

ANALYSING BUSINESS INTERACTION

David Ford, Lars-Erik Gadde, Håkan Håkansson, Ivan Snehota, Alexandra Waluszewski

ABSTRACT

This paper develops a conceptualization of the nature of business interaction drawing on the empirical work of the IMP Group. The paper suggests that business interaction can be interpreted as a confrontation process that occurs *between* companies and which *changes and transforms* aspects of the resources and activities of the involved companies and of the companies themselves. The suggested substantive nature of the interaction gives it an existence in time and space, which in turn has important consequences both for the structure and for processes within the economic landscape. Interaction will in this way become at heart of business development.

THE IDEA OF BUSINESS INTERACTION

The idea that interaction between individually significant actors is a primary characteristic of the business landscape is a basic observation in the IMP studies. (Håkansson, ed, 1982) The implication of this observation is that it is not what's going on *within* a company, but *between* companies that constitutes the doing of business. But what is so special with this starting point? The idea that interaction is central to economic life will not be a surprise to any economic researcher. However, there is an important difference in how interaction is approached in theories influenced by mainstream economic thinking and the view that has emerged in the IMP setting¹. In approaches colored by a traditional market assumption interaction is a simple mechanism; the exchange is carried out by independent actors in processes which are instant, free from friction and which furthermore are generalisable. (Wilk, 1996) Thus, what market theory has contributed with is, as Marglin (2008, p. 2) puts it, the common understanding that exchange takes place within “a system that not only regulates itself but also regulates ourselves, a process that shapes and forms people whose relationships with one another are circumscribed and reduced by the market”.

The empirical studies carried out in the IMP setting outlines a view of interaction which is very far away from this simple mechanism. The basic difference is that the interaction that has been observed in the IMP setting has a *substance*.² The substance of interaction can be described in several ways, but it always affects the people and things involved. Physical as well as human resources by each of those involved in the interaction will be affected by this. One important consequence of this substance is that interaction always involves costs for each actor. But even more important is that

¹ A number of these studies may be found at impgroup.org.

² Similar observations have been made by a number of other empirical oriented scholars in other fields of research; see e.g. Hughes, 1983, Latour, 1984, von Hippel 198 ,Wilks, 1996, Van de Ven et al, Marglin, 2008).

the benefits of interaction seem to outweigh these costs in enough cases to make it impossible for any company to disregard it.

Interaction can be interpreted as a confrontation process that occurs *between* companies and which *changes and transforms* aspects of the resources and activities of the involved companies and of the companies themselves.

For example, the confrontation in the interaction may lead to one of the companies modifying the product and service offering that it supplies to a counterpart whilst it may lead the counterpart to reorganize aspects of its operations in order to accommodate that offering. But interaction isn't just a dyadic process. All companies simultaneously interact with several others and interaction between any two companies may in this way affect their interactions with these others. Connections between interaction processes lead to modifications to activities, resources and to companies across many company and organizational borders and changes in how these elements relate to each other. Thus, the connections between interactions give the business landscape a shape that can be depicted by the network metaphor.

This implies that interaction isn't just one of the activities of a business. Instead it appears to be the major means through which companies systematically relate and combine their activities and resources to each other. Interaction affects all of the activities and resources that are spread widely across the network and all of the companies in the network. It is through interaction that the benefits of these resources and activities flow between and into the companies in the network. As well as being a ubiquitous *process*, interaction also forms a working *structure* for the network and provides an element of stability to how different companies relate to each other in the network. But as well as being the means through which companies address their respective problems, interaction may also *generate* problems for the companies and conflict between them. Interaction may lead to change and dynamism in companies as well as leading to cooperation and stability. Interaction is driven by and

produces a world full of different and often conflicting interpretations of the meaning of the particular business behavior of different actors. It is often difficult or impossible for those involved in the network world to separate the individual actions, re-actions and re-reactions of each actor or to trace their causes, effects and outcomes. In this way interaction presents numerous problems for all the people working in companies, are affected by companies, tries to affect companies – as well as for the researcher.

Thus, there is a considerable gulf between the concept of market exchange and the concept of business interaction. This gulf means that in order to understand the interactive world we have to investigate and understand a number of its different dimensions as well as its outcomes and drivers. Basically all traditional business research areas; purchasing, marketing, innovation, strategy, policy, etc, stands out in a different light if we abandon the market theory's assumption of interaction as a simple mechanism for an understanding of interaction as having a substance.

In this paper we will use the first section to describe some of the characteristics and range of what's going on between companies – in interaction. In the second section we will try to conceptualize interaction in order to be able to use it as a research tool. That means trying to develop a model that can help us to characterize, categorize and explain at least some aspects of business interaction. To do this, we will relate interaction to the two key dimensions of the interactive world; time and space and seek to demonstrate that in researching interaction these dimensions have to be brought to centre-stage.

EMPIRICAL INTERACTION PROCESSES

Interaction takes a wide variety of forms in the business landscape. Some interaction processes have a very long history whilst some others are more spontaneous. Some relate to the movement of large volumes of physical products, other interaction involves none. Some interaction processes include

complicated technical problem-solving, whilst others are very simple from this point of view. The variation is immense. When we try to portrait some of this variety we will start with a category of interaction that we believe is the most central from an economic point of view in the business landscape. This category is the interaction processes between particular companies that become so significant to those involved in them that they acquire some quasi-organizational features, or the interaction becomes a *business relationship* (Blois 1972). This type of interaction process can extend over many years and involve many resources, activities, individuals and many different type of problem solving. A typical development may look like this:

The production, delivery and use activities of the two companies may have been closely adapted to each other; Both physical and human resources may have been adapted and combined in specific ways; There may be hundreds of people from each side that have more or less frequent contacts with a similar number of people on the other side; The two companies may have accomplished a number of projects together and there may be one or more continuing at any one time; The interaction may have become quite structured and specialized involving specifically designed offerings and procedures by either or both of the companies; Some parts of the interaction such as the coordination of deliveries or service events may have become standardized or automated. Other parts may relate to a particular problem of one or more of the participants or be project-related and involve considerable change, uncertainty and resource investment for those involved or be restricted to a specific time period. Other parts may involve detailed negotiation and development to integrate different activities and resources or even to subsume the actors into a joint organization or company. The interaction processes may be sufficiently critical to one or both of the companies from a volume, profit or technological perspective that they are closely monitored and systematically evaluated by them.

Each of these relationships is unique. In each of them the interaction process is very “heavy” and will have involved and changed substantial aspects of the activities and resources of each of the companies. These changes affect the specific interaction and also others in which the companies are directly involved and those more widely across the network. The total investments of the two companies in these continuing interactions are considerable and their effects are highly significant. A limited number of these interaction processes often dominate a particular company’s operations and can realistically be said to have *formed* that company.

In contrast, the business world also contains many much more limited interaction processes between companies that may be either ad hoc or short term. Some of these processes may be intense and involve important problem solving or leave significant imprints on the companies concerned. Other interaction processes may be less significant or intense but may still be valuable. For example, they may involve a supplier and many of its customers that only buy occasionally, but with whom the interaction can be standardized to reduce costs. Another example of ad hoc interaction could be in the case of a supplier who is able to contribute a specific technical solution that is crucial for a particular customer.

There are also a large number of interaction processes, which involve more costs than benefits for one or both of the counterparts, despite (or because) of the efforts of those involved. Others may be in the early stages and may or may not develop into long-term and important interaction processes. It is often difficult to evaluate these developments and most companies have to engage in a large number of such interaction processes just in order to find the few that are worth developing further.

Because interaction is a process over time, it is likely that connections will develop between different interaction processes in which the two companies are involved. These connections may be both more or less systematic and more or less conscious. But their outcome is that through participating in a single interaction process with a single counterpart, a company becomes related to a set of many

others about which they may know little or nothing. In this way, business interaction is a process in which ideas, solutions, technologies and problems and interdependencies are transferred across a network of companies.

Interaction between companies enables each to take advantage of an economic world characterized by continuous change, but with many potentially cooperative or at least mutually beneficial counterparts. Continuing interaction with others provides some kind of stability in a world of unpredictable outcomes and unknowable influencing factors. In this way, interaction is both a dynamic and a stabilizing force.

AN INITIAL CONCEPTUALISATION OF INTERACTION

We will use three simple diagrams to develop an initial conceptualization of interaction (Figures 1, 2 and 3). A first step will be to make a distinction between the ideas of interaction and of exchange. The idea of exchange is based on the transfer between actors of *unchanging* entities; products, services or money. Exchange can take place without there being any significant intervening process between the counterparts. A simple example of exchange occurs when someone buys a newspaper from a street vendor, the exchange of coin for paper involves no alteration to either of the exchanged items and the only interaction is a polite “please” and “thank you”. This idea of exchange is represented in Figure 1. Thus we can interpret exchange as a “mechanism” that connects the actors for the time of the exchange, but which does not have any content of its own. In general terms this mechanism is discussed as the “market mechanism”. The functioning of this mechanism without any independence of its own makes it a very powerful theoretical construct that works as an invisible hand. It assumes that the parties have all necessary knowledge and that the objects exchanged are given.

However, the typical situation that we have observed in the business landscape and illustrated above is rather more complex than this picture of exchange suggests. This is because there seems to be some sort of transforming process that occurs *between* business actors. This process and its content may from an analytical point of view be separated from the two actors themselves. This separated interaction process is pictured by the diagram in Figure 2.

FIGURE 1: EXCHANGE



FIGURE 2: INTERACTION

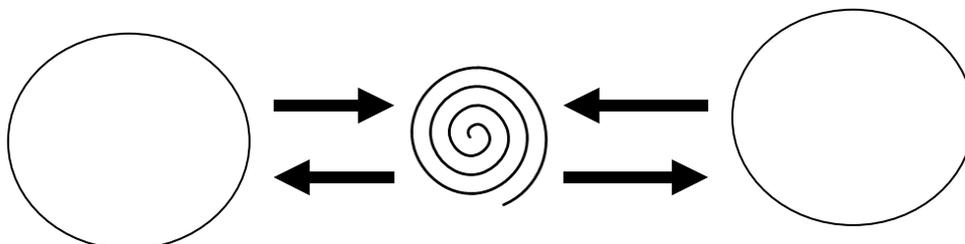
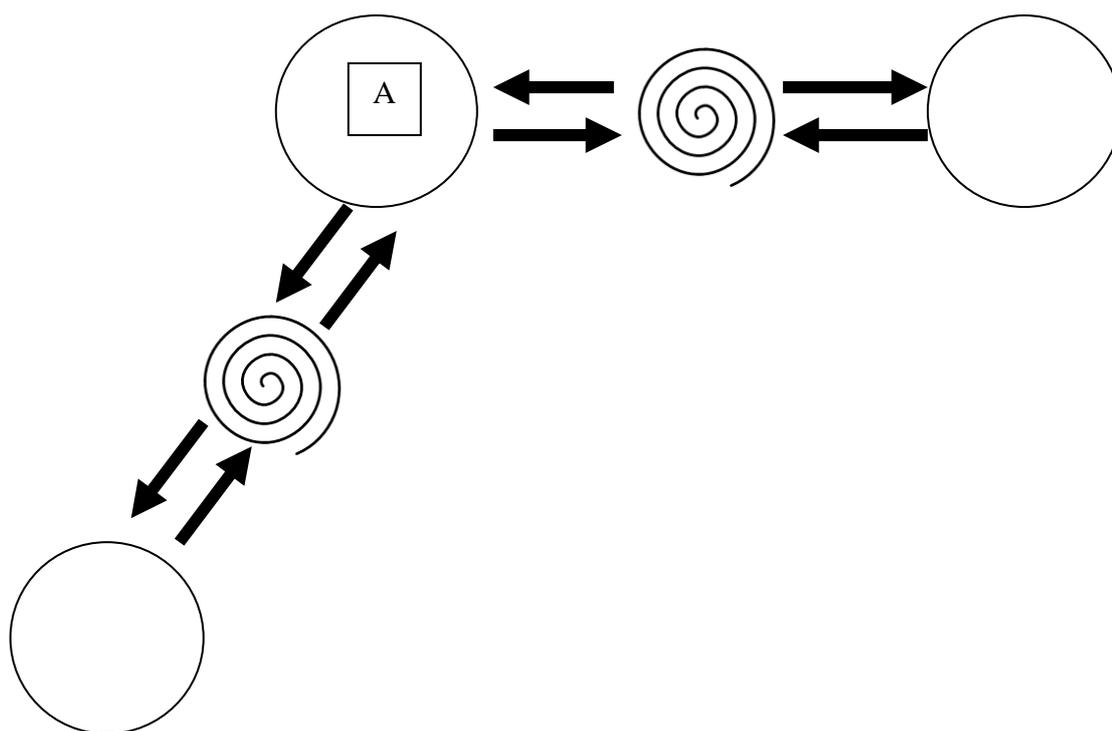


FIGURE 3: INTERACTION BETWEEN THREE COUNTERPARTS



This way of conceptualizing the interaction assumes that interaction is a process that occurs between actors over time, that gets all its content from the two actors but which develops in a way that is not fully controlled by any of the two. Over time, interaction will in this way affect what each actor

contributes to and receives from the other and also affects the actors themselves and their activities and resources. Figure 2 should be interpreted in the following way:

- The spiral at the centre of the figure is a representation of the process of interaction from which emerge products, services, deliveries, developments, adaptations and payments, each with their particular characteristics and timing. The arrows *to* A and B *from* the spiral represents A and B's interpretation and assessment of what has emerged from the interaction and what has been their counterpart's intentions and approach to it. These interpretations relate each actor's assessment of its own approach; to their problems and aspirations; their resources and activities and to their other interactions and their positions in the wider network.
- The form taken by the evolving outcomes of interaction is affected by the approaches to the interaction of both of the actors. The arrows *from* A and B *to* the curve represent A and B's respective approaches to the interaction between them. These approaches may be manifested in many forms, such as the "quality" of a service delivery; the effort (or lack of it) that is devoted to a product adaptation; the stance taken in a negotiation; the timing of a payment or the commitment to a joint development. Some of these approaches to interaction may be in line with a clear intent or strategy by one or both of the companies. But some or all may be unconsidered, inconsistent, or be the result of inertia and simply continue the status quo. These approaches may be oriented towards a single episode of interaction. They may be unique to a particular counterpart or be part of an attempted common approach to a number of counterparts by either of the companies. It is likely that there will be inconsistency in the approach to interaction with a single counterpart, both between different individuals in a company and by that company over time³.

³ Ford, Håkansson and Johanson, 1988)

The spiral indicates that interaction is an evolving process. It has no single identifiable outcome or end-point because each output is an input into the continuing process and will be interpreted differently by each counterpart involved in the interaction and by others. The effects of interaction may be both immediate and long term and current interaction is affected by what has taken place previously and by the perceptions and expectations of future interaction held by the actors. Interaction is a process that takes place *between* actors and its content is always produced by more than one party. The two arrows in Figure 2 between each of the actors and the interaction are intended to show that the connection between the approach of each actor to the interaction between them and the outcomes of that interaction is beyond their individual intentions or control. Instead, the interaction between business actors is influenced by their approach or intentions and by the process of interaction itself. This creates an outcome for each actor which in turn will be interpreted by both counterparts.

Each actor probably has a view of the activities and resources they wish to contribute and the approach they wish to take to the interaction. Each probably also has a view of what they want to gain from the interaction. But there is no reason to assume that the wishes of each will be the same in either respect. Each actor has some initial control over their own activities and resources. But the form that these activities and resources subsequently take and how they are delivered to and received from the counterpart is affected by the way that they interact with those of that counterpart. Interaction is an intervening variable between the activities and resources of the two companies as they come together. Interaction changes what is contributed and received by both companies.

Successive interaction over time can lead to outcomes that mean that the activities and resources of the actors and the actors themselves are *transformed* through interaction.

The process of interaction may occur as a routine or without conscious effort or planning by any of the actors involved. In contrast, it may involve extensive planning, development, negotiation,

bargaining or conflict. But irrespective of how the process develops, the interaction of resources, activities and actors means that no single actor is or could ever be in control of what emerges from its interactions or be independent in the world of business.

No actor ever interacts with just one counterpart. The typical situation is that interaction is a more or less continuous problem solving process in which more than two actors are involved as portrayed in Figure 3. Each actor will be taking part in this extended process in order to address their individual problems and each dyadic interaction will be affected to a greater or lesser extent by those with which it is connected.

This leads us to the following initial conceptualization of interaction:

Interaction is the substantive process that occurs between business actors through which all of the aspects of business: material, financial and human and all of the elements of business: actors, activities and resources take their form, are changed and are transformed.

One important consequence of this conceptualization is that business interaction should never be seen simply as communication or negotiation, even if these may be important aspects of it. The greater the involvement of a company in a particular interaction, the greater will be the effects on its own activities, on its resources and on the company itself. Interaction is a cumulative process over time. Hence, the characteristics of actors themselves and of their activities and resources are as much an outcome of interaction as they are an input into it. The actors, activities and resources of business are defined by interaction. This view of business interaction has been refined in the ARA-model.

The A-R-A Model.

The “ARA Model” (Håkansson & Johanson, 1992) provides a conceptual framework of the process and outcomes of interaction, based on empirical studies in the IMP research stream. The model suggests that the outcomes of an interaction process (or the *content* of a business relationship) can be described in terms of the three layers: Actor Bonds, Activity Links and Resource Ties between the counterparts (Håkansson and Snehota, 1995).

The model also suggests that each of these three layers are inter-connected and each affects and is affected by the constellation of resources, pattern of activities and web of actors in the wider network.

The Actor Layer: Broadly speaking, this layer relates to the interpersonal links developed between individuals through interaction. This layer is built on the degree to which the actors see, know and feel close to each other; how they trust, appreciate and influence each other and become mutually committed (Wilson & Jantrania 1994, Wilkinson & Young 1994, Huemer 1998). Bonds that arise between actors may be more or less strong and will influence to varying extent what the individuals involved in a process perceive as possible and feasible directions for that interaction. Actor bonds are important for the “learning” and “teaching” of counterparts about opportunities and solutions, as pointed out in some of the studies of learning in relationships (Dahlquist 1998, Håkansson & Johanson 2001).

The Activity Layer: This layer relates to the more or less extensive integration and co-ordination of activities that may develop between actors. Various activities such as production, logistics, administration, deliveries, information handling and the like may be more or less integrated and linked together. In this way, the two companies’ activity structures can become more or less systematically and tightly linked (Richardson 1972, Dubois 1998, Torvatn 1996). The relative strength of specific activity links, or their absence, in a business relationship has been shown to have substantial economic effects on the actors involved.

The Resource Layer: This final layer relates to how the two actors' resources may become more or less adapted and more or less mutually tied together as their interaction develops. Specific mutual adaptations may concern tangible resources such as physical items of plant or equipment, but may also include intangible resources such as knowledge. Resource ties arise as the two parties in a relationship confront and mutually adapt their resources over time (Hallen et al 1991, Waluszewski 1990). Resource adaptations can make resource usage more efficient. But more importantly, the systematic confrontation of resources also underlies the development of new joint resource combinations in the process of innovation (Håkansson 1987, 1989, Biemans 1992, Lundgren 1995, Laage-Helman 1997, Holmen 2001, Håkansson & Waluszewski 2002, 2007).

The three layers of content of buyer-seller relationships are not independent and there is important interplay between them: Activity links may limit or facilitate resource adaptations; resource ties may limit or favor the possibility of activity co-ordination and actor bonds may open up the possibility of developing activity links and resource ties.

The ARA-model also takes into account another aspect of business relationships, namely that actor bonds, resource ties and activity links do have consequences that go beyond the specific relationship in which they arise. They result from and have effects not only on what is happening between the actors but also within the actors themselves and within their other relationships. The content of a particular relationship can be used by the counterparts to affect their organization, use of resources and structuring of their activities. Conversely, the content of the relationship also reflects the characteristics of the two actors in the same dimensions. Additionally, third parties to the relationship may also take advantage of developments within the relationship. For example, other actors that have relationships with the two actors involved in a relationship and the broader network of businesses can affect and be affected by the ways in which the content of a relationship develops (Easton & Lundgren 1992, Blankenburg-Holm et al 1996, Pedersen et al 2008). Every relationship is

a more or less important connection in a number of webs of actors, constellations of resources and patterns of activities that stretch across many other businesses.

Overall, the content of interaction consists of more than the sum of exchange transactions, communication flows and interlocking activities. The outcome of interaction has important economic consequences and this brings us to two further questions to be addressed by research:

Why do relationships such as those that we have documented in our empirical research arise between businesses?

What makes relationships such a dominating trait of the business landscape, when they can be complex and possibly onerous and difficult to cope with for those involved in them?

A broad answer is that relationships can be source of a wide variety of opportunities and benefits for those businesses despite that they entail considerable costs and limit the independence of businesses. This initial answer now leads us to explore further what is involved in the formation and development of the business relationships.

Interaction and development

The existence of interaction means that it is not enough to look *inside* a business company for explanatory factors in the development of that company. If we want to understand the development of business actors, or their activities, or their resources, or the economic logic between these elements then we have to understand the interactions in which those actors, activities and resources are currently and have previously been involved. This means that if we wish to examine business in an interactive world then our unit of analysis must be the specific process of interaction and how it occurs *between* particular combinations of companies. Similarly an analysis of the development of

business in an interactive world must centre on the development of specific interaction processes rather than on the apparent changes that occur in any single company. These company changes are likely to be more the outcome of those processes than the determining factor in them.

INTERACTION AND TIME⁴

We have defined business interaction as a process that takes place over time and where time is embedded into the process in several ways. Time comprises a major opportunity/problem for all of those involved in interaction, whether as a participant or as an analyst. Time largely defines the nature of interaction as a process in which sequential events are related to each other. But interaction is difficult to delimit in time. Interaction can have no easily identifiable beginning or end. No matter when or where we look at interaction, what we see is the continuation of things from before. This applies just as much to the interactions surrounding the start-up of an *apparently* entirely new company as it does to the interactions involved in the latest delivery of a continuously purchased component to a long-established customer.

A consequence of the importance of time when analysing business interaction is that there is no such a thing as a new network. If we recognise the existence of a particular network for the first time, then we are simply isolating part of a pre-existing and wider network. Similarly, neither a new actor nor a newly developed relationship creates a new network. Instead, new actors and new relationships always emerge from something that pre-exists them and there is always a history behind them. Each new actor or relationship is always related to others that already exist. A new actor will have some, but probably a rather limited effect on the *existing* network. The new actor's interactions with others will be affected by and will affect the continuing and future interactions of those around it. A useful analogy here is of the introduction of a new product into a supermarket. The supermarket is not constructed around the new product, nor is there empty shelf-space waiting for it. Other existing

⁴ This section is based on Håkansson and Ford(2002)

products will have to move sideways to accommodate it, although the effect on each one may be small. Some of these existing products may benefit and others may lose because of the entry of the new product. In the same way a new actor's interactions will affect those around it, but those interactions will be built upon the previous experiences of those involved in the interaction and those of the others around it. Each actor brings its own baggage from the past. This phenomenon is familiar from technological studies where path-dependence has been identified as a key issue, but here that path-dependence is within a wider context. Path dependence means that the analysis of interaction must always look behind current patterns of interaction to what has preceded them and framed their evolution.

In the same way, it is difficult to identify the final completion of an interaction. Each interaction will affect subsequent interactions between the participants and others. There are no end-results in business! The problem of predicting future directions is multiplied because the characteristics of each interaction can affect that subsequent interaction in multiple directions.

Another problem in the analysis of interaction is that it is not evenly distributed over time. Interaction is likely to be "lumpy", so that there are periods of more intense *episodes* of interaction than others. It is also difficult to characterize what defines a single episode of interaction or to find a neat way to identify its boundaries or when it starts or finishes. There is likely to be an important element of interdependence over time between single episodes, but these episodes may also be very important to understand as units in themselves. Many of the preoccupations of managers are in trying to manage effectively within a particular episode, whether that episode is defined in the form of a meeting, an order, a delivery or a financial transfer. One way for analysis to cope with "lumpy" interaction is to identify "significant events" or "critical incidents". This approach clearly provides historical information, but has similar boundary problems to those of "episodes". More importantly, the idea of critical incidents may also involve assumptions about the causality of outcomes that are likely to be unwarranted in a situation of complex, multi-party interaction.

The interaction between two actors will evolve over time through experience and learning. But interaction at any one point in time is not pre-determined by what has happened before. Interaction will also be affected by the concerns or problems of the actors as they arise and by influences on them from their parallel interactions or those from elsewhere in the network. However, an interaction episode is not just an island of significance in a sea of ordinariness, if for no other reason than that its significance will be impossible to assess at the time. Most interaction episodes are each relatively insignificant among many others, such as deliveries, payments, communications etc. These episodes may be interrelated in an obvious or in a confusing way, but taken together they comprise the relationship between the participants. A single episode will affect each of those involved in it differently. A single episode is also likely to be interpreted differently by each of them and by others around them.

A series of episodes will in many cases simply be continuous or “normal”, such as a normal flow of orders, normal terms of payment, normal products etc. These episodes are part of everyday life for those involved in them and existing business relationships and routines play an important role in providing a basic structure to business activity. Most interaction episodes are not critical incidents. Many are not significant in themselves at all, although each may include some new element. But these interaction episodes, together with various actors’ interpretations of them, define the life of the individual or corporate actor.

Each single element of newness in an interaction episode simultaneously restricts and expands the opportunities for future interactions for both of the participants in it and for others. In fact each single element of newness may have *multiple* sequential effects in *many* directions. These multiple processes of restriction and expansion produce at least two problems for both actors and analysts:

The first problem is that it is difficult to make sense of the alternative possible outcomes of interaction. Thus, actors may not be aware of how their options may have been broadened or narrowed by some outcomes. Similarly, analysis will show that the multiplicity of simultaneous interactions, both between and outside of any dyad make it effectively impossible to construct distinct causal links between particular episodes and outcomes in interaction.

The second problem for the actor is how to anticipate and cope with the chain of events in interaction. It is difficult for both actors and researchers to understand interaction because things happen in a causal, but unknown sequence. Also, each actor will have a view of a preferred or probable sequence and will interact today with an eye on subsequent interaction in the future. These subjectively preferred or predicted sequences mean that a researcher seeking to explain interaction over time will have to be interested both in the evolving views and pictures of the actors as well as how activities and resources are actually evolving.

We will close this section by relating our treatment of time to four ways in which researchers have conceptualised the problematic characteristics of interaction over time and of the ways that subsequent interaction episodes are related to each other:

1. The easiest way to cope with the issue of time is to ignore any effect between episodes by assuming that each episode or exchange is independent of all other episodes, as is done within transaction-costs economics (Williamson and Ouchi, 1981). On this basis, each interaction episode may be analysed and managed separately. The assumption of independent exchange situations means that the best total result for the actor will appear if each situation in itself is handled in the best way.
2. An alternative approach is to consider that episodes are related together over time in a process of development that comprises a life cycle consisting of a number of different stages.

This approach sees episodes as part of a process of learning, adaptation, commitment and distance-reduction over time. However, this and similar stage models tend to infer that the development of relationships is a rather deterministic, unidirectional and linear process. This does not relate well to the much more complex empirical reality of change, decay or re-development (Ford et al 2003).

3 A third way is to assume that the process of interaction over time has a cumulative effect. One way of doing this is to consider the economics of interaction over time as an investment process. In this interpretation, the companies are considered to be investing in each other through their relationship. One consequence of an investment view of interaction over time is that these experiences and processes must be taken into account when the value of a company is assessed. An investment view also indicates that a company's activities should be steered in ways that develop and capitalize on these investments (Johanson & Wootz 1986)

4 Yet another approach to understanding the process of interaction over time is to take a longer-term historical view.⁵ In this approach, by using contemporary records it is possible to examine the commonalities within interaction that may only become apparent over an extended period.

INTERACTION AND SPACE

⁵ A long-term view has been taken by many other researchers in related areas. Examples include those in the history of technology (i.e Hughes 1983, Lindqvist 1984), history of science (i.e. Galison 1997), science in action (Latour 1987, 1996, Law 1994) and economic history (Rosenberg 1994 and David 1985). Others are those where change, growth or evolution have been central questions such as Nelson & Winter (1982), Pasinetti (1981), Penrose (1959), Nonaka (1991), and Kauffman (1995). A third type is organizational studies dealing, for example, with organizational learning (such as March 1988 and Powell et al 1996).

The existence of substance in the interaction makes space important. The interactive content will make the relative position and orientation of a single interaction process important. All interaction will in this way affect how actors, resources and activities are positioned in relation to each other (Johanson & Mattsson, 1988, Henders 1992). The relative position of an interaction process in space will have consequences in a number of different space dimensions of which its geographical location is just the most obvious. Other aspects include the knowledge activated and produced; the specific resources mobilized and affected and the activities that are performed; the form and intensity of their interaction; and the benefits and costs that each accrues through their interaction. Actors become uniquely related to each other through their interactions and their combined interactions give each a different position in the business landscape relative to others.

A consequence of this relativity in space is that we cannot explain what happens in a single interaction process in isolation from those others with which it is connected. Nor can we realistically describe an interaction process except as relative to the other interactions that may exist in parallel or in sequence with it.

Its connections in space will lead a particular interaction process to become more or less close to some other interaction processes, in at least some of its aspects. For example, the continuing efforts of two companies towards a joint technological development may lead to their increasing interaction with others that can provide support technologies or who may be potential applications for the technology. In this way a company becomes related to actors of which they may know very little. Interaction with a specific counterpart indirectly but systematically relates an actor to a whole set of other actors. Interaction is a way for ideas, solutions and technologies to travel across several actor boundaries. The facilitation of these connections is the classic role of distributors, such as wholesalers and export/import agents and financial intermediaries such as brokers. The interactive business landscape is characterised by a large and increasing number of companies with few but highly specialized internal activities or resources that operate almost solely on the basis of their

ability to access the activities and resources of others. Hence these companies operate on the basis of their ability to interact on behalf of counterparts. This role is illustrated in the earlier presented Figure 3. The position of Actor A between the two others, B and C gives it a special opportunity to act directly as a mediator between two or more adjacent actors that do not interact with each other. This mediating effect may extend to other more distant interactions across the network and is commonly seen in the case of search engines, import houses, trade organisations and financial service providers.

Interaction provides a way for companies to take advantage of an economic world that is characterised by diverse, distant and often unknown but potentially cooperative counterparts. Interaction creates stability in a continuously changing landscape. This stability is necessary in a world that is full of influences that are unknowable by any individual actor. The structure of interaction relates a single company to particular others that in turn are also related to others. In this way, every actor in a network has a specific position and its interactions reflect this. In the short term these positions provide the multiple and relative contexts for interaction. In the long term, continuing interactions successively change these positions and this structure.

Actors employ their resources differently in interaction with different counterparts and develop their interdependencies differently with each of them. The value of an actor's resources is different, depending on the particular relationships in which they are employed. This applies to everything when business is conducted in an interactive context. Thus we cannot analyse a single interaction process in isolation, but only in relation to others that exist in parallel or in sequence with it.

The importance of space for interaction raises the issue of what approach to interaction may be appropriate for an actor in a particular setting. A consequence of the importance of space is that there are no general rules to enable us to determine what interaction is appropriate. What is good in one situation – in one place - may not work in another and what is right for one company given its

place may be wrong for others. But even worse, what is right in the short run may be wrong in the long run and what is perceived in a positive way by one counterpart may later be viewed negatively by the same counterpart.

The ability to analyse and cope with changes in relation to space dimensions becomes a key issue for actors. These changes will involve relative movement between one particular interaction and others. This is part of the critical question for those involved in analysing interaction, “who should a particular actor prioritize in its interactions and who should it not?”

The close connection between space and interaction creates a dynamic *structure* in which an actor is related to particular others who in turn are also related to particular others. In this way, every actor gets through the interaction a specific *position* within the network. In the short term these positions provides the multiple and relative contexts for interaction. In the long term, continuing interactions successively change these positions and this structure. The space dimension has two major effects on the interaction:

The first effect arises from the relative position of the two counterparts and makes that the evolution of an interaction process is not determined by the aims of either of those involved in it. Instead, the evolution of a particular process emerges from a combination of the respective intentions of those in that process and of the positions they have. Hence the directions and contents of connected interaction processes are influencing the development.

The second effect of space arises over time. Interaction may lead a particular company to systematically adapt towards a particular counterpart, i.e. to get closer to it in one or several dimensions. This adaptation is manifested as changes in the company’s resources, activities and relative interdependence. But at the same time, the particular counterpart may be moving toward some other counterpart and that counterpart may also be moving in relation to others

and so on and on. Companies evolve in relation to each other, but it is a case of movements within a moving world!

An interesting paradox of this dramatically dynamic situation is that it may be rooted in the development of rather mundane routines, as follows:

Space and Routines in Interaction

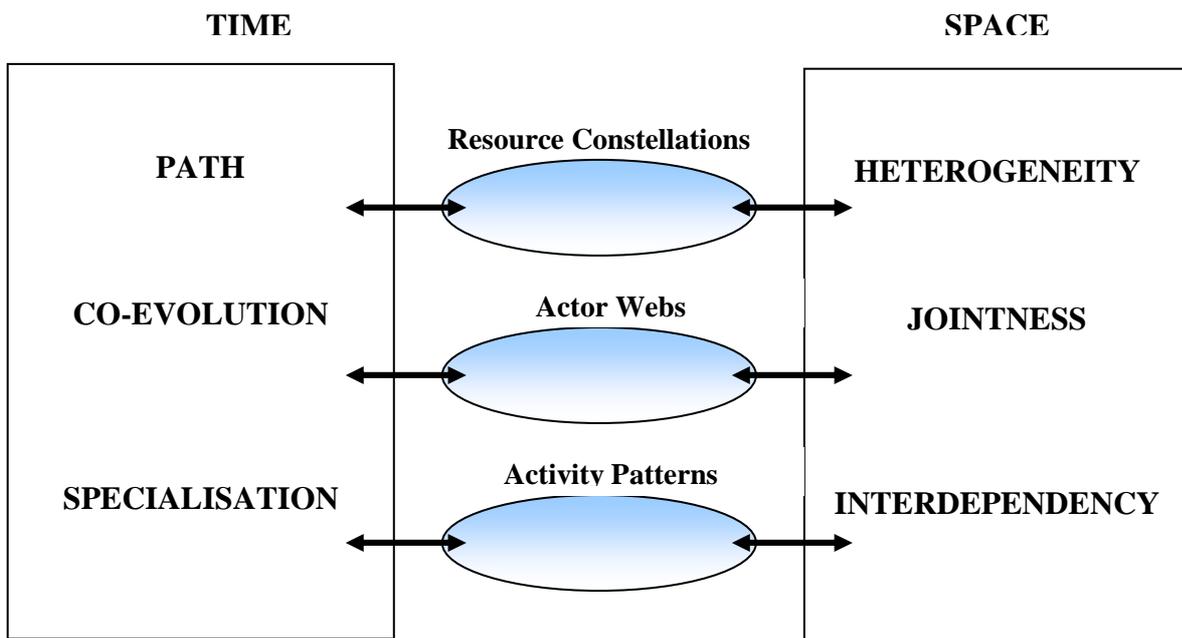
A considerable proportion of an actor's interactions are likely to be more or less routinised within its different continuing relationships, encompassing such things as "normal" deliveries, services, payments etc. This normal interaction may be contrasted with that which consciously or unconsciously changes the characteristics of a particular relationship or the connections between them. Routine interaction may lead to the development of formal or informal rules between specific companies and across the wider network, so that each knows what should be done, or what each can get away with. It is common for the effects of these rules, both formal and informal, legal and illegal, to extend over many participants in a network and to produce a contrast between the relative interactions of "insiders" and "outsiders" (Kriesberg 1955, Palamountain, 1955). Common examples of these rules include professional ethics, trade association rules, contract law and dispute resolution, common terms of trade, market sharing and price fixing.

Routines have an important double effect on interaction. On one hand, routines create predictability and trust between the counterparts and can increase the efficiency of a relationship as they can reduce many of the costs of handling the relationship, such as making deliveries, payments and other day-to-day activities. However routine interaction may also become "institutionalised" so that ways of working are unquestioned and inefficiency and other problems can develop.

A MODEL OF THE INTERACTION PROCESS

We can now continue this conceptualisation in a model that seeks to systematically relate time and space with interaction. The model is shown in Figure 4.

FIGURE 4 A MODEL OF BUSINESS INTERACTION



The Model of Interaction starts by disaggregating interaction into the three layers that form the base for the ARA-model: the activities and resources of each of the counterparts in the relationship and the counterpart actors themselves, each with their associated hopes, expectations for, and approaches to each relationship. The model indicates that each of these layers is involved in the interaction process and each is modified and shaped by it, as follows:

Each layer of each interaction process is inter-related in the space dimension. The form of each actor, activity and resource is defined by its position within the wider webs of actors, patterns of activities and constellations of resources that stretch across the network.

Each layer of each interaction process is inter-related in the time dimension. The form of each actor, activity and resource in the network is defined by the interactions in which they are currently and have previously been involved.

The model shows interaction between actors occurring within and between each layer and in the context of wider activity patterns, resource constellations and actor webs. The model also shows each layer of interaction to be closely related to both time and space. Finally, the model also indicates the nature of the often complex relations between each layer of interaction and time and space to which we now turn:

Interaction, activities and time:

In a continuously changing world, each single activity and the activity patterns of which it forms part evolve over time. The model refers to this evolution as a process of *specialization*. Actors build specialisation into their activities relative to each other and to others as their interaction develops. Interaction constantly relates individual specialization processes to each other. The specialization of activities by actors is an important factor in the development of long-term business relationships and activity patterns. Specialisation involves a willingness by actors to forgo short-term gain for long-term reward and a commitment to a particular counterpart at the expense of others. Actors have to be able to assess and re-assess the costs and benefits of these specialisations as their relationships develop, their interdependence grows and the problems on which they are based evolve. Many specialisations involve significant costs for both actors, but many are critical for the development of particular relationships. But specialisation is neither a simple nor an uncontroversial process: the specialization of a single activity may affect many other activities either positively or negatively across different activity patterns. Specialisation towards one interaction process frequently involves specialization away from another.

The specialization process is closely related to the development of interdependencies between activities in the space dimension as will be further developed below.

Interaction, activities and space:

Activities distributed in many “places” in the space dimension are interdependent: They may be in different geographical locations; they may arise from different problems; be for specific or wide application; be at high or low or involve different types of costs and benefits. Some of these activities may appear to be independent, but they are more likely to be connected to others in a variety of ways. They are more or less interdependent. Interdependence of activities is both a pre-existing structure of interaction and is an outcome of interaction and the development of business relationships. Interdependence both affects and is affected by interaction.

The interdependence of activities is an unavoidable consequence of the distribution of activities across the business landscape. This distribution develops over time in order to gain the benefits of specialisation. These interdependencies are both important and complex and interaction will be strongly influenced by the possibilities and problems that arise from them. But the complexity of interdependencies may mean that actors are not aware of the existence of all of them, nor may they appreciate their implications. Hence a key aspect of business interaction is the building, managing and exploitation of interdependencies.

Dependence on the activities of others is not a negative, but an essential aspect of interaction. Companies can exploit the specialization of activities in a more extensive way through *seeking* and accepting dependence on others. Dependence also enables them to develop and exploit other activities and achieve efficiencies. But interdependencies also increase the commitment of companies to specific counterparts over time as well as the relative importance of their interaction

with them. Companies also seek to build the dependence of others on themselves in order to achieve stability in their interactions over time with consequent gains in efficiencies.

The interdependencies in an actor's existing relationships simultaneously empower and constrain its ability to achieve change and growth (Håkansson and Ford 2002). Thus for a company relying on the activities of others increases its freedom to invest its own resources in more productive areas within that relationship or elsewhere and provide the basis for it to develop in new directions. But at the same time, an actor's dependence in its existing relationships restricts its freedom to act in the directions of its own choice and require it to invest in interaction within its existing relationships.

Interaction, resources and time: The development of a single resource or a combination of resources; physical, human or financial into particular technologies or abilities often follows an identifiable *path* over time. These paths have been observed by a number of studies of technological development that have explored the existence of path-dependency. The development of a resource along a path is closely connected to the interaction which can be observed in the use of that resource and in its combination with others in a resource constellation. This path can often be observed in the use of particular resources in different applications in sequence. For example, the technological resource of electronic control was sequentially applied in different applications such as petrol pumps, taximeters, domestic appliances and vehicle engines by combining it in different resource constellations with other technological as well as physical, financial and human resources.

The development of single or constellations of resources over time, whether depicted as path-dependence, technology-trajectories or life-cycles seems to be based on two basic features of resources: The first is concerned with the resource's potential to be developed, which is always unknown; the second is concerned with how this potential is related to other resources. For both of these reasons, the path followed by a particular resource is difficult to forecast owing to the

multiplicity of problems to which it may be addressed in constellations with other multiple resources accessed by multiple actors. This difficulty is reinforced because the evolving path of a resource may depend on decisions on specialising activities that are difficult to reverse. For example, the decision to commit a resource in a relationship with others will take that resource down the path of a particular constellation that may involve significant investment by the company in development activities. Conversely, a decision not to invest in a particular resource may well be difficult or impossible to reverse at a later time after others have made similar investments. Resource decisions may effectively be once and for all.

Interaction, resources and space: Resources in the business network are *heterogeneous*. This means that the usefulness and value of a single resource depends on the other resources with which it is combined, or in other words, where it is located in network space. Resource heterogeneity means that interaction is a means for value creation across company boundaries. Conversely, a company can increase the value of single heterogeneous resource and of its total resources through interaction. Interaction positions different resources more or less close to each other. Changes in interaction can move the location of resources towards or away from each other along a number of aspects of the space dimension: geographic, problem orientation, technology. Thus interaction effectively “moves” resources relative each other and consequently affects their value and how embedded they are in each other.

Interaction, actors and space: The existence of the space dimension has similar implications for the actor layer as for resources. These implications centre on the differences between actors in their various interactions. Each actor acquires identity through its interactions with the particular counterparts. It cannot exist in isolation, it is always contiguous with some others: which leads to *jointness*. Jointness is a way of characterizing the specific relationship between any two actors in relation to all others. Jointness is a central feature of an economic world where interaction is a key attribute and it has a number of aspects.

Jointness implies that interaction is never simply dyadic. Even if interaction appears to take place between only two parties, the intentions of those parties, the content of their interaction and its outcomes will not be limited just to them. Any actor interacting with a specific counterpart depends on the intentions, resources and activities of all those others with which it also interacts. Thus, any company that supplies another does so by using its own activities and resources. But it also uses the activities and resources of its own suppliers as well as those of the customer. It is also using the activities of its other customers. In this way, all business interaction has an important “joint” content. Thus a business company cannot be adequately described in terms of its own internal activities and resources. A company is probably more accurately described as a “node”, or the point at which the activities and resources of others come together with its own, through its interactions with those others.

Jointness can also take organizational forms such as when actors take part in directed, collective or *joint* interaction with specific others. Examples include joint technological development, joint logistics or the development of joint sales or procurement organizations. Thus we can identify jointness in the design of resources, or in the performance of activities as well as in the holding of similar ideas about the context of interaction. An important effect of jointness is to reduce the importance of an actor’s own intentions in determining the direction of its development and increases the importance of the combined intentions of interacting parties in the development of them all.

The concept of jointness also covers two related aspects that describe the orientation of companies towards each other: Mutuality and reciprocity. *Mutuality* exists when the interacting parties explicitly pursue common aims. Mutuality is a measure of how much a company is prepared to give up its own individual goals in order to improve the relative outcomes of specific others and through this to increase its own ultimate well-being. Hence mutuality is closely related to time and the trade-off that actors have to make between short-term opportunism and longer-term gain. *Reciprocity*,

exists when parties feel obliged to interact on the basis of the previous actions of a counterpart. Reciprocity can involve both positive rewards and negative pay-backs and is closely related to time: Interactions may be based both on assurances of long-term future pay-back and on revenge for grudges from long ago.

The underlying logic of jointness is that the space dimension in interaction makes it both possible and necessary to create joint positive results with others. In the long run any company in an interactive world is dependent on the success of its counterparts. The interaction between two actors is related to interactions with others and it may be influenced, mediated or facilitated by these others. This is seen clearly in the context of a so-called distribution channel or supply-chain. In both of these cases it is the interdependencies and interaction between the actors, rather than the plans or control of any one of them that jointly allow goods and services to flow between them.

The existence of jointness fundamentally questions the meaningfulness of analyzing a single business alone or a single action *in itself*. We cannot separate and isolate any action from the corresponding reactions of counterparts. All are part of the interaction between multiple actors. An actor exists in the context of its network and is defined by its relationships and through its interactions in that network. An actor's interactions effectively determine its characteristics, its capabilities, its scope, its freedoms, its obligations and its restrictions. Each actor and each interaction will depend on and be based on the actor's own resources and those of others who stand with it, behind it and against it.

Interaction, actors and time: Actors evolve in an interactive landscape. Business companies successively change both in terms of the activities they perform, the resources they control and with whom they interact. But the evolution of each single actor is not an individual process, but one that takes place interactively with others. Actors *co-evolve*. Co-evolution means that if an actor seeks to cope with its own problems or opportunities has to do so by coping with those of its counterparts.

Co-evolution does not infer that any two business companies necessarily evolve by becoming closer to each other or that relationships have a deterministic life leading to ever greater mutuality. Instead, co-evolution is a multi-dimensional process that takes place within two or more actors in parallel as each seeks to relate its own problems, resources and activities with those of others. In this way, co-evolution can actually lead actors to become more diverse.

The importance of working together and different suggestions to how it can develop has been discussed in other marketing studies such as Achrol 1991 and Achrol and Kotler 1999, in general network based studies such as Castells 2000, Jarillo 1988, and Freeman 1992, in strategic alliance studies such as Gulati 1998, Gulati et al 2000 and Spekman et al 2000, interorganizational studies (Powell et al 1996) and can also be related to research in political science and game theory such as Axelrod (1984), but also to research based on social network studies (Nohria & Eccles 1991, Podolny 1994).

CONCLUSIONS

The model of business interaction that we have developed in this paper relates the three layers of the interaction process; activities, actors and resources to the two key dimensions of interaction; time and space. Each layer is interactively defined, both in itself and in its connections with the others. Thus each layer can only be understood in terms of the other two, from both an analytical and a managerial perspective. In the same way, the existence of a substantive content gives the interaction important time and space features. The content will always embed both time and space in a number of ways. It also affects the way activities is performed, the way resources are used and combined and also the way actors relate to each other. This way of conceptualizing interaction gives some interesting consequences.

Firstly, it gives an indication of how important interaction is in the total knowledge creation. The ongoing interaction processes and their content will be an important knowledge source for every actor – learning and teaching must be two very vital sub-processes taking place. The two parties will produce something together that has an history as well as some future expectations embedded. Thus, they can benefit from what has happened earlier as this is part of the content as well as learning from the counterpart. The earlier created knowledge as well as the continuous learning in the interaction can together with the own knowledge be incorporated in the design, planning or forecasting of future interaction. Memories can be used as a device for prediction and as a planning tool about the usefulness of specific others. Furthermore, each actor can also bring over experiences from other ongoing interaction processes, which, for example, is especially important when developing technical items.

Secondly, this way of conceptualizing interaction suggests that it plays a key role in the “construction” of value and thereby economy. The interactive substance has a key role in affecting activities and resources and will directly influence their economic outcome. Thus, interaction can be a means for the actors to co-create the physical as well as the economic context. Of course, this development might lead to negative as well as positive outcomes for companies by leading them into uneconomic activities or to unproductive investments.

Thirdly, this way of conceptualizing interaction gives also managers a certain possibility to create stability and thereby also prediction power in certain respects. We may illustrate this by, for example, consider “supply management”.

Through systematic interaction with suppliers a buying firm can successively increase the specialization of performed activities not just between itself and the suppliers but also to other related companies (suppliers to the suppliers, others customers to the suppliers, etc). The interaction can also be used to find new and better ways to combine the resources used by the involved companies.

Interaction can in this way be used to successively decrease costs or increase revenues. The

“managers” can through enhancing and systematically influencing the interaction create positive effects for the own company.

REFERENCES

- Achrol RS, 1991, Evolution of the Marketing Organisation: New Forms for Turbulent Environments, *Journal of Marketing*, Vol 55 (Oct) 77-93.
- Achrol, R.S., Kotler, P., 1999, Marketing in the network economy. *Journal of Marketing*, 63 (Special issue), 146-163
- Axelrod, R.M., 1984, *The Evolution of Cooperation*. New York, Basic Books.
- Biemans, W.G., 1992, *Managing Innovation within Networks*, London, Routledge
- Blankenburg-Holm, D., Eriksson, K., Johanson, J., 1996, Business networks and cooperation in international business relationships. *Journal of International Business Studies*, 27 (5)
- Blois K.J, 1972, Vertical Quasi-Integration, *Journal of Industrial Economics*, Vol 20, no3, 253-272.
- Castells, M., 1996. *The Rise of the Network Society. The Information Age: Economy, Society, and Culture*. Vol. 1. Oxford: Blackwell Publishers.
- Dahlquist, J., 1998, *Knowledge Use in Business Exchange, Acting and Thinking Business actors*, Doctoral thesis no 74, Department of Business Studies, Uppsala University.
- David, P.A., 1985. Clio and the Economics of QWERTY. *The American Economic Review*, Vol. 75, No. 2, pp. 332-337.
- Dubois, A., 1998, *Organising Industrial Activities Across Firm Boundaries*, London, Routledge
- Easton, G., Lundgren, A., 1992 Changes in industrial networks as flow through nodes, in Axelsson, B., Easton, G., (eds) *Industrial Networks – A New View of Reality*, London, Routledge
- Ford D, Håkansson H and Johanson J, 1986, How do Companies Interact? *Industrial Marketing and Purchasing*, Vol 1, No 1, 26-41.
- Ford D, Gadde L-E, Håkansson H and Snehota, I, 2003, *Managing Business Relationships*, 2nd edition, Chichester, John Wiley.
- Freeman, C., 1982. *The Economics of Industrial Innovation*, Cambridge, MIT Press.
- Galison, P., 1997, *Image and Logic: A Material Culture of Microphysics*, Chicago: University of Chicago Press
- Gulati, R., 1998, Alliances and Networks. *Strategic Management Journal*, 19, 293-317
- Gulati, R., Nohria, N., Zaheer, A., 2000, Strategic Networks. *Strategic Management Journal*, 21, 203-215

- Håkansson, H., 1987, *Industrial Technological Development: A Network Approach*. London, Croom Helm
- Håkansson, H., 1989. *Corporate Technological Behaviour. Co-operation and Networks*. London: Routledge
- Håkansson H and Johanson J, 1992, A Model of Industrial Networks, in B Axelsson and G Easton, (eds), *Industrial Networks: A New View of Reality*, London, Routledge, 28-34.
- Håkansson, H., Johanson, J., 2001, *Business Network Learning*, Amsterdam, Pergamon
- Håkansson H and Snehota I, 1995, *Developing Relationships in Business Networks*, London, International Thomson.
- Håkansson H and Ford D, 2002, How Should Companies Interact? *Journal of Business Research*, Vol 55, pp. 133-39
- Håkansson, H., Waluszewski, A., 2002. "Managing Technological Development. IKEA, the environment and technology". London, Routledge,
- Håkansson, H. Waluszewski, A., (eds) 2007. "Knowledge and Innovation in Business and Industry. The importance of using others." London, Routledge, .
- Hallen, L., Johanson, J., Seyed-Mohammed, N., 1991, Interfirm adaptation in business relationships. *Journal of Marketing* 55(2), 29-37
- Henders, B, 1992, Position in Industrial Networks. Marketing Newsprint in the UK, PhD Dissertation, Department of Business Administration, University of Uppsala.
- Holmen, E., 2001, *Notes on a Conceptualisation of Resource-Related Embeddedness of Interorganizational Product Development*. Ph.D-dissertation, Institute for Marketing, University of Southern Denmark
- Hughes, T.P., *Networks of Power: Electrification in Western Society (1880-1930)*. Baltimore, John Hopkins University Press 1983.
- Huemer, L., 1998, *Trust in Business Relations. Economic Logic or Social Interaction*, Umeå, Borea
- Jarillo, C.J., 1988, On Strategic Networks, *Strategic Management Journal*, Vol 9, pp. 31-41.
- Johanson J and Mattsson LG, 1988 Network Position and Strategic Action – An Analytical Framework, Working Paper, University of Uppsala, Department of Business Studies.
- Johanson, J., Wootz, B., 1986, The German approach to Europe, in Turnbull, P.W., Valla, J-P. (eds), *Strategies for International Industrial Marketing*. London, Croom Helm
- Kauffman, S., 1995, *At Home in the Universe*, Oxford, Oxford University Press
- Kriesberg, L. (1955) Occupational Control Among Steel Distributors. *American Journal of Sociology*, 61, 3, 203-212
- Laage-Hellman, J., 1997, *Business Networks in Japan, Supplier-Customer Interaction in Product Development*, London, Routledge

Latour, B. 1984. *Science in Action*. Milton Keynes and Cambridge, Mass.: Open University Press and Harvard University Press

Law, J. (1992) "Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity." *Systems Practice* 5(4): 379-393

Lindqvist, S., 1984. *Technology on Trial. The Introduction of Steam Power Technology Into Sweden, 1715-1736*. Uppsala Studies in History of Science 1. Stockholm: Almqvist & Wiksell International.

Lundgren, A., 1995, *Technological Innovation and Network Evolution*, London, Routledge

Nelson, R.R., Winter, S.G., 1982, *An Evolutionary Theory of Economic Change*. Cambridge, Mass, Belknap Press of the Harvard University Press.

Nonaka, I., 1991, "The knowledge-creating company", *Harvard Business Review*, Vol. 69 No.3, pp.27-38.

Nohira, N., Eccles, R.G., (eds) 1991, *Networks and Organizations: Structure, Form, and Action.*, Boston, Mass., Harvard Business School Press

March, J. G., 1988. *Decisions and Organizations*. Oxford: Blackwell Publishing.

Palamountain, J. (1955) *The Politics of Distribution*, Harvard University Press, Cambridge

Pasinetti, L., 1981, *Structural Change and Economic Growth. A Theoretical Essay on the Dynamics of the Wealth of nations*. Cambridge, Cambridge University Press.

Pedersen, A-C., Torvatn, T., Holen, E., Towards a model for analysing supplier relationships when developing a supply network. *IMP Journal* 2(2), pp 38-58

Penrose, E., 1959. *The Theory of the Growth of the Firm*. Oxford University Press, Oxford

Podolny, J.M., 1994, Market uncertainty and the social character of economic exchange, *Administrative Science Quarterly*, 39, 458-83

Powell, W. W., Koput, K. W., & Smith-Doerr, L., 1996, Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology, *Administrative Science Quarterly*, March 1996, Vol. 41, Issue 1, pp 116-145.

Richardson, GB, 1972, The Organisation of Industry, *Economic Journal*, Vol 82, 883-896.

Rosenberg, N., 1994. *Exploring the Black Box: Technology, Economics, History*. Cambridge: Cambridge University Press.

Torvatn, T., 1996, *Productivity in Industrial Networks – A Case Study of the Purchasing Function*. Ph.D dissertation, Department of Industrial Economics and Technology Management, Norwegian University of Science and Technology

Waluszewski, A., 1989. *Framväxten av en ny massateknik - en utvecklingshistoria. (The development of a new mechanical pulping technique)(dissertation)*. Acta Universitatis Upsaliensis, Studiae Oeconomia Negotiorum, 31. Almqvist & Wiksell, Uppsala

Williamson OE and Ouchi WG, 1981 The Networks and Hierarchies Program of Research: Origins, Implications and Prospects, in van den Ven AH and Joyce, WF (eds), Perspectives on Organisation Design and Behavior, New York, John Wiley.

Wilson, D.T., Jantrania, S., 1994, Understanding the value of a relationship, Asia-Australia Marketing Journal, Vol 2(1), 55-66

Wilk, R. R. *Economics & Cultures. Foundation of Economic Anthropology*. Oxford: Westview Press 1996.

Wilkinson, I.F., Young, L.C., 1994, Business dancing – the nature and role of interfirm relations in business strategy. Asia-Australia Marketing Journal Vol 2(1), 67-79