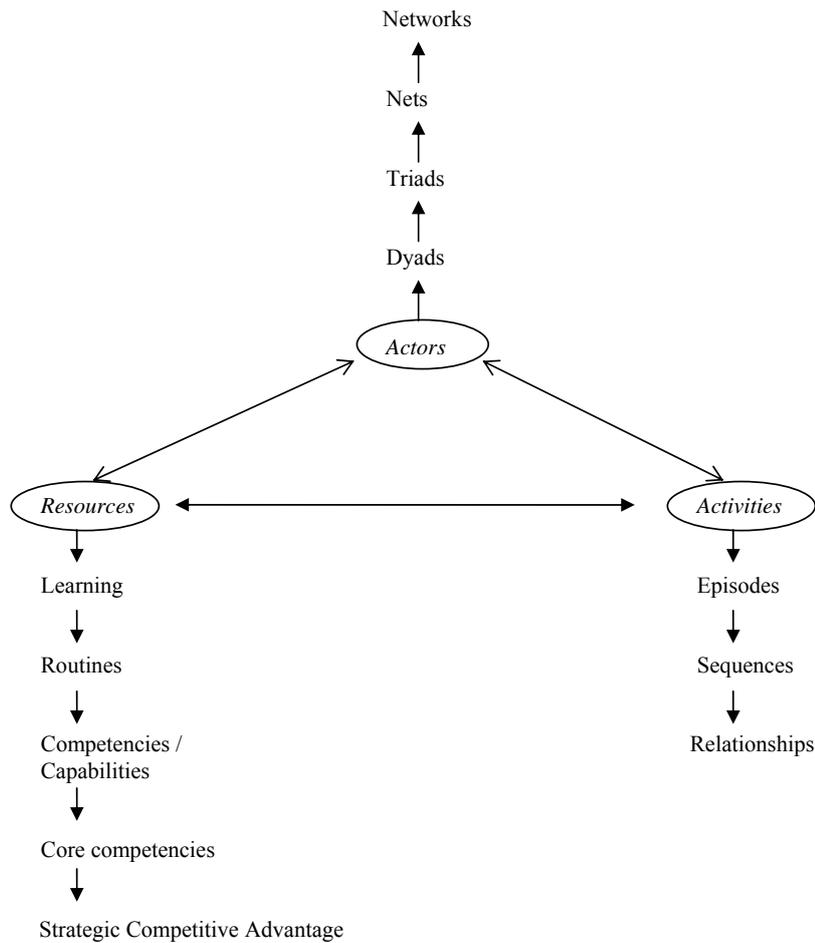


Figure 2 Proposal for Extending the Components of the ARA- model

The shared and independent activities, whatever they might be, are determinants for creating synergetic value: conventionally this is achieved through scale economies. Under the network approach, however, the synergetic objectives are achieved through voluntaristic, deep, and strengthened co-operative efforts enabled by the relationships through network-wide performance and by integrative means between and across the borderless firms. Subsequently, the total effect should be greater than the sum of the single efforts taken independently.

Appendix 3: Letter to Potential Informants in the Focal Net

12.2.2002

SUBJECT: DOCTORAL THESIS IN INTERMODAL FREIGHT
TRANSPORTATION

Dear Sir/Madam,

I work as a lecturer of Supply Management at Lappeenranta University of Technology, Business Department and I am going to write a doctoral thesis on intermodal and combined freight transportation systems with special reference to a railway company. The empirical part of the study will be conducted by interviewing the actors. I did my licentiate thesis in 2000; the work was a part of the national KETJU- programme. My aim is to examine the models considered in the licentiate thesis in the real-life context. For this reason I ask for your cooperation.

During the recent years there has been growing interest in analysing intermodalism; probably the latest expression of the increased activity is the work conducted by the Ministry of Traffic and Communication, published in spring 2002. In the study mainly European systems were under consideration, although also the domestic haulage was under scrutiny. In my study the point of departure is different. One of the most important single objectives is to describe and analyse the role and position of railway company in intermodal freight transportation networks. As such, it is a *necessity to reveal the perceptions of the members of these networks with VR Cargo as a focal firm in freight cargo, and more particularly as an operator in combined transportation networks.*

Accordingly, the aim is to discuss the conventional issues of intermodal freight transportation (e.g. interoperability, fleet, routes) in a limited manner. My approach, with a different analytical angle, can benefit the different parts of the network, because a particular function is evaluated differently using different conceptualisation as well; however, they are quite strongly associated with the question of how to develop and strengthen the relationships. Networked companies are often obliged to pursue a network logic, which is different to the logic of the chains.

In practice, what I am asking here is to have an opportunity to interview you or a representative of your company during this spring, either personally or by phone. The interview session would take approximately two hours to complete and the themes of the study will be delivered prior to these sessions.

My aim is to interview the actors of the intermodal transportation to a rather large extent (e.g. road transportation companies, customs, port operators, forwarders). In order to ensure the success and reliability of the research work, it is most desirable that every actor could participate in this study. The contact persons on VR Cargo's side are Mr. Pekka Antikainen and Mr. Juhani Lepisto. The supervisor of my work is Professor

of Supply Management, Dr.Veli-Matti Virolainen from Lappeenranta University of Technology.

I will give you a telephone call during the week 8 or 9, so that we can discuss my research project and of your interest in being involved in it in more detail.

Best Regards

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Mobile 050 306 34 32
Work (05) 621 26 81
Email: Markku.Nikkanen@lut.fi

Appendix 4. Conducted Interviews in Chronological Order

Name and Position	Time	
Ahrela, Jouni, Marketing Director, Steveco Oy, Kotka	10.3.1999	14.00 - 15.30
Parikka, Olli, International Marketing Director, Straightway / Kymenlaakso Chamber of Commerce, Kotka	1.4.1999	09.15 - 11.45
Kauranen, Eero, Customs Enforcement Inspector, Vainikkala Customs Office, Lappeenranta	12.5.1999	10.00 - 11.30
Heikkilä, Heimo, Port Manager, Port of Hamina	20.5.1999	10.00 - 12.15
Seppänen, Ilkka, Regional Manager, VR Cargo East-Finland, Kouvola	24.5.1999	14.00 - 15.15
Arminen, Lassi, Managing Director, Port of Kotka Ltd.Kotka	25.5.1999	10.00 - 12.30
Koso Kari, Product Manager, ASG European Road Transport, Hamina	25.5.1999	14.00 - 16.15
Anckar, Niklas, General Manager, Steveco Oy, Steveco Transit, Kotka	28.5.1999	10.00 - 11.15
Laurila, Airi, Office Manager, Transfennica Ltd. Hamina	1.6.1999	10.00 - 12.15
Lumme, Hannu, Head of Railship Services, Finncarriers, Helsinki	16.6.1999	10.00 - 11.50
Tapaninen, Ulla, Manager, Environmental System, R & D, Finncarriers, Helsinki	16.6.1999	10.00 - 11.50
Antikainen, Pekka, Station Manager VR Cargo, Helsinki	1.11.2001	10.00 – 11.45
Lepikkö, Juhani, Production Manager VR Cargo, Helsinki	1.11.2001	10.00 – 11.45

Wilenius, Kenneth, Traffic Manager Containerships Ltd, Helsinki	6.3.2002	12.00 – 14.00
Kummala, Mauri, CEO Oy Transpoint Ab, Helsinki	12.3.2002	10.00 – 11.45
Antikainen, Pekka, Station Manager VR Cargo, Helsinki	13.3.2002	10.00 – 12.15
Lumme, Hannu, Manager, Railcargo Services Finnlines Plc, Helsinki	13.3.2002	14.00 – 16.20
Kaisla, Karl-Gustav, Key Account Manager Finnlines Plc, Helsinki	13.3.2002	14.20 – 16.20
Svensson, Kaarlo, Traffic Manager Kelpo Kuljetus Fi Oy, Vantaa	20.3.2002	10.00 – 11.45
Sammalisto, Petteri, Director Finnsteve Oy Ab, Helsinki	22.3.2002	10.00 – 12.00
Gädeke, Jan, Deputy Managing Director Speed Company Ltd., Helsinki	2.4.2002	14.00 – 15.50
Rahkola, Kimmo, Sales Manager Speed Company Ltd., Helsinki	2.4.2002	14.14 – 15.50
Juvonen, Pertti, CEO Wagonrail Oy, Laukaa	10.4.2002	11.00 – 13.45
Laurila, Airi, Office Manager Transfennica Ltd., Hamina	17.4.2002	9.00 – 10.45
Herrala, Seppo, Managing Director Port of Hamina Ltd.	24.4.2002	9.00 – 12.15

Appendix 5: Themes in the Interviews Added by a List of Bonds

Background

- Role, position and tasks of the informant in the organisation
- The tasks and parts of the informant's own organisation in IFT
- How important VR Cargo is for your business, especially in IFT
- Generally speaking, what kind of a partner VR Cargo actually is

Railbased Intermodal Freight Transportation Networks

- On a general level, assess the current state of railbased IFT in Finland
 - What particularly would require improvement
- In your view, what are the most important actors in IFT
- What kind of changes have there been during the recent years
 - How have these changes affected the roles/positions
- What specifically needs improvements
 - Revealing the obstacles for e.g. success, efficiency, and profitability in the intermodal networks considering all the participants (e.g. roles) activities (e.g. lack of coordination) and resources (e.g. terminals and nodes, inefficiency while exploiting the hub-and-spoke- systems)
- What are the major participants of the railbased intermodal industry
 - On local, national, and international levels, respectively
 - Which actors are the
 - Initiators
 - Actors with proactive measures
 - Reactors with reactive measures
 - Service integrators
- Regarding the VR Cargo, does the organisation has the capability to influence the development in IM business
- In all, to what can extent the railway company influence the development

Defining the Role and Position of the Focal Firm

- Considering IM business, what is - or could or should be- the role of a railway company
- What are the major tasks for a railway company
- Have you identified any changes in the role of the focal actor recently
 - What were the implications for the counterpart / for the relationship /other participants / other relationships in the network
- How would you define the position
 - Strong, weak, dominant, latent
- With whom – naming the actors – should VR Cargo strengthen the relationships
 - Why
- Are there any actors with which VR Cargo has not yet created a relationship, but should do that
- In brief, what is the role of the other actors in the IM network

The Development of the Relationship/s

- When did the relationship under consideration actually start
- Tell me briefly the history of the on-going relationship, when thinking about the development
 - Especially the motives for deeper collaboration under scrutiny
- What have been the most influential and remarkable events during the last year
 - Why
 - What makes them so important
 - Who was the initiator
 - Outcomes
- In your view, what have been the quiet and tempestuous periods
 - Why

Current Situation in the Relationship: Perceptions of the Counterpart on General Level –that is a Railway company *vis-a-vis* another operator

How important the counterpart is

On a general level, what kind of a partner is VR Cargo / other railway company actually

What is the current nature of the relationship

What keeps the current relationship going

What expectations exist ?

What are the main characteristics of a well-working relationship

What conceives trust

Do you have shared values, risk, yields, rewards etc.

Is the question of synergy a theoretical consideration only

Why or why not

Is the concept partnership an appropriate term to describe the current relationship

Analyse the benefits (qualitative, quantitative) of collaboration

Degree of satisfaction in general

What have been the main sources of dissatisfaction during the time

What prevents the deeper co-operation

Major problems and minor ones

What is the conflict resolution procedure

What are the risks because of less independency

Can you control the counterpart and - if possible – how

e.g. use of resources and their allocation, decision making on different organisational levels, future orientations, working practices etc.

What are the possible positive consequences *for other relationships* because of deeper relationship and co-operation with one actor

What kind of *daily transactions* do you have with a counterpart

What ties you up with the counterpart

Analysing the bonding mechanism (see the attached list)

What kind of adjustments and adaptations have you done because of the counterpart

In all, are you obliged to adapt, or adopt when the commitment is generated

Third party involvement and integration (the triadic view)

Intermodal Development Projects: looking for Incremental/Radical Change with Projects (just if any particular projects evident)

Tell me briefly about the history of the this particular *project*, when considering the event/s

What were the major motives to start a project

What were the major critical incidents

Why are these so important

What was the impulse (relationship - a dyad - and its state – e.g. perceived dissatisfaction, or external)

In your view, is it working

Why or why not

Assessing the results and outcomes of the projects

Incremental, leapwise, radical change occurred

Which actor was the initiator

Identifying the major actor and their role

Why is there need for a new type of co-operation

Did you break or alter the traditional roles while collaborating

Concluding Remarks: Epilogue for Interview Session

Comments, questions, criticism, additional clues from the informant

TYPE OF BOND	CONTENT
<i>Economic</i>	pragmatically e.g. special credit agreements and terms of payment; comparable to structural bonds, is dependent upon the satisfaction with the term of the current exchange; price and cost the most appropriate details in the content; in general the TCO is the most appropriate tool for assessing the economic benefits; however, possible to reveal relationships without economic element
<i>Legal and financial</i>	e.g. long term contracts; maybe less binding than they appear; can be a signal for parties that because there is need for a legal bond other forms may not work well
<i>Technical</i>	e.g. common technology, process adjustments
<i>Cognitive</i>	e.g. knowledge about the counterpart; partners have gained a thorough understanding of each other
<i>Social</i>	e.g. mutual confidence and trust including personal linking; on a company and personal level; also different forms of social exchange like friendship or diverse spare time activities; besides mutual commitment, which is more a less an outcome of a long-term relationship, also investment, trust and attachment/attraction can be posed
<i>Communication - (subcategory to social)</i>	e.g. spoken words in interpersonal interaction expressing trustworthiness, how arguments are explained and how do they strengthen the social linkage between two actors; the slang, expressions, and rhetoric in general; how information is decoded and encoded; the significance and strength of non-verbal communication; the use of communication appliances in personal interaction; the frequency and intensity of the contacts in communication
<i>Planning</i>	e.g. functional co-ordination
<i>Time-based</i>	e.g. dependency on delivery times and other time related issues; delays when promises should be kept; also a flexible appointment system; in general the interpretation of time and willingness for time compression, it assumed, that the time related bond is for linear time measure; time is inherently associated with culture and non-linearity is evident among many business cultures
<i>Administrative</i>	relate to administrative routines and procedures; close to organisational aspects: a sub-category for organisational
<i>Organisational</i>	the organisational issues between parties in general manner

Appendix 6: Grounded Theory as Coding Protocol

The basic constructs of the narrow grounded theory were – enoughtrough roughly and intuitively - applied in the first stages of the study. For a common, general grounded theory the following *three targets* can be manifested (Glaser and Strauss 1967, De Burca and McLaughlin 1998). *First*, the theory adopts a *process perspective* as opposed to a unit perspective, *second*, it positions itself as applicable for practitioners by taking a social psychological level of *analysis*, and *third*, it *defines the research problem* from the perspective of the *focal actor*. Regarding the different forms for utilising the method, two perspectives can be distinguished: the ‘full’, which is the approach that comprehensively utilises all the aspects of the grounded theory. In his view much of the grounded ideology is ‘partial’, which means that there is an iterative procedure in which data is collected first and then theoretized.

The grounded theory is actually not a specific method or a tight technique, as Strauss (1989, 5) states: ‘*it is a style of doing qualitative analysis that includes a number of distinct features*’. Besides a method, grounded theory is a *coding practice* (Ellram 1996) in case studies: a three-step coding protocol is commonly used in many logistic surveys. Furthermore, this implies that numerous researchers, when utilising some form of case studies, are in fact using implicitly, and even unconsciously the coding procedure typical for the theory. The coding procedure is included in the the definition of general grounded theory (Strauss 1989, 22, 23): the grounded theory ‘*is a detailed grounding by systematically and intensively analysing the data (...) of the (...) interview (...) by constant comparison. Data are extensively collected and coded (...) thus producing a well-constructed theory. The focus of analysis is not merely on collecting or ordering a mass of data, but on organising many ideas which have merged from analysis of data.*’ With coding practice, the concept - indicator model is essential; it directs the conceptual coding of a set of empirical indicators (Strauss 1989, 25). These indicators are the smallest units in interaction processes: the behavioural actions and events described in documents or in the words of interviewees. As stated earlier, a basic construct - *an activity* - consists of acts, or actions performed by *actors*: individuals on microlevel, or groups of firms on macrolevel, even alliances or other types of blocks between firms expose themselves in interactive processes.

The indicators generate appropriate concepts as a result of categories, in which the researcher puts them. Strauss (1989) explains three coding protocols: open, axial and selective ones. With *open coding* the aim is to produce concepts that seem to fit the data; these concepts are mainly provisional in nature in a similar way than interpretations are tentative. In practical analysis open coding is the first data coding process associated with methods that ‘*break down*’ case study data. *Axial coding* consists of intense analysis done around one category at time. This should result in more knowledge between that category and other categories/subcategories; it is essential to find and make connections among the categories developed in the open coding stage by searching for interactions and conditions. The *selective coding* method entails coding systematically for the core category; the researcher delimits the coding to only those codes that are related to the core categories (Strauss 1989, 33). Undeniably the coding practices, though often sequentially handled, should be more interactive than linear stages or phases from open coding to selective one.

The core category- thinking is essential because the entire grounded theory is based upon the idea that the generation of theory occurs around the core categories; the core category should capture the predominant behavioural aspects and patterns that are scrutinised - the main theme should be highlighted. In addition, the core category should comprise the main variations in human behaviour. Furthermore, this category is related to other categories that are analysed and explained. The core category should have clear implications for a more general theory (Strauss 1989, 36).

The use of grounded theory as a coding practice requires the researcher to search for core category with the help of coding by analysing and interpreting the smallest units of data often word by word or sentence by sentence or – as in this thesis - idea by idea. In the preliminary discussions, the interviewees were allowed to *express and depict the reality by their own wording*. There were some themes, and some issues, which were asked. The theoretical models for intermodalism have a strong articulation, which is quite a conceptualised portrayal and have just some collisions with the real-life situations, including wording that is not applicable in the practical transportation world. The use of semi-structured interviews allowed the interviewer to steer the the direction of discussion slightly. Besides, it allowed the respondents to express their own attitudes and opinions; thus the theoretical method could be classified as ‘*theme interview*’ for which it is typical that the themes of the investigation are known, but the method

does not require the use of constructed questions (Hirsjärvi and Hurme 1985). To ensure the validity in the preliminary stage, actually two researchers, both studying intermodalism, compared the findings and ideas later by contrasting the notes and the transcribed memos. The double-checking was an assurance of more comprehensive understanding. In logistics research there is often a sequential research procedure, which implies that *first* there is a model, theory, or hypothesis to be analysed, and *second* there are empirical facts on which the theoretical propositions will be subsequently *tested*. In this thesis, however, the linearity is different.

Appendix 7: Finnish Railway System in IFT and Actors of the Focal Net

In Finland, the transportation of unitised goods by rail is performed by VR Cargo, which is a strategic business unit of VR Group Ltd. As regards freight transportation, Oy Pohjolan Liikenne Ab as a subsidiary of the Group, and more particularly Transpoint take care also of the movement of unitised goods. The Group is owned by the state of Finland. Intermodal freight transportation can be divided to international and domestic traffic. As regards international cargo, in eastbound traffic there is a regular container service from Finnish ports to St. Petersburg and Moscow and, in association with its partners, to Nakhodka Vostochny/Russia via the Trans-Siberian railway (TSR). The TSR connection for containers is based on the use of scheduled block trains. Since the beginning of 2003 there has been a huge increase in the number of conveyed containers, with the amount of nearly 100 000 TEUs per year. As such, TSR combines appropriately two continental markets, Europe and Far-East/Asia, which means that the operators in Finland, and more particularly in the local net offer services in transit traffic. The westbound drayage relies on the use of railferries, requiring co-operation with KN Nordic Rail through the Port of Turku (destinations in the Continent and v.v.) and SeaRail (destination Scandinavia and v.v.), also using the Port of Turku as a hub in Finland.

On domestic tracks VR Cargo transports ITUs between Helsinki-Pasila/Turku/Tampere/(Lahti) – Oulu/Tornio/Kemi. The service is performed in cooperation with some operators with whom VR Cargo has a direct or indirect relationship. Some of the operators involved in IFT (a focal net) were chosen to the present study and are briefly described below (the member of the focal net is printed in **bold**)

Finnlines is a shipping company with main focus on liner cargo services. The company offers e.g. regular ro-ro service in the Baltic Sea area, but is also engaged in port operations under the name **Finnsteve**, e.g. in the Port of Helsinki. The service provided by Finnsteve consists e.g. of container feeder stevedoring using container terminals and depots. **Speed-Company Ltd.** uses the Port of Helsinki as well as some other Finnish container ports for unit transport particularly generated for shipping companies and their representatives; the company mainly repositions empty containers with the help of VR Cargo between Finnish ports. Also **Containerships Ltd.** is mainly located in the port area, offering container service (ISO standard, Magnum size pallet-wide as a modification) for clients under door-to-door- conditions; the task of the focal firm of the study is to give an inland service in the haulage of containers. In the Port of Turku the company takes care of the rail ferry operations for KN Nordic Rail, which is a part of Ferroviasped (owned by Kuehne & Nagel); the present service is based on the service given by **Finnlines (Finncarriers) Railship Service/Railcargo Services**, when they sold these activities to K & N. Because of the different gauge in the Continent, the European bogeys have to be replaced in the port before entering the Finnish railway network.

Besides Ports of Helsinki and Turku, also the **Ports of Hamina** and **Kotka** (now both limited companies) are of great importance for combined traffic in exportation/importation/transit. The Port of Kotka has made investments for Kotka Container Terminal in the Mussalo area to improve the conditions for more effective container handling; the port operations are made by **Steveco**, which is specialised also on e.g. handling the containers. The Port of Hamina and its subsidiary Hamina Multimodal Terminal aim at increasing traffic *en destination* Russia, because of the a new link between Continent-Moscow with ITUS to be transported by **Transfennica**. Transfennica has created regular liner shipping service mainly in the Baltic Sea. **ASG Eurocargo** is situated in the Hamina Port area, specialising in traffic to Russia with some VAL activities; thus the local area is a gateway for transit operations. In eastbound traffic the role of the **customs** is essential, as it guarantees flexible export/import/transit operations. During the recent years this role has changed from inspecting activities to facilitating reliable and fast border-crossing. Situated in the local net, **Straightway** is a marketing company having a close relationship with most of the international traders in the net promoting and representing these companies; especially potential transit customers (Europe, overseas) are served.

In domestic haulage, **Wagonrail Oy** transports special containers of beverages from Tornio to (Konala/Capital area)/Lahti. **KelpoKuljetus Oyj**, owned jointly by Suomen Posti Oy and DHL ((Danzas)/Deutsche Post World Net) uses railway cars to carry semitrailers in northbound/southbound traffic (Helsinki-Oulu-Helsinki). **Transpoint** as an affiliate of Oy Pohjolan Liikenne Ab conveys ITUs, mainly semi-trailers, in both directions.

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