

**MAKING STRATEGIC DECISIONS IN THE CHANGING NETWORKS  
- OBSERVATIONS FROM THE SCANDINAVIAN FLAT GLASS INDUSTRY**

Work-in Progress paper

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ABSTRACT

**Purpose of the paper and literature addressed:** The paper focuses on the strategic decision making in the situation where the radical technological change is reshaping the network structure dramatically. Especially, the focus is on the situation where the companies are losing their competitiveness and markets as a result of the network evolution (Scandinavian flat glass industry 1960-1980). We contribute to the literature of strategic decision making and sense-making in complex and changing networks which has been discussed lately in the IMP community.

**Research method:** We apply the case study method that is considered as the most suitable method for the business network. Our case study may be described as longitudinal, historical and contextual. The data has been originally collected for a dissertation (Uusitalo, 1995) and further publications (e.g. Uusitalo, 1997a, 1997b). In addition, we employ the event networks to illustrate the critical events that have had an impact on the flat glass industry.

**Research findings:** We found several connected technological, economical and political events that triggered the changes within the industry and had significant impacts on the Scandinavian network dynamics. Like business networks, also event networks are complex. Events often have direct or indirect impact on all actors in the network or even in the other networks. This emphasizes that events, actors and networks in general co-evolve.

It seems that the Scandinavian actors saw themselves rather as production than transaction functions and focused rather on the efficiency than effectiveness. Most of them realized too late that the game was already global. Only few actors recognized the critical events and their impacts on the network structure. On the other hand, although some companies were interested in having licenses for float glass production already in 1959, their network position prevented them to get the license.

**Main contribution:** Based on the consequences reported in this study, we suggest that in complex business networks actors need to see things from several perspectives. In this paper we tested the concept of event networks to capture the change in Scandinavian network. We applied the concept as “ex-post”, but we suggest companies to apply it “today” or even “ex-ante” by making sense of the future consequences of the present events and act accordingly.

**Keywords:** network evolution, event networks, strategy, sense-making

## INTRODUCTION

Understanding business networks and their dynamics has been long-lasting interest of researchers, especially within the Industrial Marketing and Purchasing (IMP) Group. Furthermore, much effort has been invested in helping companies to analyse, manage and change their network positions (e.g. Ford, Gadde, Håkansson & Snehota, 2003). However, networks may still be seen as extremely difficult playing field to operate. While managing and controlling the network, the company itself is equally influenced by the network (see the network paradoxes, Håkansson & Ford 2002).

Recent research focuses on how companies “make sense” in complex networks, thus enabling justified and right decisions (e.g. Ford & Redwood, 2005; Henneberg et al., 2009; Möller, 2009). As Weick (1993) puts it, companies may be good at decision making but still falter because of deficient sense-making. Lundgren (1995) suggest that a company should analyse its position and set appropriate boundaries for the network to be examined for the particular decisions. However, Ford & Redwood (2005) see this problematic “since significant events may take place in distant parts of the network, or in another network, not fully associated with the main or obvious one”. When describing the strategic thinking as ‘seeing’, Mintzberg (1991) suggest looking things from seven perspectives: 1) ahead, 2) behind, 3) above, 4) below, 5) beyond, 6) beside and 7) through. However, it might be unrealistic to expect companies taking bird’s eye view on the network and capturing all essential events that will have an impact on them.

This paper focuses on the strategic decision making in the situation where the radical technological change (float glass) is affecting the whole industry and thus, reshaping the network structure dramatically. Especially we focus on the situation where the companies are losing their competitiveness and their markets as a result of the network evolution. By using the empirical case of Scandinavian flat glass industry during in 1960-1980 (Uusitalo, 1995, 1997a, 1997b), we aim to show how the network position may delimit the insight to the industry evolution as well as the possibilities to act.

The remaining part of the paper is organized in the following way. First, we introduce some theoretical foundations of our study, including the network perspective, strategic decision-making and the sense-making in business networks. Second, we describe the methodology of the study. The methodology is based on a longitudinal, historical and contextual case description applying multiple sources of data. Third, we report our empirical case with three sub-sections: 1) a brief description of the float glass innovation and its main consequences globally in both sub-industries (plate glass and sheet glass) of the flat glass industry (macro-perspective), 2) examination of the Scandinavian flat glass industry as a focal net (micro-perspective) that involves the Swedish, Finnish, Norwegian and Danish markets as well as the tightly connected safety glass and MGU (multi-glass unit) industries, and 3) analysis of few focal actors on the organizational level. In the last and most important sub-section we aim to demonstrate how some of these Scandinavian actors missed or misunderstood the critical events which eventually, or actually quite soon, had an unpreventable impact on their own operation. We aim also to demonstrate how some actors did not have a possibility to act in the desired way. Finally, we draw conclusions and discuss implications and further research.

## LITERATURE

In this study we use the industrial network approach (Johansson & Mattsson, 1994) since this approach suits in our situation well. The paper deals with the Scandinavian networks and according to Araujo and Easton (1996) especially Swedish business systems have played a major role in the development of the industrial network approach.

This section is divided into three sub-sections. The first one deals with the network development which, on the one hand, is developed by the businesses but, on the other hand, have an impact on the businesses. The second sub-section deals with strategic decision-making especially in the complex and changing networks. Finally, we discuss about sense-making in the business networks. As we will see in our case description it might become difficult to capture all signs of the change.

### Developing the network and developed by the network

Sometimes, a company may feel fine. There is no need to any significant changes; on the contrary everything feels secured. In this kind of situation, companies quite naturally want to remain static. This may also be the intent in the networks. However, the actors in the network may think differently. They may develop deliberately their operations towards their goals through the network and following the ARA-model (Actors, Resources, Activities; e.g. Ford et al. 1990, Håkansson & Johansson 1992, Håkansson & Snehota 1995) actors have partial control over each other through interlinked relationships. Thus, the networks are continuously evolving and changing the companies with it (Håkansson & Snehota, 1995; Easton, 1992). On the other hand, one should remember another challenge with developing networks: they may also become an obstacle to the change (Håkansson, 1989).

The network is a product of its history in terms of all memories, investments in relationships, knowledge, routines, etc. Most partners must accept the changes within the network. That is why the changes tend to marginal and closely related to the past. Stability and development are closely linked. Improvements in certain parts of the network need stability in others, and vice versa. Stable relationships can be crucial when one partner tries to change the use of certain resources. Actors in the network can act. Relationships can facilitate mobilization of large parts of the network when great changes are required. The network model suggests mechanisms where stability and change in industrial systems not only co-exist but are actually interdependent. (Håkansson & Johanson, 1992)

To emphasize the importance of the network, Håkansson and Snehota (1995) have described individual company as “a linking unit where its strategic attributes lie in how it connects other market participants to each other”. Thus, the authors remind that the picture of both the possibilities and the means to manage the business enterprise becomes quite different (Håkansson & Snehota, 1995).

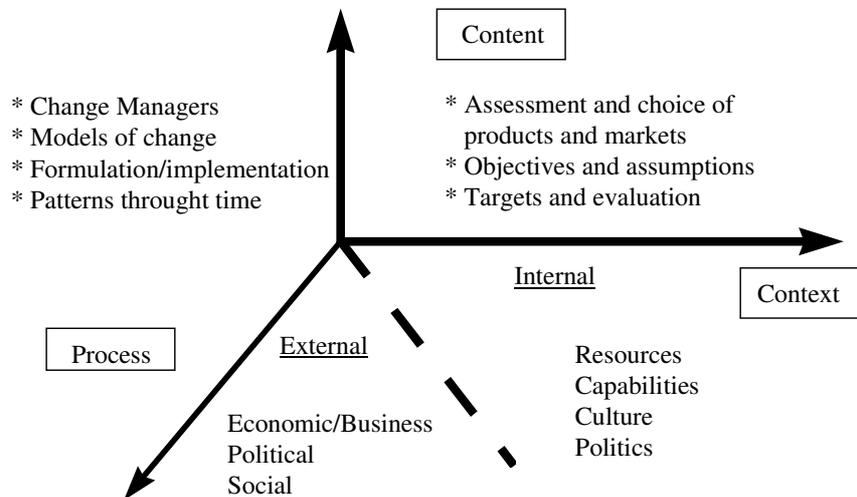
During the last decades, there have been various attempts to describe and analyse networks and company positions at a particular point in time and furthermore, to help companies to manage or change their network positions (e.g. Ford, Gadde, Håkansson & Snehota, 2003). However, operating in networks is difficult. Difficulty is summarized well in three network paradoxes identified by Håkansson and Ford (2002). 1) A company’s relationships are the basis of its operations and development, but they may also tie the company and restrict its ability to change. 2) These relationships are the outcome of the company’s own decisions and

actions, but on the other hand the company is equally the outcome of the relationships. 3) Companies try to manage the relationships and control the network to achieve their own aims, but the more a company achieves this ambition of control, the less effective and innovative the network will be.

### Strategic decision-making in business networks

Håkansson and Snehota (1990) emphasize the interdependence between the companies and the networks by discussing that “no business is an island”. They are concerned that in strategic management business is primarily seen as a production function focusing to operate (internal resources) according to the criterion of efficiency. Instead, companies should be seen as transaction functions and they should shift focus “away from the control of resources towards the integration of resources and away from the management of acting towards the management of reacting.

According to Pettigrew and Whipp (1991) to understand strategic change it is essential to explore three basic concepts and their interconnections through time (see Figure 1). Since industries (defined as networks in this paper) change all the time the competition (or internal and external contexts) is (are) best appreciated in a two dimensional way (Pettigrew & Whipp, 1991). The dimensions are the levels at which competition operates and the element of time. The competitive performance of a firm is therefore based on the recognition that firms compete not merely against one another but at the same time within the sectoral (industrial) and national/international structures and relationships. Pettigrew and Whipp (1991) further state that the sectoral and national conditions in which a firm operates and competes are usually unstable. They also mention that firms have different abilities to perceive those changes and to react to them.



**Figure 1.** Understanding strategic change: three essential dimensions (Pettigrew & Whipp, 1991)

When describing the strategic thinking as ‘seeing’, Mintzberg (1991) suggests looking things from seven perspectives: 1) ahead, 2) behind, 3) above, 4) below, 5) beyond, 6) beside and 7) through. Any good vision has to be rooted in an understanding of the past. Thus, seeing ahead needs always seeing behind. To be able to distinguish “the forest from the trees”, one needs to see things above. Since there seldom are readymade big pictures, one needs to dig up the details and create a picture his or her own. Thus, seeing above must be supported by seeing

below. In addition, according to Mintzberg strategic thinker needs creativity. Since creative thinking is often referred to as lateral thinking, he calls this perspective as seeing beside. To be able to put the creative ideas into context, seeing beyond is needed. Finally, to get the things done, one need to see it through.

### Sense-making in business networks

As mentioned, even if companies were good at decision making, they may still falter badly (Weick, 1993). They may falter because their deficient sense-making. Also in IMP community, more and more research has lately focused on the companies' sense-making in complex networks, thus enabling justified and right decisions.

Business networks are seen as complex, systematic webs of interdependent exchange relationships within which companies have to operate (Henneberg et al., 2009). According to Ritter et al. (2004) the challenge for business managers is to develop a networking ability that enables them to connect their resources to those of other actors. They also noticed that this development may be hindered by the lack of understanding of the construct. Making sense of in these complex networks helps managers to understand their own positions and their available options to change it (Henneberg et al., 2009)

However, making sense may be easier said than done. According to Ford and Redwood (2005) significant events often take place in distant parts of the network, or even in another network, not fully associated with the main or obvious one. They remind that threats to the future of business may come from unexpected locations and refer to Christensen's (1997) description that a new technology offering may outflank a company apparently inferior benefits into a separate, although linked, sector of network. Low and Johnston (2009) emphasize that understanding the impact of the technology (existing, emerging, converging) on the existing network structure and network position is critical.

The notions above highlights the current position of the company. The networks can be seen also as communication systems and thus, in well structured networks all the actors should know what is happening (e.g. Håkansson & Snehota 1995). However, as we will see later, even in small networks, such as the Scandinavian flat glass network, it might be difficult to capture the right signals.

## METHODOLOGY

In our study we have used the case study method (Yin, 1989), that is considered as the most suitable method for the business network (Halinen & Törnroos, 2005). The case study captures both contextual factors and process elements in the same real-life connection which make the method strong when studying change processes.

Our case study may be described as longitudinal, historical and contextual. We use multiple case study method and multiple data sources (such as industry and company histories, business, trade and academic journals plus interviews with the industry experts) in this study. The data has been originally collected for a dissertation (Uusitalo, 1995) and further publications (e.g. Uusitalo, 1997a, 1997b)

Hedaa & Törnroos (2008) suggest connected events (event networks) as a theoretical foundation for the study of time and processes in business relationships. Noting that the network perspective to marketing implies that networks are stable as well as changing, the authors believe that the change processes are triggered by forces internal or external to the focal

net. We employ the event networks to illustrate the critical events that have had an impact on the flat glass industry worldwide. We build our event network analysis on our longitudinal, historical and contextual case study which is in line with Hedaa & Törnroos' (2008) regulations.

## THE CASE OF THE SCANDINAVIAN FLAT GLASS INDUSTRY

Float glass innovation substituted the existing grinding and polishing processes in the plate glass industry as well as the drawing methods in the sheet glass industry in the 1960's and 1970's, respectively, and thus became dominant design in both industries. As the consequences of this radical and competence-destroying technological change, two abovementioned industries converged gradually and became more concentrated (Uusitalo, 1995). Instead of two industries, regional or even local markets and small companies, such as the Scandinavian actors, the flat glass industry practically became a global playground dominated by a couple of multinational companies.

We will deal with the case of the Scandinavian glass industry with three sections. The first and the second sections will concentrate on the evolutions of the global and the Scandinavian flat glass industry, respectively. The third section describes the strategic decisions of the selected actors as well as the reasons and consequences of those decisions.

### The global flat glass industry

In this sub-section we describe briefly the float glass innovation and its main consequences in both plate glass and sheet glass industries globally. We do this, since we see these events as inseparable background for the following events in Scandinavia. The description involves also some background of two European giants, Pilkington and St. Gobain, which have played seminal roles in the evolution of the Scandinavian flat glass network. In a sense, the section provides a macro-perspective for the network evolution.

As mentioned, still as late as 1970 some actors considered the flat glass industry as two separate industries rather than as one. Sheet glass was thin, cheap and it had optical distortion while plate glass was thick, expensive and free of optical distortion. The production line of plate glass was noisy and it provided a lot of dirty grinding powder. The float glass innovation had its origins from both industries. The research and development process in Pilkington, that time a UK based family owned company, took seven years and during the process the company made a strategic decision to position float glass as a readymade product in the plate glass industry and not too quickly in between two industries (Uusitalo, 1995; Uusitalo & Mikkola, 2010). In the 1960s Pilkington developed the float glass technology, so that it was able to compete with the technology also in the window glass industry.

Scandinavia was considered as a peripheral area for a long time. Thus, it took some time before the first import of float glass took place. Float glass was introduced to the plate glass industry already in 1959, but only after Pilkington had acquired Sunex in 1968, a Swedish safety glass producer, the first shipments arrived to Scandinavia. The introduction to the sheet glass industry took place in 1970 and by 1973 the float glass had market share of 10% in the Scandinavian sheet glass industry.

In addition to the introduction(s) of the float glass, there are several events worth to mention. For instance, St. Gobain tried to challenge Pilkington's technology by introducing their newly developed twin polishing technology to the plate glass industry in 1962 (Pilkington had

introduced twin grinding in 1935). However, the company soon realised that the technology was obsolescent compared to float glass. Soon after St Gobain withdrew the US markets and concentrated on the European operations. In the sheet glass industry PPG (US) built new plants during the years 1967-68. The plants were based on the new Vertidraw sheet glass drawing technology of which quality was said to be equal to that of float glass. Although float glass was already invading the sheet glass industry, in February 1973 PPG said that sheet glass was one of their base product lines in the flat glass industry. In 1971 also Asahi Glass Co. (Asahi), a Japanese company and one of the largest sheet glass manufacturers in the world, announced that it had developed a new vertical drawing process that retains the advantages of Fourcault, while realizing the advantages of the Pittsburgh process. However, neither of these technologies was able to challenge the float glass technology which was improved incrementally all the time.

Another events worth to mention are the abandonment of tariffs in 1967 between the EFTA countries and the strong competition between the big companies worldwide. In Europe, after the elimination competition, only three major players had survived: Pilkington, St. Gobain and BSN. The most significant events in the industry are illustrated in the event network (Appendix 2). One may notice that these events quite often have triggered the event chains that have affected also on the development of the Scandinavian flat glass industry.

### The Scandinavian flat glass industry

In this sub-section we examine the Scandinavian flat glass industry as a focal net, thus offering a micro-perspective for the network evolution. We describe how this peripheral market was influenced by the technological and structural changes within the industry and how the regional Scandinavian network was merged with the global network. The analysis takes into account the safety glass and MGU (multi-glass unit) industries that use the flat glass as their raw material and are thus tightly connected to the flat glass manufacturing as value-adding industries.

By 1960 there were seven independent sheet glass producers: Emmaboda and Oxelösund (SWE), Korsör (DEN), Drammen (NOR) and, Lahti, Riihimäki and Valke (FIN). All had started sheet glass manufacturing with so-called Fourcault technology in the 1920's or 1930's. Actually most of the companies had been founded after the last technological discontinuity when drawing methods has substituted the blowing method. Only Drammen, Emmaboda and Riihimäki had applied blowing methods. In addition to the seven above-mentioned producers, there were several other actors involved with the industry. For instance, in the MGU business in the 1960's new materials and easily available flat glass attracted new entrants. As one may notice in the Appendix 1, also the safety glass industry supplying windows to the growing Swedish car industry was growing quickly in the 1970's. In addition, there were the Scandinavian network included wholesalers from different countries.

In general, in the 1960's Scandinavian flat glass industry was characterized by slow growth dependence on the building sector and cost increases in labour and in raw materials. National operators served local markets. Most of the producers invested heavily in drawing machines (using the technology developed by the US based PPG) and in new plants. Since the Scandinavian countries were considered peripheral, the companies felt quite secured and they were able to act the way they wanted. For instance, Lahti refused to sell its glass directly to Lasitukku, a company owned by Finnish glaziers. Instead, it sold the glass to the wholesaler that delivered the glass to the glaziers. Thus, Lasitukku was already looking for the opportunity to co-operate with some global actor.

In the 1970's the Scandinavian flat glass network changed dramatically. The network structure is illustrated in Appendix 1. As one may notice, during the relatively short period three main observations can be made in the network level. First, the industry became international, or actually it became global. The Scandinavian actors started to co-operate (joint ventures, agreements) to survive in the elimination competition that was now arriving to the peripheral areas. Second, related to the first observation, the major players built their own networks in the Scandinavia. Already in the end of the 1970's they dominated and controlled the production of the Scandinavian flat glass. Third, as mentioned already in the last sub-section, the growth of the MGU and safety glass industries was remarkable.

The simultaneous changes in the network structure and technology made the industry complex and thus, difficult to make sense. In the following sub-section, the strategic actions of the companies are discussed.

### Strategic actions of the Scandinavian actors

The last sub-section analyzes focal actors on the organizational level, but still as a part of the network. The analysis demonstrates how some Scandinavian actors missed or misunderstood the critical events which eventually, or actually quite soon, had an unpreventable impact on their own operation.

Since our analysis includes seven Scandinavian companies (and some other actors) we have summarized the strategic action in Table 1 and in Appendix 2. Table 1 enlists the most significant strategic decisions of the seven Scandinavian flat glass actors. In the last column the final strategic decision during our time period is bolded. Appendix 2 illustrates the event network that may be considered as the basis of the development of the Scandinavian network.

Especially a look at the event network demonstrates that Scandinavian actors made their strategic decisions by following the events in the local or regional network. If the event network is divided into separate event chains it seems that most events derive from the events and changes in the global network. Nevertheless, Scandinavian actors considered their business as regional or even local. Some weak signals would have been available but they were totally ignored by the Scandinavian actors. For instance, while Scandinavian companies were enthusiastically investing in sheet glass technologies, Libbey-Owens-Ford Glass (US) was already closing its sheet glass plants due to financial losses. When the EFTA countries removed the tariffs in 1967, the actors did not predict the possible consequences and the becoming oversupply of the flat glass. By 1970 the strong German flat glass industry was sold to two French companies, St. Gobain and BSN.

Based on the analysis in the event networks, it seems that the companies are subjected to wrong signals which may mislead them. For instance, Riihimäki decided to invest in modernizing its old Fourcault machines in 1974. The company had long and quite profitable history, the cartel agreement with Lahti, Sitra's (the Finnish Innovation Fund) optimistic report of the Finnish flat glass industry and Asahi's promises of competitive technology. However, history did not matter, the cartel agreement became irrelevant in global network, Sitra's report was too flattering and Asahi's technology was obsolescent. Riihimäki had to terminate its production in 1975. Moreover, most of the Scandinavian actors invested in PPG's sheet glass technology, since PPG had promised that the quality would be equal to that of float glass. The promise felt trustworthy, since PPG itself was extensively using this technology.

All in all, we may notice that making sense seems to be possible since Bror Wahlroos, the permanent undersecretary of the Ministry of Trade and Industry in Finland, was able to see the future development of the glass industry. Partially thanks to his actions, the Finnish flat glass and safety glass industries were able to keep on going as a part of the global glass manufacturing network. He was able to do that since he was looking things differently, from another perspective.

*Table 1. Companies' strategic decisions in the Scandinavian flat glass industry 1960-80*

Company	Business	Technology	Relationships and strategic decisions
<b>Lahti</b> (FIN, 1922)	Sheet glass  MGU sub-licensed from Öxelösund (Gränges) in 1965	Fourcalt  1969 PPG	<ul style="list-style-type: none"> <li>- MGU sub-licence from Oxelösund (Gränges)</li> <li>- Member of Finnglas</li> <li>- 1969 Cartel agreement with Riihimäki → concentrates on MGU</li> <li>- 1969 PPG (4 machines)</li> <li>- 1973 PPG (2 machines)</li> <li>- 1974 Acquires Autolasi (MGU, safety glass)</li> <li>- 1976 Agreement with Pilkington to terminate the sheet glass production</li> <li>- <b>1978 Sold (50%) to Pilkington</b></li> </ul>
<b>Riihimäki</b> (FIN, 1910)	Sheet glass	Fourcalt  (1974 Asahi)	<ul style="list-style-type: none"> <li>- Member of Finnglas</li> <li>- 1969 Cartel agreement with Lahti → concentrates on safety glass</li> <li>- 1974 Modernizing existing machines (Asahi)</li> <li>- <b>1975 Ceases and soon after terminates production</b></li> </ul>
<b>Valke</b> (FIN, 1940) Owned by United Paper Mills (UPM)	Sheet glass	Fourcalt	<ul style="list-style-type: none"> <li>- Member of Finnglas</li> <li>- <b>1972 Left the industry</b></li> </ul>
<b>Emmaboda</b> (SWE, 1919) Since 1945 partly owned by St. Gobain	Sheet glass  MGU (JV with Korsör and Drammen)	Fourcalt,  1959 PPG	<ul style="list-style-type: none"> <li>- 1959 Tries for getting float glass licence without success</li> <li>- 1959 PPG technology</li> <li>- 1968 50% more capacity (PPG)</li> <li>- 1973 Scandifloat negotiations</li> <li>- <b>1974 Sold to St. Gobain</b></li> <li>- 1976 Merger (Emmaboda, Drammen, Scanglas, Gränges and St. Gobain with majority)</li> </ul>
<b>Oxelösund</b> (SWE, 1927) a division of conglomerate company <b>Gränges</b>	Sheet glass  MGU technology from the US	Fourcalt,  1969 PPG	<ul style="list-style-type: none"> <li>- 1969 Joint venture (Scanglas) with Korsör (or Danish companies), PPG (6 machines)</li> <li>- <b>1976 Merger (Emmaboda, Drammen, Scanglas, Gränges and St. Gobain with majority)</b></li> </ul>
<b>Korsör</b> (DEN, 1937) owned by the Danish companies from other industries	Sheet glass  MGU (JV with Drammen and Emmaboda)	Fourcalt  1969 PPG	<ul style="list-style-type: none"> <li>- 1959 Tries for getting float glass licence without success</li> <li>- 1969 Joint venture (Scanglas) with Gränges</li> <li>- 1973 Scandifloat negotiations</li> <li>- <b>1975 Forced to sell Scanglas' holdings to Gränges</b></li> </ul>
<b>Drammen</b> (NOR, 1883) Since 1963 partly owned by St. Gobain	Sheet glass  MGU (JV with Korsör and Emmaboda)	Fourcalt  1965 PPG	<ul style="list-style-type: none"> <li>- 1959 Tries for getting float glass licence without success</li> <li>- 1965 PPG (2 machines)</li> <li>- <b>1976 Merger (Emmaboda, Drammen, Scanglas, Gränges and St. Gobain with majority)</b></li> </ul>

## CONCLUSIONS

Dosi et al. (1988) suggests that a single company does not have a full control over the evolution and exploitation of a new technology. In the end, this was also the case with the float glass, but we may conclude that only few actors did understand the possible paths of the industry. On the other hand, because of the central role some actors participated on several key events and thus, “steered” the direction of the whole network development.

In our analysis we found several connected technological, economical and political events that triggered the changes within the industry and had significant impacts on the Scandinavian network dynamics. Like the business network, also the event networks are complex. The events often have direct or indirect impact on all actors in the network or even in the other networks. This emphasizes that events, actors and networks in general co-evolve.

It seems that the Scandinavian actors saw themselves rather production functions than as transaction functions (Håkansson and Snehota, 1990). Thus, they focused on the efficiency rather than effectiveness. Companies did not realize that the game was already becoming regional if not even global. It seems that only few actors did recognize the critical events as well as their impacts on the industry structure and were familiar with the old idiom “if you can’t beat them, join them”. On the other hand, even that some companies were interested in having licenses for float glass production already in 1959, their network position prevented them to get the license. Pilkington had made clear that it would license the technology in the plate glass industry at that time. Interesting question is: why these conscious companies forgot to try the license again in the 1970’s after Pilkington had changed its policy?

### Managerial implications

In complex business networks it seems that the actors have to be able to see things from different perspectives. In our case most companies were making sense just by following the events and changes in the closest network. Instead, we suggest that looking things and especially the network development from the seven perspectives suggested by Mintzberg (1991) help actors to understand the extent of the business network and the impact of time and processes on their own business. This could help the companies to avoid the ‘Marketing Myopia’ (Levitt, 1960). The Scandinavian actors should have realized that they are operating in regionalizing or even globalizing flat glass industry, not anymore in sheltered, national sheet glass industries.

In this paper we have tested the concept of event networks proposed by Hedaa and Törnroos (2008). We agree with them that event networks are effective as a theoretical foundation for the study of time and processes in business. In addition, it seems that event networks could be used as a sense-making tool to capture the relevant causalities of the network development. We applied the concept as “ex-post”, but companies may apply it “today” or even “ex-ante” by imagining the future consequences of the present events and act accordingly (Hedaa & Törnroos, 2008).

### Further research

Some actors, succeeded with the events better than most. Thus, to develop our study further we are going to examine the factors that would explain the differences among the companies. Based on this paper, the similarities of the unsuccessful companies seem to be focusing on

efficient production rather than effectiveness and considering Scandinavia as isolated and peripheral area. However, other factors and reasons undoubtedly exist. For instance, Lahti's relationships with other actors, such as Finnish government, due to its geopolitical importance may have played vital role when finding solution to survive in the late 1970's. Especially interesting would be to examine the how the companies analysed their operational environment (and to what extent). In addition, the main approach to competition may have been different. While most of the companies though market shares important, others focused on the technology as the base of competition.

As was mentioned most of the Scandinavian flat glass manufacturers started their business in the 1920s or 1930s as newcomers to the industry by using the newly developed sheet glass draw technology. In the 1970s the same companies were dramatically and harshly taken over by a new technology, float glass. This brings us the ever lasting notion: Is history repeating itself or can we learn from history. We also have identified another case where we can see history as a teacher. In 1930s Pilkington bought safety glass companies in the Commonwealth Countries and the Central Europe to guarantee its plate glass sales. The German sheet glass competed that time heavily with plate glass (Barker, 1977). As we saw in the 1960s and 1970 Pilkington bought again safety glass companies for instance in Scandinavia to guarantee its float glass sales. Float glass had to compete with high quality sheet glass, plate glass and imported float glass from North America. The study of "what we can learn from history" would be interesting.

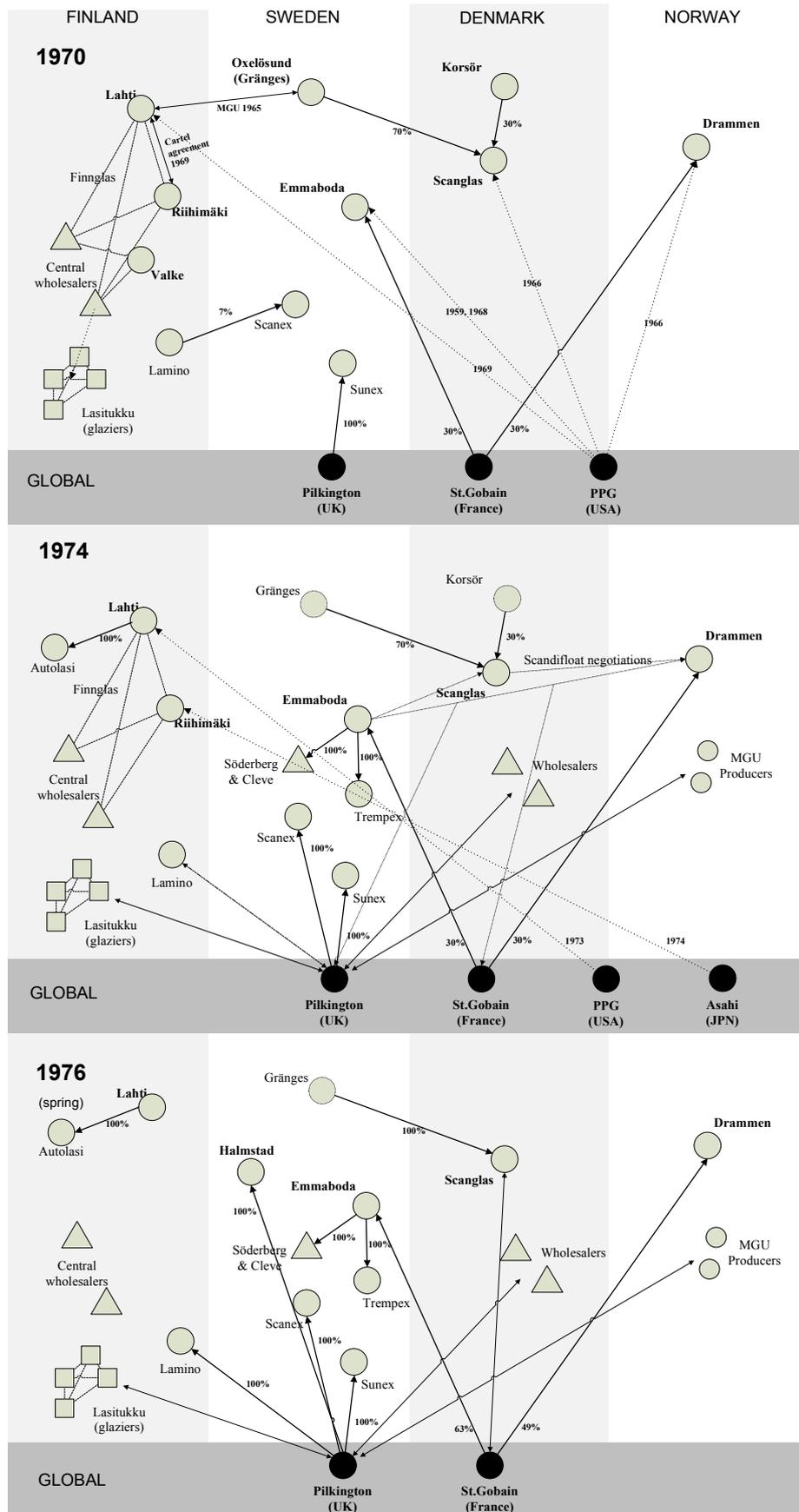
It also seems that Bror Wahlroos played key role keep the national glass manufacturing (including safety glass) going as a part of the global network. Thus, it would be interesting to find out, how a state official was able to construct a better picture of the network development than some managers in the companies.

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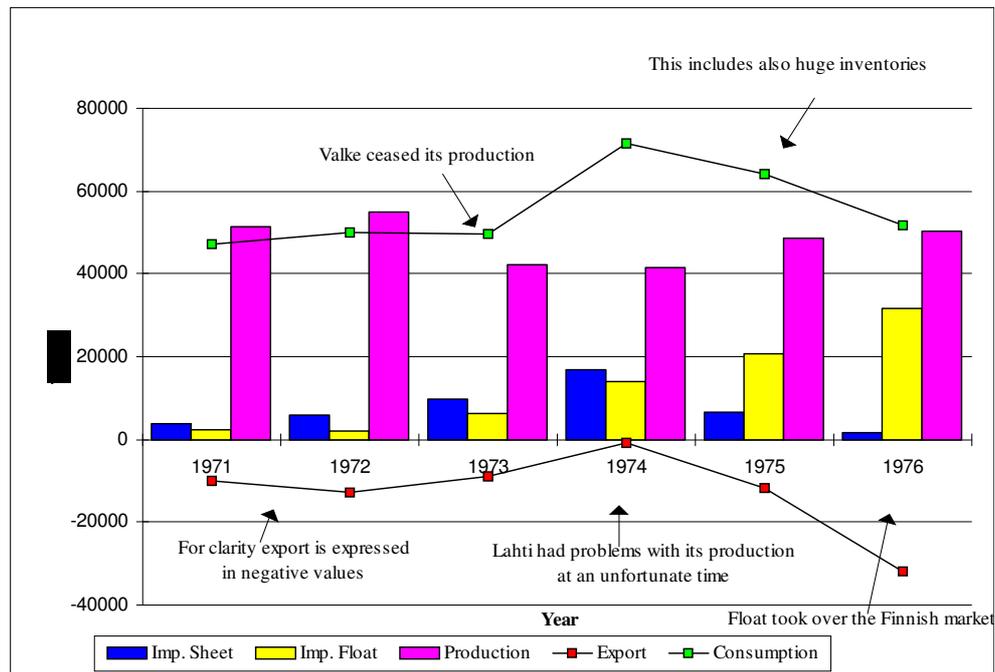
# Appendix 1 Network development in the Scandinavian Flat Glass Industry 1970-76





### Appendix 3

#### Glass Import, Production, Demand & Export in Finland, 1971-1976



(adapted from Uusitalo, 1995)

#### Float Glass Imports by Country or Area in 1970-78 to Scandinavia (1000 tons)

Year	United Kingdom	West Germ.	Belgium	France	North America	Total of these
1970	3	1	3	1	0	8
1971	6	1	5	0	0	12
1972	7	1	6	0	1	15
1973	13	1	9	0	4	27
1974	29	2	12	1	6	50
1975	52	5	14	3	9	84
1976	57	12	18	5	14	106
1977	5	15	13	1	13	47
1978	6	21	16	2	5	50

(adapted from Uusitalo & Luostarinen, 1996)