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## Regional networking as success factor in the transformation processes of maritime industry: Experiences and perspectives from Baltic Sea countries

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Fakultät für Wirtschaftswissenschaften  
Wismar Business School

Gunnar Prause (Ed.)

Regional Networking as Success Factor in the  
Transformation Processes of Maritime Industry  
Experiences and Perspectives from Baltic Sea  
Countries

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## **Gunnar Prause**

### **Preface**

The maritime industry in Mecklenburg-Vorpommern is in the middle of a turbulent period since the start of the financial and economic crisis in 2008. Whereas the field of maritime logistics started to recover from the beginning of 2010 the maritime industry is still facing times of low business activities. Nevertheless, maritime industry is still representing the industrial backbone of Mecklenburg-Vorpommern, usually being responsible for approximately 20 % of the regional industrial turnover, more than 350 maritime companies and approximately 12 % of all industrial work places, representing more than 13,000 jobs.

In order to discuss future development perspectives of maritime industry in Mecklenburg-Vorpommern, the 4<sup>th</sup> regional conference “Maritime Economy in Mecklenburg-Vorpommern” on 1. – 2. December 2010 will offer a forum for representatives from economy, science and politics. Due to the ongoing structural changes in maritime industry, new concepts and perspectives are necessary. The conference discussions will be enriched by presentations from experts from Finland, Norway and Sweden giving their experiences on regional networks as success factors in transformation processes in maritime industry.

This book consists of four papers concentrating on the situation of the shipbuilding sector in Finland, Norway, Sweden and Germany. In contrast to the presentations and discussions during the conference the papers will give a broader view on background information as well as business environment and development than it would be possible in a short conference contribution only. All countries had and have their own traditions and experiences in maritime industry but also all of them took their own ways in developing and transforming the classical shipbuilding sector towards a new perspective. In all four cases regional development and networking aspects played an important role for the elaboration of new concepts.

After having read all four papers it will be obvious how important the regional networking approach is for successful transformation processes and which lessons can be learned for the restructuring of maritime industry. One important message is that the future of European shipbuilding is only possible in the field of maritime high-tech products where the lessons learned from initiatives in all four countries are revealing important experiences of constraints for successful networking structures.

Tallinn, November 2010

Gunnar Prause

**Ari Koski\***

## **Network Oriented Services in the Case of the Maritime Cluster in South-Western Finland**

### **Abstract**

Today's economy faces the complex and simultaneous process of globalisation and localisation. Although globalisation poses serious challenges for the traditional spatial units of policy-making, it has become clear, that place continues to matter. Due to globalisation, the local characteristics have become crucial which has strengthened the localisation trend of market activities. A spatial unit that seems to gain importance in the knowledge economy is a region (Kaskinen et. al. 2006). The regional environment of social capital has become as relevant as the national macro economic situation in determining the ability of enterprises to compete in the global economy (Goddard 2000). Due to the development, the interest has been focused on different kinds of regional innovation systems (Autio 1998; Cooke et al. 2000; Doloreux 2002). Probably one of the most important single reasons has been the success story of the cluster approach.

Shipbuilding has long traditions in South-Western Finland. The on-going roots of an industrial shipbuilding in Turku reach the year 1737, and tradition in Rauma goes back until the 1500's. Nowadays, the entire maritime cluster is particularly well represented in the region, where we find companies representing all of the business areas within the cluster.

The maritime cluster in South-Western Finland represents the modern cluster in the purist sense in good and recently in bad. The most important part of the cluster, the STX shipyard is extremely specialised producing the largest and most luxurious cruisers in the world mainly for one customer and for one market area. The network of some 750 companies and their 14,000 employees have been tuned up to produce the top quality cruisers and they have expertise to do so. Each company in the network has its own role and the management of projects has improved ship by ship. Higher education institutions as well as the other educational institutions in Turku and elsewhere in Finland have been utilized in continuing education, R&D and innovation. One can't underline enough the importance of the shipyard and the cluster for the economy of the Turku region, South-Western Finland but also for the whole country.

Due to the severe recession during past 2-3 years the entire cluster is about to collapse if the new business opportunities can't be found quickly. There is no hope or expectations on the jackpots like Allure of the Seas within coming years in Turku. However, authorities and cluster companies in Turku believe that Turku will build ships and cruisers also in the future. It will be the main

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focus. The promising projects relate to the arctic areas and offshore markets and to the future markets like Brazil, Russia and Asia. The cluster builds its future on the highly specialized skills and competences e.g. in green technology solutions. The luxury hunts favoured by the billionaires have been mentioned as one opportunity. There can be as many as 5-6 lids and length of these vessels can exceed a hundred metres. The expected markets for these hunts are of the same size with passenger ships. The most important objective of the development measures is to keep the cluster alive and the key companies vital. This is how the disappearance of advanced know-how would like to be prevented. It is again needed when the next boost emerges.

### **Thematic framework**

#### *Place continues to matter*

Terms like rapid change, networking, globalisation, localisation and knowledge intensity have been used to characterize the contemporary world. The future success will come to those enterprises that can meet the global standard, join global networks and create operational models that apply to quickly changing market trends. The competitiveness of the enterprise depends on skilful employees and innovative products or services. On the other hand, the well-being of municipalities and regions depends on vital enterprises (Goddard 1997). The regional availability of knowledge and skills and ability to develop technological capabilities has become as important as the physical infrastructure. The regional environment of social capital has become as relevant as the national macro economic situation in determining the ability of enterprises to compete in the global economy. Accordingly, universities are expected more than ever to actively engage in the development of their regions. A regionally engaged university has become a key asset and powerhouse for regional economic development and the establishment of regional innovation structures (Etzkowitz et al., 2000; Goddard 2000).

Due to the above-mentioned development, the interest has been focused on different kinds of regional innovation systems (Autio 1998; Cooke et al. 2000; Doloreux 2002). Probably one of the most important single reasons has been the success story of the cluster approach. Michael Porter (1998) argues that today when companies can source capital, goods, information and technology from around the world very easily, much of the conventional wisdom about how companies compete needs to be overhauled. In theory, more open global markets and faster transportation and communication should diminish the role of location in competition. Anything that can be effectively sourced from a distant place through global markets and corporate networks is available to any company and therefore is essentially nullified as a source of competitive advantage. However, location remains fundamental to competition, states Porter. Its role is just different than a generation ago.

In an era when competition was driven heavily by input costs, locations

with some important endowment – natural harbour or supply of cheap labour – often enjoyed comparative advantage that was both competitively decisive and persistent over time (Porter 1998). Competition today is far more dynamic. Companies can mitigate many input cost disadvantages through global sourcing. Today, competitive advantages rest on making more productive use of inputs, which requires continual innovation. According to Porter, this means that immediate business environment outside the company plays as vital a role as functions inside the company. Thus, the enduring competitive advantages in a global economy lie increasingly in local things – knowledge, relationships and motivations – that rivals cannot match. This role of locations has been overlooked, despite striking evidence that innovation and competitive success in so many fields are geographically concentrated. Porter has summed up his statement in an idea of a cluster: critical masses of unusual competitive success in the particular field in one place. These clusters attract more new companies, suppliers and customers than a single company could alone and that's why they have to be considered when any company makes site selection decisions. The cluster approach goes along with the concept of economies of agglomeration. The concept describes the benefits that companies obtain when locating near each other. As more companies in related industries cluster together, costs of production may decline significantly because companies have competing suppliers, greater specialization and division of labour.

Thus, today's economy faces the complex and simultaneous process of globalisation and localisation. Although globalisation poses serious challenges for the traditional spatial units of policy-making, it has become clear, that place continues to matter. Due to globalisation, the local characteristics have become crucial which has strengthened the localisation trend of market activities. A spatial unit that seems to gain importance in the knowledge economy is a region (Kaskinen et. al. 2006).

The importance of the region and regional innovation system underlines the role of regional interdependencies. The concepts like triple helix and learning region or economy have been utilized to explain the current processes. The theory of triple helix connects the traditional categories of the innovation economy with institutional and evolutionary economics, joining three main institutional sectors – public, private and academics (Tödtling & Trippl, 2005). The statement is that in a knowledge-based society the boundaries between public and private sector, science and technology, university and industry are increasingly fading, giving rise to a system of overlapping interactions, which did not previously exist (Ughetto, 2007). Florida (1995) argues that regions must be defined by the same criteria and elements which comprise a knowledge-intensive firm: continuous improvement, new ideas, knowledge creation and organisational learning. Regions must adopt the principles of knowledge creation and continuous learning. In other words, they must become learning regions. In his statement on learning economy Bengt-Åke Lundvall (Goddard



2000) argues that learning economy is characterised by the following features:

- the success of individuals and firms reflects the capacity to learn (and forget old practices);
- change is rapid and old skills get obsolete and new skills are in demand;
- learning includes skills and the building of competencies, not just increased access to information;
- learning is on-going in all parts of society, not just high-tech sectors;
- net job creation is in knowledge intensive sectors.

*Interaction as the basis for learning and innovation*

One of the significant features in all approaches of regional development during the past 20 years has been the increasing awareness on the universities' role in regional clusters and innovation systems. As the OECD (2007) has pointed out, universities through their research, teaching and community engagement can be the key actors fostering and supporting regional innovation. Universities can take a leading role in innovation, complementing and not just supporting the business. While for decades universities have been seen as structures for providing trained personal and generating knowledge, the contemporary university is an amalgam of teaching, research, entrepreneurial and scholastic interests providing qualified graduates and researchers, but also offering innovative solutions through technology transfer mechanisms which enhance links with the local industry system. As a result, and as a consequence of the conjectural financial situation, governments are rethinking how to maximise the benefits from higher education in order to use them as principal agents for regional development and assist economic recovery. Within this triangle, universities are the knowledge source, industry puts into practice this knowledge through technology transfer mechanisms, and governments provide resources to facilitate the interaction between all the agents of innovation systems and policies (Etzkowitz et al. 2000).

By any means and in one form or another, regions are presently trying to attain some form of triple helix partnerships, clusters and learning economies. The common objective is to build an innovative environment by generating alternative strategies for economic growth and social transformation such as university spin-offs, tri-lateral initiatives for knowledge based economic development and strategic alliances among the parties. However successful regional cooperation is reliant on the ability of all the key organizational players - universities, government/public authorities and business – to establish strong and feasible partnerships (Vilalta 2010). How well the dynamic dialogue functions between the producers of information, and on the other hand, the distributors and users of information, defines how much of this potentiality of regional competitiveness will be realized for the benefit of the enterprises (Godard & Chatterton 1999). We can talk about a regional innovation system or a learning region when the regional community, formed by the producers, dis-

tributors and users of information, begins to participate widely in the strengthening of expertise and in the creation of innovations. This is when the community develops such resources, which makes it distinguishable from other regions (Kostiainen 1999; Lemola 2004).

Regional development is an innovation process, which crucially depends on interaction. Interaction is the basis for learning and innovation and hence eventually for the economic prosperity of regions. As Pirjo Ståhle and Markku Sotarauta (2003) state, innovation is not a technical process even if it results in new technology. People create innovations and achieve results, and that is why innovating is mainly a human and a social process. When considering a potential of a region or company for competitiveness, from whichever viewpoint, the cooperation and the networking between right people become the focal point. From the perspective of an enterprise, this means firstly gaining information about the top level experts relevant to their area of business, and secondly, creating confidential and strong relationships with them. Thus, one of the central aims of a regional innovation system and focus of the regional authorities should be to create possibilities for business and experts from different fields to meet, and to promote the interaction between knowledge producers, disseminators and users. The operational environments, which channel and enrich the flows of information and enable fluent communication, and thereby also make the information accessible and processable are more than crucial for the business and regional development in the globalised economy.

More than 20 years ago, Martin and Irvine (1989) pointed out that five premises should be taken into account when successful partnerships are looked for:

1. communication (bring together disparate groups in an arena to discuss and interact),
2. concentration on the long term (think forward),
3. coordination (through networks and partnerships),
4. consensus (attainment of a common vision) and
5. commitment (desire to implement the common vision in the light of a common output).

## **The maritime cluster of South-Western Finland**

### *The cluster in a nutshell<sup>1</sup>*

Shipbuilding has long traditions in South-Western Finland. The on-going roots of an industrial shipbuilding in Turku reach the year 1737, and tradition

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<sup>1</sup> The chapter is based on the data of the 2 surveys conducted by the Centre for Maritime Studies in the University of Turku. Karvonen et. al. (2006), Meri yhdistää osaamisen. Lounaisen Suomen meriklusterin perusselvitys. Merenkulkualan koulutus- ja tutkimuskeskus, Turun yliopisto, Paino-Kaarina. Karvonen, T. & Holma, E. (2009), Lounais-Suomen meriklusteri 2009. Publications from the Centre for Maritime Studies, University of Turku, B171.

in Rauma goes back until the 1500's. The maritime cluster is a functional entity comprised of many different industries and businesses. It includes e.g. navigation fields, maritime industries, and port operations in the private and public sectors. The sea plays the unifying role for all of these businesses and operations. The maritime cluster businesses and industries are particularly significant for the Counties of Southwest Finland and Satakunta in South-Western Finland.

The shipbuilding industry, shipping and port operations form the core of the maritime cluster. Around these are a large number of sub-contractors, suppliers, partners, associated businesses, various professionals and academic training and research facilities, public administration, unions and associations. The combination of all these contributors forms a solid maritime cluster. The maritime cluster includes e.g. shipyards, ship equipment manufacturers, marine suppliers, ship design offices and offshore industries, shipping companies handling both passengers and goods, traffic, ship supply and clearance companies, classification societies, ports, companies specialising in port technology, port operators, and other service providers related to sea transport. Examples of significant associated businesses include financing and insurance companies.

The entire maritime cluster is particularly well represented in the region of South-Western Finland, where we find companies representing all of the business areas within the cluster. The maritime cluster holds great relative significance for the regional economy and industries in South-Western Finland. Only the maritime cluster in the Åland islands has greater importance. In the Counties of Southwest Finland and Satakunta, the maritime cluster includes approximately 400 companies with a total of almost 500 operational sites and offices. The numbers differ a little depending on the ways of calculation. Some estimations show that the total number of companies linked in the cluster is 750.

In 2008, the combined turnover of the maritime cluster companies in Southwest Finland and Satakunta totalled approximately 4 billion euro. Of this amount, about 3.5 billion euro came directly from the maritime sector, which signifies any company activities related to navigation, maritime industries and port operations. The direct economic impact and multiplier effects of the maritime cluster extend in a significant fashion to the economy of the entire region.

In the Counties of Southwest Finland and Satakunta, the maritime cluster provided work for approximately 17,100 people in 2008, of which 12,700 were directly employed in the maritime sector. Of this number, nearly 8,800 people are employed in the maritime industries. In addition, the public sector involved in the maritime cluster employs approximately 1,000 people. The maritime cluster employs approximately 6 % of the entire employed population in Southwest Finland and Satakunta. The indirect employment impacts are conservatively estimated to be no less than 1.5-fold and extend to numer-

ous fields of business located throughout the region. When the numbers of direct and indirect jobs supported by the maritime cluster are combined, the total for Southwest Finland and Satakunta can be more than 27,000 people, or approximately 8.5 % of the employed population in the region.

Of the entire Finnish maritime cluster, the combined share for Southwest Finland and Satakunta is roughly estimated for one third, but the share fluctuates greatly in the different fields of business within the cluster. The region holds the largest relative significance to the shipbuilding industry, as nearly 90 % of the shipyard jobs in Finland are located in this region. This region also handles about one fourth of the country's shipyard operations. During 2005, nearly 24 % of all the marine traffic between Finland and foreign countries was handled by the ports in South-Western Finland. The combined turnover for the public ports of the region represented 25 % of the entire turnover of the all public ports of Finland.

The maritime cluster and, in particular, the shipbuilding and mechanical engineering industries and navigation have far-reaching historical traditions in South-Western Finland, and this is viewed as an important strength for the cluster. The advantages offered by tradition are further boosted by an ever-expanding, broad and comprehensive network of sub-contractors and suppliers, high-standard and highly multi-professional maritime expertise and the proximity of the region to the sea. The region also offers diverse training opportunities for maritime-related fields and the supply of labour is quite good. However, the demand for professionally skilled employees exceeds the supply in many of the business areas of the maritime cluster, as is the case in the shipbuilding industry in particular. According to the cluster companies, the region's most important competitive advantages, compared with other regions in Finland, are its location, the competence of its employees, technological expertise and a functional network of subcontractors.

The one cornerstone of the cluster is the significance of B-to-B cooperation. Companies operating in different fields benefit from mutual interaction and the network of expertise is a central factor of the cluster. In Southwest Finland and Satakunta, co-operation and networks have been exploited well and are viewed as a necessary area for development. In addition to business activities (including ports), there is a significant number of public sector organisations and similar actors in South-Western Finland. Many public sector organisations are working in close co-operation with the maritime cluster either directly or indirectly. All of these parties are joined by the single objective to improve the operational models and environment of the companies within the maritime cluster. Active participants in the region include the Finnish Maritime Administration, Customs, the Finnish State Pilotage Enterprise, the Border Guard, the Finnish Navy, the Centre for Economic Development, Transport and the Environment, Finnvera, and the Finnish Seamen's Service MEPA. Unions, associations (e.g. the Finnish Lifeboat Society) and other organisations,

such as the Finnish Seamen's Mission, also play an active role in the regional activities.

Training and educational organisations have their own significant place in the maritime cluster and in securing its future. The region provides a solid foundation for the businesses operating within the maritime cluster by offering training and further education opportunities at vocational schools, secondary education institutes, the universities of applied sciences and universities. The region is also strongly engaged in research and development activities.

### *The recession of the maritime industry*

The maritime cluster in South-Western Finland represents the modern cluster in the purest sense in good and recently in bad. The most important part of the cluster, the STX shipyard is extremely specialised, producing the largest and most luxurious cruisers in the world mainly for one customer and for one market area. The network of some 750 companies and their 14,000 employees have been tuned up to produce the top quality cruisers and they have expertise to do so. Each company in the network has its own role and the management of projects has improved ship by ship. Higher education institutions as well as the other educational institutions in Turku and elsewhere in Finland have been utilized in continuing education, R&D and innovation. One can't underline enough the importance of the shipyard and the cluster for the economy of the Turku region, South-Western Finland but also for the whole country.

The maritime cluster in South-Western Finland has developed along the global growth of the cruise industry. The cruise industry has been one of the fastest growing segments worldwide within travel and leisure industry (Finpro 2009). The number of passengers has kept an average annual growth rate of 7 % since 1980's. The industry has been expected to keep the steady growth also in coming years. However, everything halted in 2009 along the deepening of the global economic recession.

Global economic recession influenced the maritime cluster in South-Western Finland too. The growth numbers in turnover and employees of the cluster companies turned down in 2008 and the curve deepened in 2009. The number of the new orders decreased 30 – 40 % in 2009. The situation of course varies company by company depending on company's field and duties. Those who are involved in planning and design lost the job already in 2009 when the companies of interior decoration are fully booked also in 2010.

The latest milestone was inscribed in October 2010 when the Allure of the Seas, again the largest cruiser in the world, departed from the Turku harbour. It reminds us of the reverse side of the global economy and possible setbacks of the extremely specialised cluster approach. After the departure of the Allure of the Seas, the STX shipyard is a silent place. After the years of rapid growth and steady flow of new orders, the order portfolio of the shipyard was empty. Although there are some negotiations and some new minor jobs all work

places in the shipyard and the vitality of the sub-contractors can't be guaranteed. The shipyard will be empty at least the year 2011 during the planning and design of the new ships. For the cluster itself the situation is extremely challenging. If the shipyard can't offer job opportunities, the sub-contracting companies have to look for new businesses elsewhere. This means that Turku loses the versatile, specialized and competent network that the building of the world's most luxurious and largest cruisers demand. Re-establishing the network can be difficult and at least takes time that is not a commodity within a business labelled by extreme competition (Lindqvist 2010).

For the economy of the Turku region and whole South-Western Finland the situation is more than challenging. Although the sub-contractors have spread around the country the majority locates in the region. According to the worst scenarios, the unemployment rate in Turku can rise up to 15 %. The problematic scenario can be explained partly by the fact that during the years of growth nearly all cluster companies had to increase violently and recruit all possible professionals from near and far to survive with the new orders. Today, companies have to give an employee notices due to the lack of work. Direct and indirect economic impacts on the development of the region are significant. Indeed, the highly developed networking has doubled the challenges. Along the growth of the out-sourcing percentage the number of companies dependent on the shipyard has risen. The share of the out-sourced build-up on the total value of shipbuilding has increased ship by ship. The share was 38% in 2006 when the Freedom of the Seas was handed over, 52% with the Liberty of the Seas and even 75% with the Oasis of the Seas in 2009 (Lindqvist 2010).

The regional Compass working group appointed to save the maritime cluster and representing local, regional and national public authorities and business and education sectors has estimated that the 1/3 of the cluster companies is in good shape as the companies have other cornerstones and business operations beside maritime industry. These companies have been also active in starting new projects and scanning new markets. 1/3 of the companies has severe challenges and will probably give up if there won't be new orders soon. Those companies have been almost totally dependent on the shipyard and have been maybe sub-contractors of the sub-contractors. One field in this basket is interior decoration. For them it is, however, relatively easy to find other business opportunities from the mainland. The last 1/3 of the companies consists of companies that are in comparatively good shape but that need public subsidies and finance to survive during the worst years. These companies have promising new projects and potential new core businesses (Lindqvist 2010).

#### *The next steps of the cluster*

There is no hope or expectations on the jackpots like the Allure of the Seas within coming years in Turku. Turku has delivered five cruisers during the last five years for the same market. It is clear that the Royal Caribbean Line and

the other possible shipping companies look at 3-4 years before they will do new orders. However, authorities and cluster companies in Turku believe that Turku shipyard will build ships and cruisers also in the future. It will be the main focus. The promising projects relate to the arctic areas and offshore markets and to the future markets like Brazil, Russia and Asia. The cluster builds its future on the highly specialized skills and competences e.g. in green technology solutions. The luxury hunts favoured by the billionaires have been mentioned as one opportunity. There can be as many as 5-6 lids and length of these vessels can exceed a hundred metres. The expected markets for these hunts are of the same size as passenger ships. The most important objective of the development measures is to keep the cluster alive and the key companies vital. This is how the disappearance of advanced know-how would like to be prevented. It is again needed when the next boost emerges (Lindqvist 2010; Karvonen & Holma 2009; Suomen Kuvalehti 2010).

No matter in subsidy policy or new innovations in the maritime sector, many companies have to look for totally new business opportunities. Then the attention should be on their really high-level competences in issues like project management and 3D imaging. The question is how these competences could be utilized in other fields of business.

Based on the survey conducted in 2009 (Karvonen & Holma), the following future opportunities can be identified.

- Internationalisation. The level of internationalisation of SMEs in maritime industry is relatively low although the business itself is really global. However, the latest recession roused also SMEs and the majority of the companies is interested in international operations, networking as well as customer relationships. Markets in Russia and elsewhere in Asia, the Far East, Brazil, and Germany from Europe have been mentioned. In practice, internationalisation is still challenging. It is a new approach and operational environment, it is not included in the strategic processes and even the language causes problems. The economic risks of course lift the threshold.
- Further specialisation. Companies believe that the future of the European shipbuilding will be based on highly specialised ships demanded by advanced competences. The whole cluster, from the main shipyard to every sub-contractor and service provider, has to up-date and develops its processes, cost-efficiency and know-how. Offshore markets and new kinds of ship models are mentioned as promising approaches. Companies also believe that tightened regulations and standards e.g. in energy-efficiency, discharge limits and the used fuel of the new ships bring business. Finnish companies are quite competent in these areas.
- New business. The majority of companies that want to stay alive need to find new business opportunities and customers from the mainland beyond the maritime industry. The cruiser industry employed vast amounts of SMEs specialised in interior decoration. New approaches in the maritime

sector don't offer so many opportunities for them. However, it is quite easy for these companies to find business also from the mainland projects. The variety and number of customers should of course be bigger.

## Conclusion

The maritime cluster of South-Western Finland has produced one of the greatest cruisers in the world. The cluster and the shipyard have concentrated on the large and luxury cruisers. It has been a strategic decision taken already before the latest Korean owner, and clearly a successful one. Afterwards, it is easy to say that maybe the decision was wrong in the end, especially because the shipyard became heavily dependent on one customer, Royal Caribbean Line, and on the one market. Many shipyards abroad have more versatile profiles and thus are in a better position.

However, the strategic decision made in Turku followed the rules of the cluster approach as well as the facts on competitive advantages in the global economy. A region has to specialize and a region has to find its characteristic profile that distinguishes it from the other regions. Based on these decisions the region has to establish the regional innovation system and regional networks with triple helix consortium aiming to fulfil the joint vision. This has to be the guideline to pursue in South-Western Finland in the future as well. However, it will be reasonable to base the future on some relatively large cornerstones of the cluster instead of only one, no matter how big it would be.

When we estimate the correctness of the taken decisions, we have to remember that the European and global shipbuilding industry is quite sick (Lindqvist 2010). Without the public support and subsidies, these vessels would be built neither in Finland nor in Europe. As part of the regional partnerships and innovation networks it is of course the duty of political and regional authorities to support regional industry as much as possible. Still, there should be clearer global regulations. The amount of money and the strength of political decisions can influence in the game. Location and local strengths and characteristics that rivals cannot match continue to matter in global economy, but money seems to be the number three.

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**Lars Malmberg\***

## **Regional Networking as Success Factor in the Convention Process of Maritime Industry – the Swedish Experience**

Paper presented at the conference in Rostock the 2<sup>nd</sup> of December 2010.

### **1. Swedish industry**

Swedish industry has its roots due to the forests and the iron ore.

The steel industry was and still is an active part of the Swedish imagination even if its importance now is only a fraction of what it was. But it was an important factor in the development of the shipbuilding industry and vice versa shipbuilding stimulated the development of the modern steel mills in Borlänge, Luleå and Oxelösund which all produced steel for the shipyards and car factories.

Another close development sector were the steel mills specializing for drills like Sandviken, Atlas Copco and Seco Tools, steel for ball bearings, SKF, and even smaller factories like Ramnäs building cables for the shipyards and later oil-platforms and AGA welding-sets.

Forest industries were also both state and private. State owned Assi-Domän is a big owner of forests and industries while the private ones have been merged together in Sweden as a first step and then very often with Finnish partners like Stora-Enso.

Another important path has been the innovations that were made in the 19<sup>th</sup> and early 20<sup>th</sup> centuries like SKF (ball-bearings), Alfa Laval (separators) and Electrolux (white goods).

A fourth sector was stimulated in the national emphasis in the 1950s using the state companies as important buyers of new technology to stimulate R&D in partnership like Televerket (Swedish Telecoms) and Ericsson (mobile telephone systems), Vattenfall and ASEA (today ABB) (high voltage transmission) and university hospitals with medical R&D and Astra (today Astra Seneca), Pharmacia and the former state company KABI.

In Sweden, as in many other countries, military procurements are also used in a way of stimulating high technology development like SAAB for military planes, Volvo Aero for aircraft engines, Bofors for guns and dynamite (AKZO-Nobel), Hägglunds for armoured vehicles (today owned by BAE) and Kockums for boats and submarines. Other shipyards had also had their share in the first part of the 20<sup>th</sup> century.

The Swedish industry was very successful in bringing up multinational firms (MNF) and together with Switzerland still in the 1990s had a larger amount of companies in the top 500 than most countries in relation to the size of the population.

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\* CEO Kalmar R&D Foundation.

A new wave started in the 1990s when IT deregulations were set and new companies started like Tele2, Europolitan and a number of small operators but it also opened up for international companies like the merger between Swedish Telecoms and Sonera in Finland (Telia Sonera) and Telenor.

The state supported/subsidized the buying of personal computers in the 1980s, the building of broadband in the 1990s and Sweden was for some years leading in using IT products like computers and internet. The IT-bubble crashed in the beginning of 2001 and since then the development has been more modest and other countries like Korea have passed Sweden in broadband subscriptions. Sweden is still one of top ten in these fields.

After the second world-war two new global companies have started in Sweden with a new and different approach like IKEA and HM in the trade sector and one, Tetrapak, following the historical trend using an innovation. The Swedish banking system has also been able to survive due to early adoption of the IT-systems. The banking system has been able to increase its international efforts after the banking crisis in the early 1990s and it looks like it is managing to survive the latest financial crisis as well.

## **2. Swedish shipbuilding industry**

### *1840-1940*

As in Germany and other European countries the shipbuilding industries started in the middle of the 19<sup>th</sup> century. First will be given a brief description of the start and what happened up to the beginning of the 1940s.

Motala shipyard at the lake Vättern was the first to produce a modern ship, actually the post-boat made for the route Ystad to Greifswald in 1840.

In Gothenburg, two shipyards started within a few years 1841, 1844 and was followed by a third in 1873, and the one in Malmö started in 1870 (a small remark, the big Swedish construction company Skanska was started 1871 by the same owner).

The real growth came in the 1930s when the Swedish ship building industries became more productive than their competitors from UK and Germany. A figure mentioned is that the Swedes were 3-4 times better than the British. But it was also a period of expansion in the international trade where Swedish, Danish and Norwegian companies were successful in exporting their goods and also to build up companies for transporting it.

In 1933, after the financial crisis, Sweden was the biggest producer in the world of commercial tonnage and kept a position among the three biggest producing countries up to the 1960s.

### *1945 and onwards*

After the world war Kockums was the biggest producer of commercial tonnage and later Uddevalla shipyard in 1957 was number 3 in the world. Uddevalla was created by a private person, the legendary Gustaf Thordén, who ac-

tually bought a shipyard 1947 from the US (Kayser Wharf in Providence). This is worth reminding us when we are worried over that the Chinese are moving over industrial buildings from Sweden or Germany today.

Another important step was taken in Gothenburg 1963 when the shipyards started to move out their new production from the inner city building to a completely new wharf in Arendal. That was the first one where the ships were built totally under roof. The time for delivery was halved.

But the problems occurred quickly. The Japanese industry recovered very rapidly after the war and was successful with a new export-driven economy steered by MITI, the department for Industry and Trade. MITI introduced new strategic goals like Japanese export products should be transported on ships built in Japan. MITI came up with a solution that included state subsidies, loans up to 80 % of the investment and with 8 years of lifetime.

The Japanese salaries were at the time only 40 % of the Swedish ones and the new industries were also built very competitive. This caused a Swedish debate over the coming years about state subsidiaries or not. Sweden had at the time a company, Statsföretag (State Companies), which aim was to take care of major industrial sectors with problems and the Shipbuilding industry would very soon be of highest interest because of the great importance for some regions.

Götaverken/Eriksberg was still number 7 in the world 1964 thanks to the new Arendal shipyard but the first six were all Japanese.

Svenska Varv (State Shipbuilding Company) was founded in 1977, the first shipyard acquired was Öresundsvarvet in Landskrona, later in 1979 also Kockums, Götaverken and Uddevalla, all the big ones (plus some smaller ones like Finnboda in Stockholm).

The last ship launched in Lindholmen was in 1970, Eriksberg in 1979 and Götaverken 1982 (containership Nihon). Götaverken then had an intermediate period with oil-platforms 1982-85 and finally made a new attempt with ships where the last one was the ice-breaker Oden 1989.

The shipyard in Uddevalla launched its last boat in 1986.

The big shipyard in Malmö, Kockums, launched its last civilian boat 1987 but had managed to achieve a huge order of submarines 1987 from Australia that kept it going for another ten years.

In 1987, a new state group was founded, called Celsius, where a number of companies with a military significance were merged including Kockums and Öresundsvarvet.

### **3. State interventions**

The discussions in Sweden were politically very intense in the 1970s on the coming solutions. In the end this was manifested in the creation of "Svenska Varv" in 1977 but then the new government was split on this view. "Is it a good strategy or not to put more money in the sector or leave it to the Japanese

and use the money to change the structure of the hit regions instead”.

Some of the shipyards were so big that in some places like Landskrona and Uddevalla they had a major impact on the small labour markets in those small towns and even Malmö a somewhat bigger town was strongly affected. Malmö was at the time an industrial town and was slowly changing to something new.

The Swedish bank-crisis in 1991-1994 including a lot of turmoil on the Swedish currency also caused a loss of a lot of industrial jobs all over Sweden but of course industrial towns were most severely hit.

In the 1980s the Swedish car industry, however small, was seen as a high-tech industry and the future for Sweden. It was also strong in some areas, especially in Gothenburg wider region. In the year 1985, during the parliamentary election campaign, the problems had grown so big at Uddevalla shipyard that the government persuaded Volvo to locate its expansion plant aimed for Kalmar with 40,000 cars to Uddevalla instead.

At the same time the city of Malmö was promised a new SAAB factory that was planned and an industrial hall was actually built on the shipyard premises.

However, the car industry in Sweden soon got their own problems and the car factories in Uddevalla and Kalmar were closed in 1993 and 1994 respectively and the SAAB factory in Malmö never produced any cars.

The Kalmar factory was, when it closed, also announced as the most efficient factory in the world together with a Lexus factory in Japan. But it was seen as too small and so was Uddevalla when Volvo concentrated its production to Gothenburg and Gent in Belgium. The CEO at the time, Sören Gyll, had as his major idea that a plant needs to produce at least 200,000 cars per year to be efficient.

But tough as it was, that was only the start for the car industry, and the measures taken were not enough. The Swedish cars were sold out in the late 1990s to Ford (Volvo) and GM (SAAB).

And this year, 2010, Ford sold Volvo to the Chinese Company Geely and GM sold SAAB to the Dutch company Spyker (with Russian capital).

#### **4. Kalmar**

The shipyard in Kalmar was never a big one, 400 employees at the shipyards and 200 at the subcontractors, but the history of that small wharf island will be used in more detail to show some interesting features in the total change of the island.

The Shipyard Island (Varvsholmen ), as it is still called today, was from the beginning a tiny island used by the Swedish navy in the 17<sup>th</sup> century until the military shipyard was moved to Karlskrona. The size of the island increased continuously as the shipyard demanded new docks and other facilities.

When the shipyard first went bankrupt in 1980, KIFAB, the industrial real estate company of the city, bought the island to help the company to make a new start. The new shipyard, Kalmar Fartygsreparationer, specialized in main-

tenance and repair which was a very common strategy for many Swedish new starters but also used among the bigger shipyards trying to find a second or third pillar.

Kalmar shipyard also built some smaller, specialized boats. It worked out well in the beginning and the company bought back the island from the city. However in 1987 the last boat left the island and there was a dead lock.

The Mayor of the city at the time could not accept to see the island as a housing area but only as an industrial one. A building company, CA Bygg, then bought the island.

CA Bygg presented plans for building 800-1000 flats on the island and introduced the concept to the new Mayor of the city in 1990. The idea was approved in general terms but the city had some remarks on the high density.

The bank crisis in Sweden 1991-1994 also hit the building sector very severely. A number of subsidiaries to the sector were taken away in the state budgets. That meant that in Kalmar (like in many other cities in Sweden) only flats for elderly people and students were built in the 1990s.

CA Bygg went bankrupt and there was a dead lock up to 1995 when the bank, SE-banken, that now "owned" the island approached the city and asked if Kalmar would like to buy it.

The Mayor at the time thought that this would be an interesting idea but he also had to consider the fact that CA Fastigheter (parent company of CA Bygg) was still involved. After negotiations between the parties in summer 1995 both sides came up with a solution that Kalmar bought the island and made an agreement with CA Fastigheter that the company would have options up to 40 % of the island. These options were described in detail.

This started an interesting co-operation between the city and the private company that has worked out well for ten years now. The last negotiation took part just before summer 2010 and opened up for further construction work that will go on for another five years.

The idea from the beginning was to create, not only a new housing area, but a mix between businesses and housing, more like an old fashioned city block. The City arranged an

Architect's competition for the island where the public was involved and the result was a small scale, rather cosy environment.

But things went in another direction.

The first step in this new direction was the building of an office for the company Intenna. Intenna, making antennas for mobile phones, already existed on the island in one of the old buildings, and had started to grow. A remark is that some of the remaining industrial buildings were used for new companies and one industrial building was even removed to another industrial area in the city.

Intenna also wanted to build a factory on the island but the city opposed the plans and the question finally solved itself as the factory was placed in Nan-

jing, China. The company had started a joint venture with Panda Industries. This was the first actual contact between Kalmar and China. Intenna was later bought by Flextronics and moved to other premises on the island. The Finnish-Swedish consultancy group Tieto became the new tenant.

The second office building was built for Europolitan, one of the new telecom companies, starting a call-centre (Europolitan is now owned by Telenor). Kalmar had been trying to get that company to the city three years earlier but this time Kalmar had the possibility to offer a better location than its competitors.

The third building was a joint effort by moving the Science Park (started in 1994) to new premises in “Kalmar Science Park” together with ten other companies including Intenna.

The university, the City and Kalmar Region in co-operation had managed to attract the Swedish Pharmacy (Apoteket AB) to build their second advanced call-centre in Sweden.

The ultimate reason why they chose Kalmar was the new and very good Pharmaceutical university education in Kalmar and the possibility to set up a new co-operation with the university in e-Health and the new and very good premises.

Parallel to this CA and Kalmarhem (the City owned housing company) started to build a housing complex on the south side of the island with co-operative apartments and flats for tenants.

Later on, this has been followed up by more apartments and single houses. In the final plan there is still room for another office-building as an extension of the science park and the last negotiations also opened up for elderly housing and small shops.

The offices are owned by KIFAB, some housing by Kalmarhem and some by CA but most of the new ones are co-operatives or owned by private persons.

It may seem as a long time from 1987 to 2015 to achieve this change but on the other hand it has also offered good possibilities to rethink over time and to meet new demands as the market changes for new trends. But the big lines on the map formed in 2000 are the same today.

It is interesting to look at the public debate. In 1990 the total building permit asked for by CA Bygg was 45,000 square metres which was then opposed by the City as too much. In the architectural competition the goal was lowered to 25,000. When all buildings will be on place around 2015 the new number of square-meters will be close to 100,000.

The beautiful view on the sound Kalmarsund and the island Öland, the close location to the city centre has made this a very popular area and in spite of high prices have made it an interesting place for a number of people moving to Kalmar.

Some landmarks of the shipyard have been saved like two smaller cranes,

the slipway and buildings around it. The small office building will also be left. The cranes look small today compared to the new land-mark, a multi-storey house called the “lipstick” and there is still a possibility to build an even higher building if someone would find it interesting.

A final word must be said on the financing of this project. In the Swedish exploitation law the city can always ask the private companies to take the costs of the exploitation according to a detailed plan, costs like water, sewage, roads and parks in the blocks. But the so called over- all costs like the road to the block, major investments in the technical systems and some other general costs, in this case securing the sea-bank, are normally financed by taxes.

The agreement between the City and CA Fastigheter was that these costs should be shared by the private company and the City in proportion to the built-up areas. This however meant that the City would need to allocate some 4 million Euros in the budget.

This problem was solved in 1999 by a business agreement between an energy company Gräninge AB (later bought by EON) and the City where Gräninge AB bought half of Kalmar Energy. One part of the money was used to support R&D at the University College which had at the time been acknowledged to do scientific work in Natural Sciences, (the right to educate its own doctorates), one part was saved for pension schemes and one part was allocated to the development of the island Varvsholmen.

## **5. Uddevalla**

The shipyard closed in 1986 which has been mentioned earlier. This major shipyard with a central location in the coastal city got its first new establishment with the new Volvo car plant in 1986 built for a capacity of 40,000 cars. The plant, however, was short-lived as it was closed in 1993.

When the formal decision was taken by Volvo in Gothenburg a hard fight arose between Uddevalla and Kalmar, firstly, in regard to which plant was to be closed last as both thought it would give the other one a second chance.

Secondly, a parallel discussion took place between the two over the possibility that Volvo was planning for a new car model together with the British company Wilkinson. The idea was a small cabriolet. Uddevalla was preferred as a location because of logistics and the close relations to the car industry complex in West Sweden.

Speaking of Uddevalla, it must be mentioned, that it is one of three small towns working together, Trollhättan with SAAB and Volvo Aero, Vänersborg, the administrative centre and Uddevalla. The three towns have a common university college which has among other programs specialized in engineering.

The new factory, however small, has survived but the whole region was later shaken by the discussions concerning the future of SAAB. The Swedish government has taken part in the discussions with the former owner GM and its choice between Trollhättan and Rüsselsheim in Germany. The Government



re-allocated money from the national investment plan for roads and infrastructure to support Trollhättan and later also took part in the discussions between GM and Spyker concerning the loans from the European Bank. There are still a number of questions in the air about the durability of SAAB but the recent agreement between SAAB and BMW have increased the expectations.

The huge shipyard area still offers options for new investments which will take some time to exploit.

## **6. Landskrona**

The big shipyard was a very important part of the town's industrial structure and the small town suffered relatively hard from the change. The shipyard has survived as a repair and sheer-metal shop but on a significantly lower level.

The town has an excellent location between Malmö and Helsingborg but has still not been able to make use of it. The rapid close down of the big shipyard caused a lot of empty flats and problems for the local housing company and the economy of the city. The housing problem was partly solved by offering immigrants (refugees) a home.

This has however created a new situation when Sverigedemokraterna (the Sweden Democrats), with a stronghold in the most southern province of Sweden, Skåne, was represented in many local parliaments in the election 2006 and Landskrona became its major focal point.

The former neo-nazist movement has gone through a major change of its political program and has succeeded to make it popular to a broader public. Its main focus is criticism of the Swedish immigration system and demands on more law and order. The party has now made it all the way to the Swedish Parliament in the election 2010.

## **7. Oskarshamn**

This shipyard has followed a similar path as Landskrona as the new construction stopped first in 1982, a new attempt was then closed in 1995 and since then the shipyard is a repair shop.

Oskarshamn as a city, however, has been able to meet the downgrading of the shipyard by new developments in the nuclear plant industry (one of Sweden's three plants is located in the community) especially for taking care of the nuclear fuel waste. The so called intermediary stock, waste embedded in copper capsules, is located in Oskarshamn.

The development of the harbour area was for many years stopped because of the discussion in Sweden where the final storage of nuclear waste would be. The fight finally was between Forsmark nuclear power plant north of Stockholm and Oskarshamn. In spring 2010 it was decided that the plant, or rather deep mines, would be located in Forsmark.

Oskarshamn was promised some compensation in the nuclear area and money to develop the infrastructure. This means new options to think strategically concerning the harbour area.

## 8. Other shipyards

Falkenberg closed in 1987 and has also continued as a repair shop.

Gävle closed in the 1960's, the area has been slowly exploited for housing and some office buildings.

Helsingborg closed in 1966 and has developed a logistic centre and a very nice housing complex. Helsingborg managed to use the new situation to be one of the leading logistic centres in Sweden. The coastline has been used to build a nice housing block that has been considered as a very good example of Swedish housing with a fantastic view over Öresund to Elsinore.

Finnboda, 1979, in Stockholm had a very different history. Stockholm has always a lack of central land and the capital city of Sweden is developing fast. In the fight for survival of Finnboda there was never a strong local support and there is nothing similar to Gothenburg and Malmö which will be discussed later. Finnboda was seen as an époque that had ended and not as a disaster for Stockholm.

## 9. Malmö

The third biggest city-region in Sweden was seen as an industrial region up to the crisis in 1991-1994. The shipyard Kockums was an important part of this structure as Kockums also had other products like railway wagons, wind power towers, oil-platforms etc. and a very competitive engineering basis. The crane was the landmark of Malmö.

The last commercial ship to leave Kockums was already in 1987 but at the same time they managed to take an order of submarines from the Australian government that offered a possibility to survive up to 1998. Kockums in Malmö also owned the shipyard in Karlskrona which gradually took over the production of other marine products like the surface combat ship Smyge (stealthy) with a very low exposure to radar.

The city of Malmö, now facing a tough change, was promised help from the state by locating a SAAB factory to the Kockums premises and an industrial hall was actually built but never used.

Three other things helped to make a special change in the outlook for Malmö.

The first thing was the start of Malmö University College in 1997. This University was one of the last two to be started in Sweden, together with Södertörn in the southern part of Stockholm. Both were the result of a national intension to find ways to attract new categories to higher studies like workers and immigrants. Malmö had as a traditional industrial town a high proportion of workers but had also got a high proportion of immigrants.

The university was thus seen as a tool to change the structure of the labour market.

This new university had a successful start and has now 20,000 students. In the same city-region is Lund University located, one of the best and oldest in

Sweden. They had had problems to attract the categories mentioned above from Malmö and to offer the programs needed.

There were of course some parts of Lund University already existing in Malmö like the School of Education, some programs for Engineering etc. but the new University managed to offer a much more complete solution.

The new university was offered premises on the Kockums area and today all the major university buildings are on that area including a brand new library overlooking the old ferry harbour to Copenhagen.

Discussions over a science park also started in the 1990s using a part of the Kockums facilities together with a real estate company and Malmö joined the Soft Center movement. However, the results of the co-operation with the real estate company turned out to be more of an office block than a science park. The city then changed its strategy and started MINC (Malmö Incubator) which also got old facilities in the Kockums area but now with a strong emphasis on starting new companies in close co-operation with the new university.

The big change was however housing. In Sweden there is a tradition called BO (living) where every year one city is selected to show up its new buildings in order to offer some insight to and debate on Swedish building concepts. This movement is supported by the Swedish Planning Agency, Boverket.

Malmö was chosen in 2001 and the exposition was called BO 01. (As a remark Helsingborg harbour development was an earlier BO city)

BO 01 was a success, built highly on Kockum's ground, with its near access to the city centre and with a view on the water (Öresund) and of course Copenhagen, The new flagship or landmark of Malmö, when the Kockums Crane from 1974 finally was torn down, was "Turning Torso", a multi-storey house with flats for people who looked for a "room with a view".

The SAAB plant could be used as premises for Malmö Fair and step by step the heavy industries are leaving the area for example the railway wagons and wind-power towers to Trelleborg, a nearby town.

The second important step that must be mentioned is of course the building of the Öresundbridge. That has been discussed over a long time (like Fehmarn) and in the South Sweden document "Vision for South Sweden" in 1994 it was seen to be of major importance for Malmö, Skåne and all of South Sweden.

There was opposition to the bridge from the Green party but also the Centre Party and caused no enthusiasm in Stockholm but finally the decision was taken and the bridge was opened in 2000. (A small notice, the steel pillars in the bridge were delivered by Kockum shipyard in Karlskrona).

The bridge has certainly made Malmö a part of greater Copenhagen and the integration is going on, slowly but significantly. A few examples, there are a lot of Danish people moving to Malmö because the housing is cheaper, a lot of young Swedes are finding jobs in the Copenhagen service sector and there are many, from both sides, going shopping to the other side and finally Copenha-

gen has a lot to offer culturally.

The third step is also a huge investment, building an underground railway through Malmö to the bridge. The present railway station is a dead-end and the new line opens up for more traffic and will make Malmö the hub of South Sweden and help to integrate it with Copenhagen.

In connection with the forthcoming Fehmarn-bridge, which was also mentioned and hoped for in the Vision for South Sweden, this will increase the possibilities to increase the trade between Öresund region and Hamburg and connect to Europe in the age of the rapid trains.

Malmö can no longer be seen as an industrial town but more as a part of Copenhagen or the Öresund region as the Malmö people prefer to say. The region Skåne has, since the 1990s, been given more power to steer its own course. That is an important factor when one looks ahead.

The engineering skills of Kockums are still there, the Maritime school has become specialized on an international market and there is definitely a new belief in the future that is shown in the increasing prices on housing.

## **10. Karlskrona**

Karlskrona has since the county Blekinge became Swedish in 1658 been of outmost importance for the Swedish navy as it is more ice-free than Stockholm and less vulnerable than Gothenburg (especially in the old times).

Karlskrona shipyard is the only remaining construction shipyard of some importance and is building combat ships for the navy, both submarines and surface vessels.

Celsius, the Swedish State Defence company, sold out Kockums to HDW in Kiel. HDW is partly owned by American "One Equity Group". This has made the decision-making relatively difficult as most of the products have military significance both in Kiel and in Karlskrona.

The naval shipyard has a central role in the city but today there are fewer restrictions concerning the military areas which have made it possible for the city to exploit coastal areas.

The city also had a BO area on historic ground (Stumholmen), got a new university college in 1990 to help the city to meet the challenges from a reduction of military employees. The

University is called Blekinge University of Technology with a strong emphasis on technology not least IT.

The city also received a location of a heavy industry, Uddcomb, which was built in a completely new industrial area in the harbour. The industry closed down and the city first tried to use the area for the new University College but later developed it as a ferry-terminal for the line between southeast of Sweden and northeast of Poland.

## **11. Gothenburg (Göteborg)**

West Sweden is the heartland of the Swedish shipbuilding industry and is also

a strong industrial area including Volvo, SAAB, SKF, and many more.

Gothenburg is the major city in the region, Västra Götaland, which has the same strong position in Sweden as Skåne with its own regional development money and a strong influence nationally. Västra Götaland has 1.5 million inhabitants and is the second region in Sweden as Gothenburg is also the second biggest city.

Gothenburg has had a special spirit of co-operation between the city and the bigger companies like the shipbuilding ones. Gothenburg has also by tradition been very international as the major Swedish export harbour and with close links to the North Sea while Stockholm as the national capital has more of state administration and is also more Baltic Sea oriented (around 1900, it had strong links to St Petersburg and now of course Finland).

The University of Technology, Chalmers, was one of two universities in Sweden that were given a freer position as foundations while the other universities are state authorities. As an example Chalmers has managed to have stronger links with the surrounding society than the Royal Institute of Technology in Stockholm (KTH).

The ship-owners and ship-builders have always taken a great part in the city dialogue and so have people from Volvo and other major industries. At the same time it is worth mentioning that Gothenburg has been a stronghold for Socialdemokraterna (Labour), like in Malmö, while Stockholm is the stronghold of Moderaterna (Tories).

This co-operation between the politicians and important industrialists is important to understand when one studies the development of Gothenburg after the ship-yard crisis.

The development of the harbour and the ship-yard areas have a lot of ingredients common to the ones discussed in Malmö and Kalmar.

The river area is very attractive for housing. The international trend that started in Baltimore, US has been followed by HafenCity in Hamburg, the Docklands in London etc.

As this is an international trend, widely exposed in media and magazines it has been possible to convince people that a flat close to the sea or river is a fantastic location even if, for a long time, it will be located in an area under construction.

The "Project Lindholmen AB" started in 1976, two years after the shipyard was finally closed, and was later, in 1981, taken over by the city of Gothenburg. In 1983 an establishment for off-shore safety was built and 1988 the planning for a knowledge centre started.

In 1991 a new school for Chalmers Engineering and School of Navigation was built. (A small remark is that Sweden in the 1970s had five schools for navigation showing the great historic importance of the Swedish Shipping industry. But in the 1970s two were closed, Stockholm and Härnösand and the one in Malmö had to specialize in international upgrading courses only).The

only remaining ones are in Gothenburg and Kalmar.

The old Lindholmen shipyard with its very special location in the middle of the city could be rebuilt very successfully to a knowledge base for engineering courses thanks to co-operation with Chalmers University of Technology.

The other shipyard areas on the north side of the river have been transformed to housing areas with some office blocks. On the south side of the river the new Opera house was built as a part of opening up the river to the people. The Arendal shipyard is however further from the city centre and parts of it have so far been used by industries like Volvo.

A small history of pride from the old areas is the building of a replica of a ship belonging to the Swedish East Indian company that became a wreck in the harbour coming home from its journey to China. The replica was launched at the north side of the river and has made a successful journey to Guangzhou and Shanghai in China in 2006.

## **12. Conclusions**

As can be seen from the examples above, where Kalmar and Malmö have been looked upon in more details, they show a similar history.

The international trend is clear:

- the Western society is going from an industrial society to a knowledge based society.
- it is more interesting today to live in the harbour areas which for a long time were seen as ugly and noisy.

Where there has been a redevelopment of these city areas both trends have been possible to combine to shape the new face of the city while using this empty land that has been demolished or seen as unattractive with ultramodern houses and offices.

The change has of course both winners and losers. The winners have been those people that have been able to see the new opportunities in the service sector and the new housing possibilities.

The losers are the people who were employed in the heavy industries and have not been able to switch to the new jobs because of age or lack of competence. For some people this has been a disaster, for instance when the Volvo plant closed 1994 in Kalmar 200 out of 800 have never succeeded to come back to the labour market while in comparison it happened to 50 out of 500 when the Bombardier closed its railway wagon factory in 2005.

The Volvo plant of course closed in the worst industrial crisis in Sweden while the Bombardier closed at a much better situation.

A great difference was, however, that the Volvo plant was a pure production line while the Bombardier plant also had a relatively big pool of experts.

The closing of the shipyard in Kalmar, however painful for the workers, was a relatively small part of the labour market while the same occurrences in Landskrona and Uddevalla were of major significance.

Malmö had a great opportunity to change from an industrial town to a knowledge based one and could also do it by strategic national investments like Öresund bridge, the underground railway and the new university.

Västra Götaland has been supported by a huge national infrastructural program and the region was large enough to cope with most of its problem within a given structure. But it is also true to say that both Gothenburg and Malmö have lost relatively in comparison with Stockholm.

It is important to mention and stress that it is up to the city, too, to make these arrangements and take the lead. A close co-operation between leading politicians and business leaders is of outmost importance. In both Skåne and Västra Götaland the new regions had more muscles to do regional efforts and needed not to depend solely on Stockholm.

The final question has never been answered, however, how long would the public sector support the losing companies/sectors in a structural change to make it possible to find new solutions. This is a million dollar question, balancing the winners and losers, it differs in times of boom or depression, differs in big and small regions and of course in the views of the losers and winners.

In 1984 I had a discussion with Professor John Goddard at Newcastle University and director of CURDS, an analysing group at the University. CURDS had done a lot of studies of the change of the Newcastle area and other similar areas in Europe. He thought that it is fruitful to help companies in a structural change as long as there are some fresh parts in the company to be able to give time for helping the employees to new chances.

Things that the states, regions and cities can do are:

- to support the unemployed as quick as possible,
- to help build networks,
- to support initiatives
- to engage/force the companies to make them take their own responsibility.

The state can support through its mechanisms like education schemes and in some cases build a better infrastructure,

The cities must take the lead in finding new solutions, in close co-operation with new investors. Those can be real estate agents in housing and companies/directors willing to support new tools like incubators and science parks. These latter can often be seen as costly in the short run but there are few other alternatives to smart innovations if the Baltic Sea Region is to still be competitive with China and India.

The swift of shipyards from Sweden to Japan has then gone further from Japan to Korea and now to China. These changes will occur in other sectors and it is necessary to learn about them to be able to handle the changes swiftly and with great emphasis. All the time, people need to climb the competence ladder, but and at the same time, be aware that they leave no one behind.

One of the last examples will be an interview with Michael Chang, vice director of Ericsson in China, who made his doctorate at KTH in Stockholm. On

the question in Beijing 2001, what Swedes are good at, he responded, “you are good at thinking and working in systems – but you need to be quicker”.

The final conclusion therefore is, the learning from each other in the Baltic Sea Region must be increased, the co-operating must be improved and people must follow and learn more about what is happening in China and India. They are already challenging European countries and China is allocating more money to R&D than Italy and other South-European countries.

The author assumes the Nordic countries and Germany are strong enough to meet this challenge. The Chinese know this too and that is why they are so eager to share technologies with North Europeans and to know how they are working. In an ongoing project called “Transfer Technology Center” between the Baltic Sea Region and the Yangtse River Delta they are trying to tackle these questions.

Maybe naively assumed, the author thinks that the Chinese are clever enough to copy products but they will have greater problems to copy the way of thinking and working in systems of Europeans.

However, these things are changing too. Three years back, Chinese Companies still thought that courses on innovation were not necessary in MBA studies but now they are demanding it.

In 2004 Geely was asked to make a bid on Volvo but they said they were not competent enough. 2010 they obviously think they are.

Now other European countries have the task to make their coastal cities more attractive for the future. They should not look back to much of what was described of Sweden, they need to find their own new and challenging ways.

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**Rosberg**, Göran , Information Director, City of Malmö.

**Gunnar Prause\***

## **Regional Networks as Success Factor in Structural Change of Maritime Industry – The European Experience**

The maritime industry in Mecklenburg-Vorpommern is situated in the middle of a turbulent period since the start of the financial and economic crisis in 2008. Whereas the field of maritime logistics started to recover from the beginning of 2010 the maritime industry is still facing times with low business activities. This bears especially for the economy of Mecklenburg-Vorpommern a special challenge because the shipbuilding sector is still the industrial backbone of the region, usually being responsible for approx. 20% of the regional industrial turnover, more than 350 maritime companies and approx. 12% of all industrial work places representing more than 13,000 jobs.

Already before the crisis the shipbuilding sector in Mecklenburg-Vorpommern was revealing some strategic weak points which were well known to insiders but which were hidden until the economic crisis put the reality to light. Some of these weak points were related to management decisions including the product portfolio but other reasons for the existing weak points were more related to the special situation appearing in transition economies. Like in all countries in Central Eastern Europe, Eastern Germany also had to pass a long transition process from a communist to a capitalist system with a lot of consequences on the business structures. Despite the fact that the shipbuilding sector has been able to be kept in the transition phase as one of the few successful industrial clusters in Eastern Germany there are still a lot of features which are characteristic for transition economies.

This paper will concentrate on the situation in the shipbuilding sector in the North-Eastern part of Germany, Mecklenburg-Vorpommern, 20 years after reunification. In general by comparing the business structures between Western and Eastern Germany it has to be stated that there is still a lack of big companies and industrial clusters in the East, so its business structures are mainly dominated by SME or networks of SME. These specifics of networking and cluster building in Eastern Europe have been the topic of a lot of studies where Wismar University took part in several national and European projects with focus on European SME structures around the Baltic Sea Region. This paper will mention the most important results related to shipbuilding.

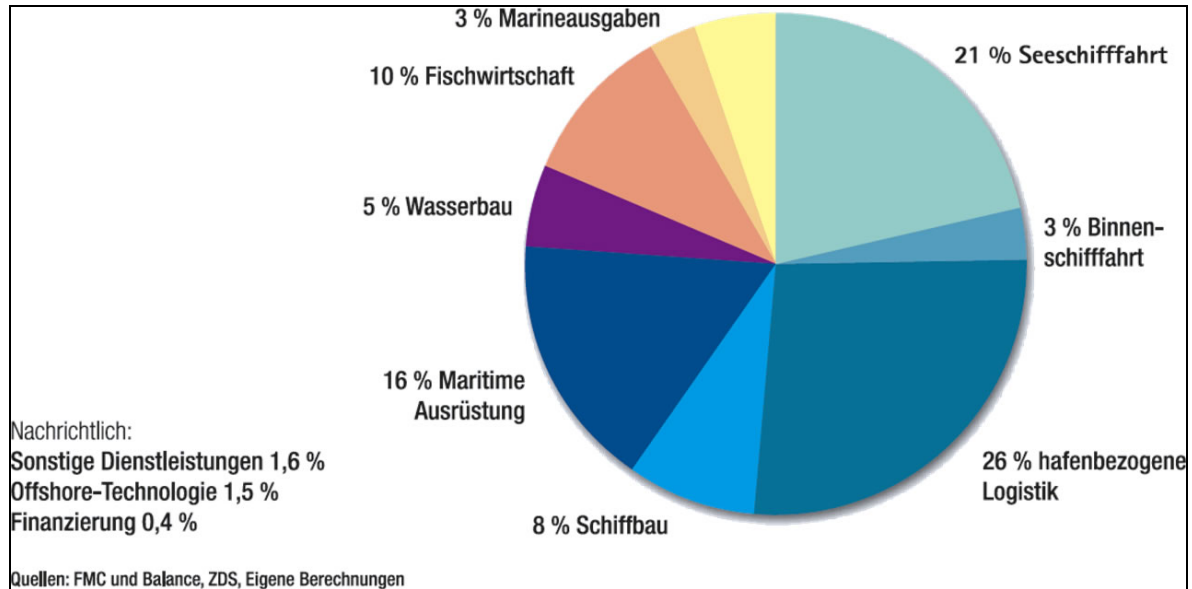
### **I. The German Maritime Sector**

Before the financial and economic crisis the German maritime economy counted more than 380,000 employees and generated a total turnover of more than 48 bn € The German commercial fleet has the second place in the world (2007: 3,281 ships) and when it comes to container vessels Germany is con-

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trolling the largest fleet worldwide with approx. 1,400 containerships representing a market share of approx. 37%. Germany is representing one of the largest and most successful locations for maritime activities with 380 shipping companies and its maritime industry is one of the most important and most progressive sectors in Germany.



Due to its high quality and innovative products in shipbuilding the German shipyards and the maritime supply companies are taking the fourth place in global shipbuilding with a total turnover of approx. 17 bn € and more than 100,000 employees in shipbuilding sector. The German yards delivered 2,5% gt and 3,2% cgt of the shipbuilding production worldwide with an export rate of 60%. German shipbuilding supply companies are number 2 behind Japan with an export rate of 2/3.

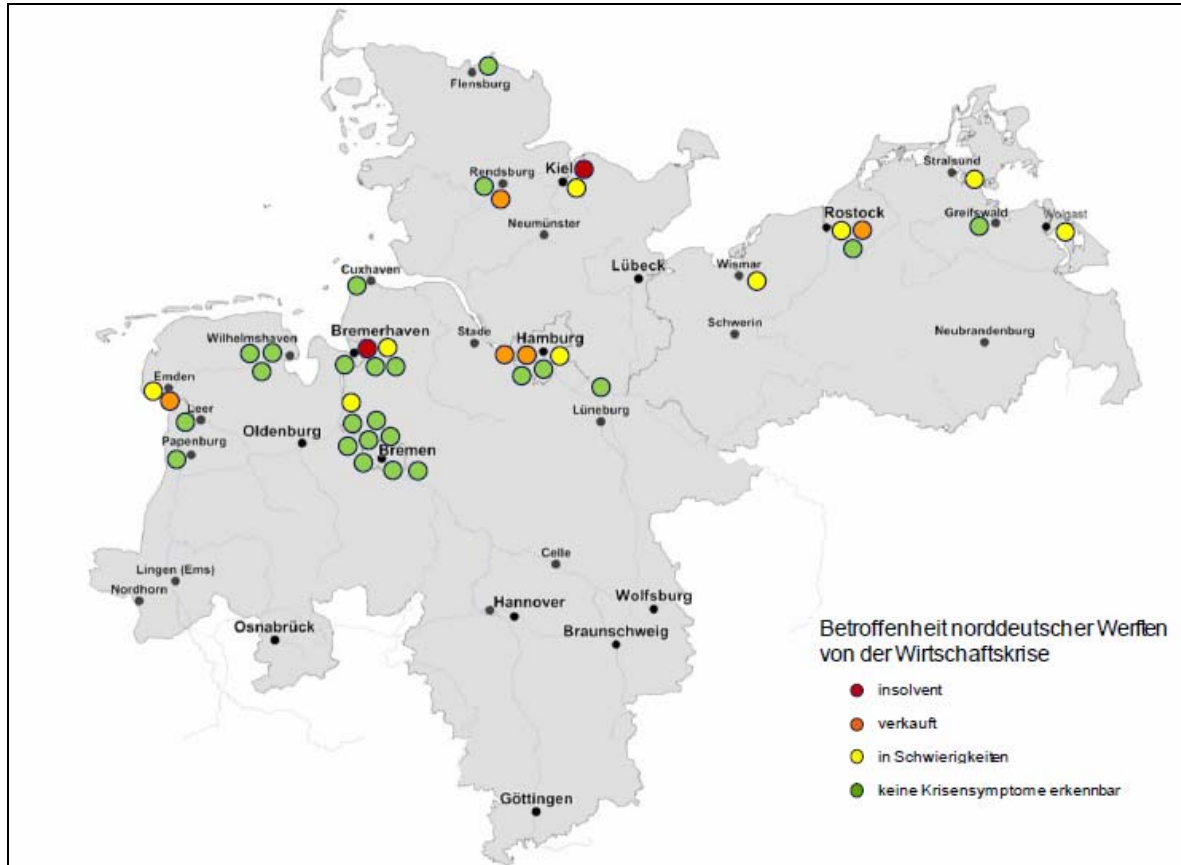
A closer look at the employment in German shipbuilding reveals that approx. 20 - 24% of the workplaces in shipbuilding sector are inside the German yards where 90% of the employees are working in shipbuilding sector whereas 10% of the workplaces are in ship repair. According to the information of IG Metall Küste (workers union) 50 % of new work contracts are temporary and that 10 – 15% of the employees in shipyards are loan workers. The biggest shipbuilding employers till 2007 were

- Thyssen Krupp Marine Systems 30 %
- Meyer Group 14 %
- Wadan Group 12 %

A strategic consideration of German shipbuilding sector in form of a SWOT analysis was realised in [BM] and is showing the following result:

<p><b><u>Strengths</u></b></p> <p><b>Successful shipbuilding supply industry:</b> No. 2 in the world after Japan</p> <p><b>Shipyards</b> Major systems competence for the construction of complex ships (cruise ships, special-purpose tankers, ro-ro-ferries).</p> <p><b>Marine-technology competence</b> Innovative technologies in underwater robotics, drilling engineering, process control and safety engineering and gas hydrate research.</p> <p><b>Environmental technologies</b> German industry has an enormous development lead (ballast water purification systems).</p>	<p><b><u>Weaknesses</u></b></p> <p><b>Shortage of skilled labour in the shipbuilding sector</b> Only half as many university graduates and highly trained skilled workers as needed.</p> <p><b>Lack of interconnectivity</b> Intra-industry and cross-industry collaboration between industry and science needs to be increased. LOW horizontal cooperation – high vertical cooperation</p> <p><b>Below-average growth</b> Growth rates posted by Germany's maritime technology industry fall short of the sector's worldwide growth.</p>
<p><b><u>Opportunities</u></b></p> <p><b>Technology lead in shipbuilding</b> Shorter production times and more stringent quality, environmental-protection and safety standards.</p> <p><b>Exploitation of natural resources</b> Increasing amount of oil and gas production in deep water (below 500 meters) and ice-covered regions plus large gas hydrate deposits along the shelf edges as a new resource.</p> <p><b>Offshore wind energy</b> Tap potential.</p> <p><b>Environmental standards</b> German industry's participation in the development of international standards.</p>	<p><b><u>Threats</u></b></p> <p><b>Tough competition</b> Strong international competitive pressure, particularly from Asia and a know-how drain to competitor countries..</p> <p><b>Expensive quality</b> Expensive safety and environmental protection standards can be enforced only through international regulations.</p> <p><b>No international heavyweights</b> No German global players in international offshore markets and no companies that operate deep-sea production facilities for gas or oil.</p>

The situation in Western and Eastern shipbuilding is completely different because of the restructuring process after the reunification in Eastern Germany where the whole shipbuilding activities are concentrated in the region of Mecklenburg-Vorpommern. An analysis of the consequences of the financial and economic crisis on the German shipbuilding yards is revealing the special Eastern German situation where more than half of the yards are currently in difficulties [AB]:



## II. Maritime Industry in Mecklenburg-Vorpommern

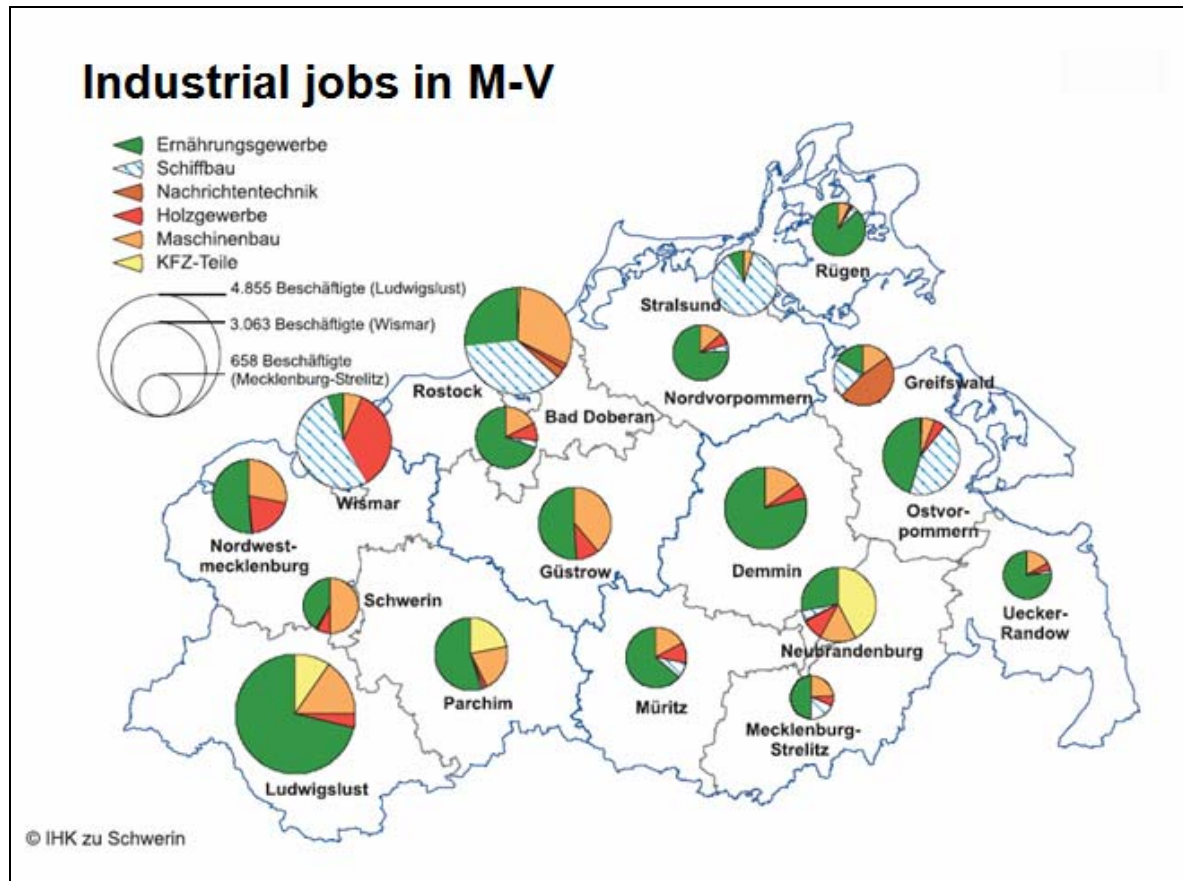
Mecklenburg-Vorpommern (M-V), located between two of the largest cities in central Europe, Hamburg and Berlin, is Germany's gateway to the Baltic North and North East with a growing importance as a hub for maritime traffic to and from Scandinavia, Eastern Europe, and overseas. The region is connected to a number of important ports in the Baltic Sea Region (BSR) through several ferry and shipping lines. Furthermore modern shipyards and their suppliers, as well as port-related and maritime industries are some sectors dominating the regional economy. Following figures illustrate the regional locations of interest in the maritime sector [MV2006]:

- **Maritime Sector in M-V**
  - 28.000 employees in 2.200 companies
  - Total TO of ca. 4 Mrd € & 1,2 Mrd € of value added
- **Shipbuilding & Suppliers in M-V**
  - 2006: 350 companies with 13.400 employees

<b>Sector</b>	<b>Employees</b>	<b>Value-added</b>
Shipbuilding	19 % ( 6.000 )	20 %
Suppliers	23 % ( 7.400 )	22 %
Logistics	23 %	24 %
Maritime R&D	2 %	4 %
Offshore	3 %	7 %
Fishing	7 %	12 %
Maritime Tourism	23 %	10 %

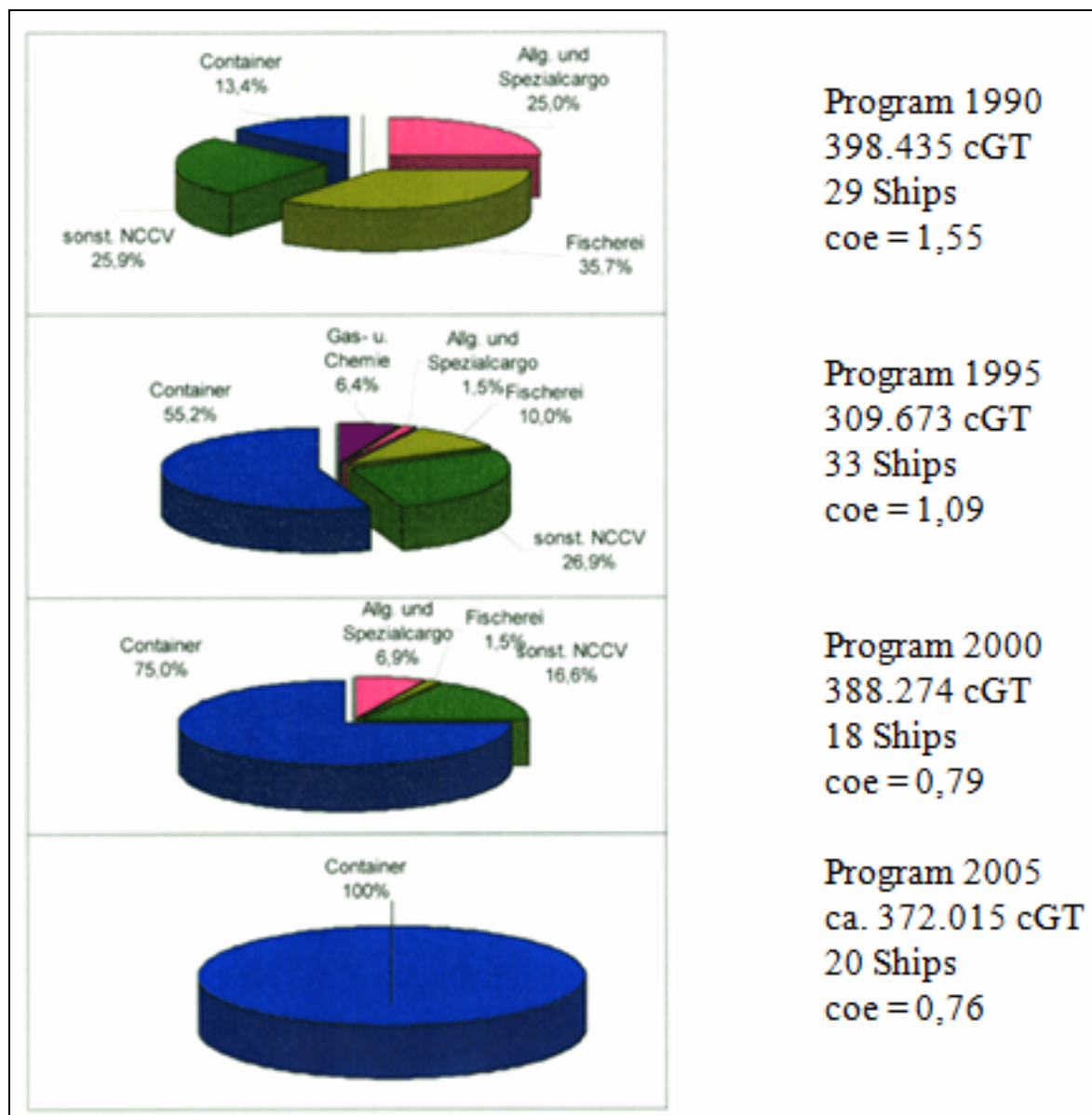
By taking a closer look at the maritime industry, i.e. the shipbuilding sector in M-V, it turns out that the shipbuilding sector is the only industrial kernel of Mecklenburg-Vorpommern, being responsible for 20% of the total production turnover and for 12% for all regional industrial workplaces. The main activities in shipbuilding are located in the environment of the four main shipbuilding destinations of Wismar, Rostock, Stralsund and Wolgast. By summing up only the jobs related to the shipbuilding yards the number is reaching approx. 6,000 employees, consisting of approx. 5,000 employees and approx. 1,000 loan workers and representing approx. 25% of all German shipyard employees.

The total number of ships build in Mecklenburg-Vorpommern in 2007 were 28 ships with a total turnover of more than 1 bn € representing approx. 30% of German total turnover in shipbuilding sector. How important the shipbuilding sector is for the cities mentioned above can be considered in the following chart showing the percentage of industrial workplaces in different regions:



By analysing the structure of the product portfolio of the shipbuilding sector it turns out that the shipyards in Mecklenburg-Vorpommern produced 38% of the total German cgt in shipbuilding but the corresponding turnover was only 28% in 2007 revealing that M-V yards are producing ships with 75% of the German average value for a ship. This fact is not very surprisingly because the main products from M-V yards are container ships which are representing low value products in shipbuilding and where Mecklenburg-Vorpommern is responsible for 43% of all German built containerships. The increasing importance of container shipbuilding in M-V can be observed in the following chart [RM]:



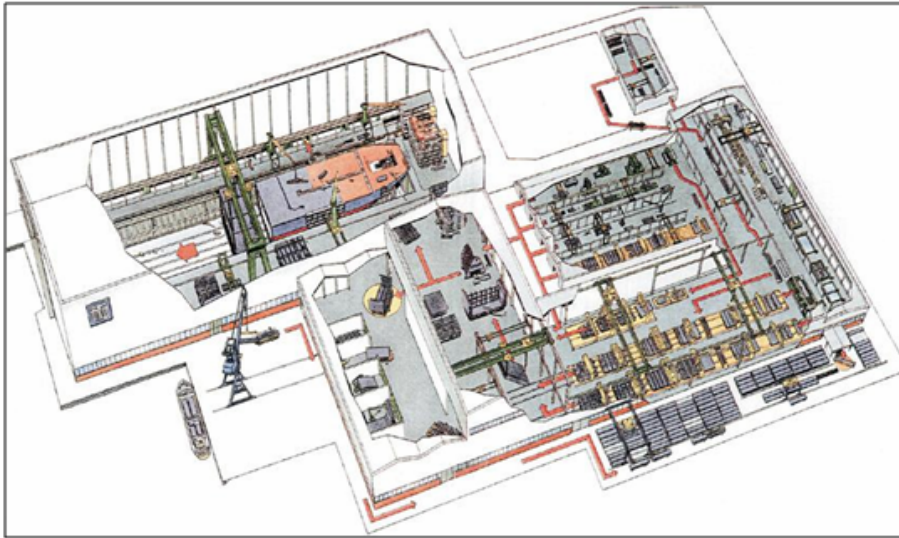


This chart explains the development of the production portfolio of the M-V shipyards from 1990 to 2005 expressing the decrease of the average cgt – coefficient of all built ships till recent times where nearly 100% containerships were produced.

The reasons for this degeneration of the production portfolio were mainly caused by the approx. 20% lower salaries for shipbuilding workers in Eastern Germany together with the newly constructed modern shipbuilding yards (compact yards; after 1990) which were designed for mass construction with a high productivity which was approx. 1/3 above the German average:



## Example: Compact Yard Wismar



Since 1990:

2,1 Mrd. €

direct public  
support  
for  
compact yards  
in  
MV

- **AKER Wismar:**

**300 Mio. € for compact yard in Wismar  
including 100 Mio. € for the Yard Hall**

Some Facts:

70 m height x 345 m x 66 m

Water depth: 13 m

Including 800 t – crane and smaller cranes

Setting of the sections in the building dock

Dock for up to 250.000 TDW ships

But even these efficiency considerations were not enough to keep the German containership production competitive against the Asian yards. Still in the peak times in container orders in 2006 the price for a container ship from Mecklenburg-Vorpommern was approx. 30% higher than the price for a container ship from Asia. And since 60% of the container ships were exported from Germany the price level was a permanent disadvantage for the M-V yards leading to an economic disaster in times of the starting financial and economic crisis where nearly no more new ships were ordered.

This productivity disadvantage of the German container ship production was linked in Mecklenburg-Vorpommern with a structural disadvantage in the maritime supply sector. It is well known that there is not a real return in shipyard operations so most of the yards are operating with profitability around zero. The economic more interesting sector is represented by the maritime supply companies which are more profitable than yards and which are enjoying an export rate of approx. 2/3. However, unfortunately, only 2% of all German maritime supply companies are located in Mecklenburg-Vorpommern even though more than 25% of the German shipbuilding production is concentrated in the German North-East expressing that not enough shipbuilding profits are kept in M-V related to the production capacity. This represents a real strategic disadvantage because by keeping in mind that in Germany approx. 100,000 employees are working in shipbuilding sector but only approx. 25% are employed in shipyards revealing the huge potential for workplaces and additional profits in a growing maritime supply sector.

### III. Soft factors in Eastern Germany

However, before focussing on the maritime networks it is necessary to understand the socio-economic background of Eastern Germany. In this context it is important to mention that even 20 years after the reunification significant differences in the economy between Western and Eastern Germany exist. So it must be stated that the Eastern productivity reaches still only about 80 % of the Western productivity whereas the Eastern level of salaries is 90 % of the Western salaries.

Furthermore, there are also differences in the number and size of the companies. In average, there are less and smaller companies in the East, which is due to the fact that the majority of the big Eastern companies collapsed after reunification due to the quick privatisation process in the transition period after 1990 and together with the implosion of the traditional big enterprises also a lot of the connected clusters vanished throughout the East. Because of the lack of new cluster kernels, the enterprise structure in Eastern Germany can still be characterized as a tissue or network of SMEs, comparable to nearly all parts of Eastern Europe.

In 2005 Wismar University and the Chamber of Commerce in Schwerin launched a regional survey on international activities of SME's. Over 1,500 companies in the region of West-Mecklenburg - around Wismar and Schwerin - were surveyed with the majority of manufacturing and service companies participating in the survey [BP1]. The region West-Mecklenburg is characterized by a dominating SME sector where nearly 50% of the companies are micro-firms. Thus, expectedly, only less than 10% of all regional turnovers are generated by international operations. Nevertheless, from nearly one third of all companies that showed export turnovers about half of those export active companies were able to generate only up to 10 % of their total turnover from export activities (Median: 12,5%). As a reason for this weak performance in international operations, the SME leaders pointed out insufficient language and intercultural skills to participate in foreign activities.

One of the important side effects of this consideration about the privatisation process is that the spin-off companies were organised according to the East German tradition, mainly in a hierarchical form of organisation. Because organisational principles, like transparency, openness and trust, represented underdeveloped values during the former GDR days, it is problematic for these companies to integrate younger and highly qualified people endangering the renewing process in the field of human capital.

Other results like the empiric studies of the Institute of Sociology of the Friedrich-Schiller-University of Jena, known as the "Jena Study", lead by Rudi Schmidt analyzed 749 SME's in a permanent panel from both parts of Germany and the researchers found out remarkable differences between both management cultures [MMS]. The most important results were:

- only 10 % of the "East" CEO's is younger than 40,

- 94 % of the “East” CEO’s have academic degree,
- the majority of the “East” CEO’s are engineers,
- the majority of “West” CEO’s have a Business Administration background,
- both parts of Germany are preferring a cooperative management style,
- Eastern management style is rather authoritarian and capitalistic.

All these results together revealed substantial lacks in soft skills in large parts of Eastern German business sector. Some of the crucial soft gaps which could be improved by business-oriented education shall be mentioned here:

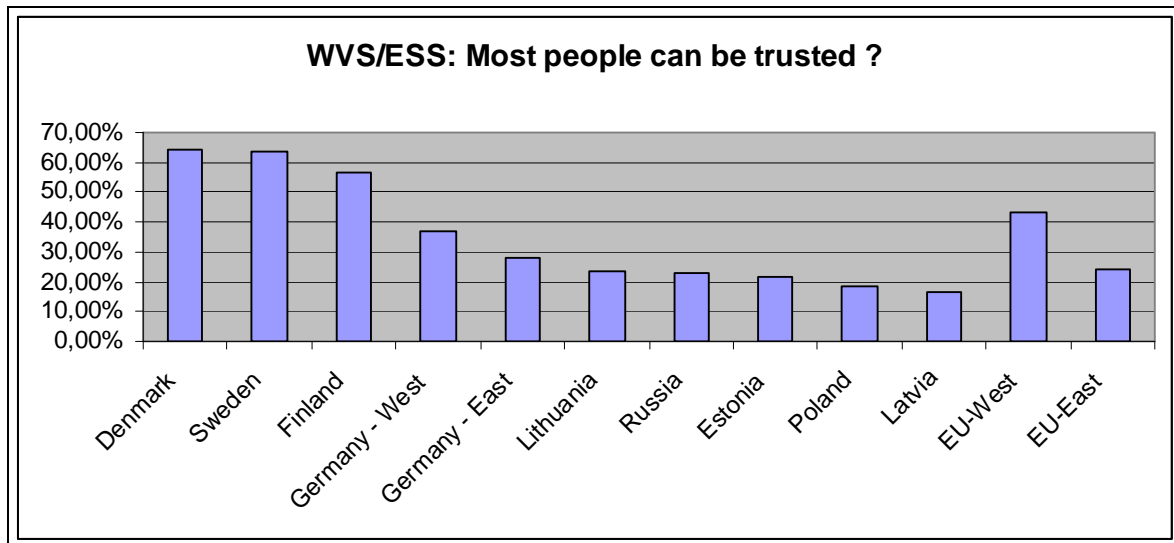
- Underdeveloped international and intercultural skills,
- Hierarchic and inflexible organisational structures,
- Weak networking activities,
- Weakness in innovation.

Based on these and other observations of existing mentality differences between East and the West, Wölf and Ragnitz have worked out a study about networking and cluster structures in East and West Germany where they found out that the networking activities and cluster structures in the East are less developed than in the West [WR].

#### **IV. Networking and Trust**

Trust plays a mayor role in business theories about networking and cluster building. In transaction costs theory a direct explanation is given how to understand the linkage between organisational structures, stating that the lesser the trust in a socio-economic system, the more formal structures are required in organisation and cooperation. Also, game theory is leading to the conclusion that on the long run all parties’ interests are best achieved by a social environment which is as transparent as possible and favours cooperation, reciprocity and trust [AK].

Already a first view on the trust situation within the BSR is revealing differences not only throughout the area but also between the Western countries and the new Eastern countries. As an indicator for the social trust the results from the World Value Survey and the European Social Survey [WVS/ESS] are taken where social trust is defined as a percentage of the population in a country agreeing with the question that “Most people can be trusted”. The characteristic values showing the trust situation in the Baltic Sea Region (BSR) can be found in the following table:



The table is showing that the level of social trust is around 60% in the Nordic states and about 20% in the Eastern countries around the BSR. The European average for the Western countries is around 43% whereas 24% for the Eastern countries show that already the differences of trust levels inside Europe are remarkable high. Germany as a cultural transition area between East and West is enjoying the difference between its Eastern and Western part with 37% in the West and 28% in the East [VD].

#### **V. Example: The Logistics-Network in Seaport Rostock**

The networking study of Wölf and Ragnitz represented a starting point for a regional study at Wismar University about the situation in the seaport cluster of Rostock [PR]. Rostock seaport has been historically the kernel of a maritime cluster with a big number of enterprises and employees working mainly in the environment of logistics. After the German reunification in 1990, this seaport cluster was restructured where the development can be regarded in the following figures:

	1989	1994	1998	2005
<b>Compa-</b>	30	217	168	181
<b>Employ-</b>	10.500	7261	4443	5472

The structure of the companies in the seaport cluster changed from a smaller number of large enterprises during the GDR time to a bigger number of smaller companies in recent days. This is expressed by the average number of employees per company which dropped from approx. 350 in 1989 to approx. 30 in 2005. A number of analyses about the structure of companies and employees have been made by Rostock University and Wismar University and some important results of an actual analysis can be found in [BP2].

The number of possible factors influencing the performance of clusters is immense. Furthermore, the performance of companies inside a cluster can only be understood when their embeddedness is taken into account. The most

complete measure for the performance of clusters is the value added generated in the cluster. The value added generated in the cluster is the sum of the value added generated by the members of the population.

One important approach for measuring the performance of clusters was developed by Peter De Langen [DL] based on the consideration of a set of 8 variables influencing the performance of a seaport cluster where 4 are focusing on the cluster structure and the other 4 are describing cluster governance:

### *I. Cluster structure*

<i>Element of cluster structure</i>	<i>Effect on cluster performance</i>
Agglomeration economies	<ul style="list-style-type: none"> <li>- A shared labour pool attracts firms to the cluster.</li> <li>- The presence of customers and suppliers attracts firms to the cluster.</li> <li>- The presence of knowledge (spill-over) attracts firms to the cluster.</li> <li>- Land scarcity and high land prices 'disperse' firms from the cluster.</li> <li>- Congestion disperses firms from the cluster.</li> </ul>
Internal competition	<ul style="list-style-type: none"> <li>- Internal competition prevents monopoly pricing.</li> <li>- Internal competition leads to specialization.</li> <li>- Internal competition promotes innovation.</li> </ul>
Cluster barriers	<ul style="list-style-type: none"> <li>- Entry barriers (such as inaccessible networks) and start-up barriers (such as non-availability of local venture capital) reduce competitive pressure and prevent the inflow of (human) capital.</li> <li>- Exit barriers (such as 'sticky labour' and cluster specific investments) reduce uncertainty for firms in the cluster.</li> </ul>
Cluster heterogeneity	<ul style="list-style-type: none"> <li>- Cluster heterogeneity enhances opportunities for innovation.</li> <li>- Cluster heterogeneity enhances opportunities for cooperation.</li> <li>- Cluster heterogeneity reduces vulnerability for external shocks.</li> </ul>

## II. Cluster governance

<i>Elements of cluster governance</i>	<i>Effects on cluster performance</i>
The presence of Trust	<ul style="list-style-type: none"> <li>- Trust lowers coordination costs because costs to specify contracts decrease.</li> <li>- Trust increases the scope of coordination beyond price, because the risk of free riding decreases.</li> </ul>
The presence of intermediaries	<ul style="list-style-type: none"> <li>- Intermediaries lower coordination costs and increase the scope of coordination beyond price because they specialize in managing coordination.</li> </ul>
The presence of leader firms	<ul style="list-style-type: none"> <li>- Leader firms generate positive external effects for firms in their network, mainly by encouraging innovation and promoting internationalization.</li> <li>- Leader firms generate positive external effects for firms in the cluster, mainly by organizing investments in the training and education infrastructure, the innovation infrastructure and the infrastructure for collective action.</li> </ul>
Quality of collective action regimes	<ul style="list-style-type: none"> <li>- The more resources are invested in collective action regimes, the better the performance of a cluster. Five variables influence the amount of invested resources:               <ul style="list-style-type: none"> <li>- role of leader firms,</li> <li>- role of public organizations,</li> <li>- presence of an infrastructure for collective action, the presence of a community argument</li> <li>- use of voice.</li> </ul> </li> </ul>

By using the analytical framework of De Langen and applying it to the Rostock seaport cluster it is revealed that nearly all of them belong to the logistics-related sector, outlining that the seaport cluster can be considered as a service cluster. The analysis of the 8 structural variables of the Rostock seaport cluster revealed a picture of the strengths and weaknesses [P1]:

### I. Cluster structure

- a. Strength of Rostock Seaport Cluster
  1. Strong potential of working power
  2. High transportation volume

3. Low rent and real estate prices
- b. Weakness of Rostock Seaport Cluster
  1. Low variety of goods
  2. Low variety in cluster population
  3. Low presence of customers and suppliers

A surprising observation of the results of the study was that knowledge spill-over effects inside the cluster have been regarded as relatively unimportant showing together with the weaknesses in the variety of goods and in the cluster population a strategic disadvantage in the area of innovations of the cluster. The high ranking of the available working power, high transportation volumes and low land prices are revealing an emphasis on operating topics in the perception of the cluster companies.

## II. Cluster governance

- a. Strength of Rostock Seaport Cluster
  1. Presence of intermediaries
  2. High quality in common problem solving
- b. Weakness of Rostock Seaport Cluster
  1. Low trust among cluster companies
  2. Existence of central actors

The stated strengths in the Rostock Seaport Cluster are focusing on the freight forwarders and brokers who are generating and distributing service tasks among the cluster companies. These intermediaries are competent and there is a high quality in problem solving inside the cluster. However, these mentioned strengths are emphasising more the operational level of business activities. When it comes to the weaknesses inside the cluster, the existing low level of trust reveals a strategic problem for the future cluster development. Concerning the issue of trust, it was assessed that the actual level of trust inside the cluster was very low and, additionally, the importance of trust for the cluster development was regarded as low. This weak perception of trust as an important cluster dimension is also expressed in the second weak point concerning the existence of central actors. In general, central actors like the port administration, are taking over the role of moderators between different cluster companies and laying the ground for the common cluster activities and as such, they are fostering trust among the cluster population. So due to the absence of strong central actors inside the seaport cluster the soft dimensions are underdeveloped indicating a strategic weakness of the whole cluster and representing an important threat for the future cluster development.

## VI. Example: Innovation Network: Logistics Cluster Wismar

The national research project „Innovation Network: Logistics Region Wismar“ was initiated in Summer 2008 by the Federal Ministry for Transport, Construction and Urban Development. Under the lead of Rostock University

and Wismar University the research project is aiming to promote and develop an integrative of maritime logistics network around the Wismar seaport by focussing on the following targets:

- Profiling of the logistics region Wismar,
- Implementation of an innovation network,
- Improving the networking activities around Wismar and linking them to the BSR.

The target groups of this project are mainly logistics service providers and freight forwarders around Wismar with a focus on maritime logistics. After a couple of expert interviews focussing on logistics and ICT topics, the project was able to present the first results. By asking the logistics experts about the main obstacles for a stronger integration and better development of the regional logistics network the following answers were given [P3]:

Logistics	<ul style="list-style-type: none"> <li>- Strong fragmentation inside the logistics network</li> <li>- Nearly no ICT – integration</li> <li>- Partitioning-off of the logistics executives of larger companies with company headquarters outside Wismar towards the regional logistics network</li> <li>- Nearly no inter company communication</li> <li>- Insufficient cooperation between the companies related to underdeveloped regional networking skills</li> </ul>
ICT	<ul style="list-style-type: none"> <li>- No common communication platform</li> <li>- Lacking data security</li> <li>- No need/request of ICT – networking between the partners</li> <li>- Different company unique internet portals</li> <li>- ICT – networking is no common target ( too expensive, too vulnerable and too heterogeneous )</li> <li>- No common strategic concept</li> <li>- No real and historical grown cluster structures</li> <li>- Orders are still processed traditionally so there are no common ICT – standards</li> </ul>

Already the first results of the expert interviews around Wismar Logistics network are revealing significant weaknesses in soft factors and strategic thinking. Both sides of the cluster building process, the economic and the ICT parts are suffering from under underdeveloped communication and the will of cooperation. The importance of data security and the strong fragmentation topics inside the potential logistics network are indicating again social trust as a crucial variable in the cluster building process.

## **VII. Consequences and cases of successful networking activities**

### *a. Case: Logistics initiative Hamburg*

Hamburg is representing the German logistics capital with more than 5,000



classical logistics companies and approximately 150,000 employees in the logistics sector. By taking into account also the employees in the logistics service sector like consultation, IT services and transport assurances, the number of employees in the larger metropolitan region of Hamburg even exceeds the number of 230,000 employees. This phenomenon is heavily driven by the development of Hamburg seaport enjoying a steady annual growth rate of more than 10% till 2008. Since 2010 the economic situation at Hamburg harbour is recovering again and facing comparable figures like before the crisis.

In order to strengthen the development of the logistics cluster in Hamburg region, the logistics initiative for Hamburg was founded in 2005 with the target to establish additional 14,000 new jobs in Hamburg and to generate an additional value added in Hamburg of approx. 6 bn €. The forecast for the effects of the activities of the logistics initiative was based on the Regionomia study [RS].

Three topics have been identified as main success factors for the further logistical development of Hamburg:

1. free land for logistical operations,
2. technical innovation projects in logistics,
3. education and qualification in logistics.

As an important bottleneck for the further development in the logistics sector, the study identified a lack of educational capacity in the Hamburg region since the increasing need of skilled workers and employees in logistics was threatening the whole logistics sector in Hamburg. So the logistics initiative stressed heavily the expansion of logistical education and qualification in Hamburg.

One important factor for the Hamburg region is the development of free land for logistical purposes since the high density in the Hamburg region leads to a permanent shortage of space. Under the precondition that the space problem will be solved in the next 10 years, the study is estimating the creation of approx. 700 new logistical jobs in the first year, and up to approx. 8,500 new logistics jobs till 2015. With an average gross value added per employee in logistics of approx. 55,000 € for the next 10 years, the total additional value added from new jobs in logistics was calculated to be approx. 3 bn €

The indirect effects of the logistical initiative have been estimated to be 3 % considering the following 3 topics:

1. Effects from technology and innovation
  - Estimated effect: 1 % per year
  - New jobs: approx. 500
2. Effects due to education and qualification
  - Estimated effect: 0.5 % per year
  - New jobs: ca. 500
  - Additional VA: 80 million €
3. Effects due to cooperation
  - Estimated effect: 1.5 % per year

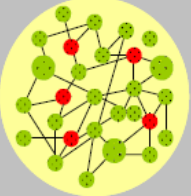
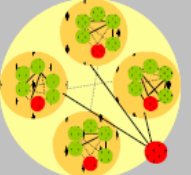
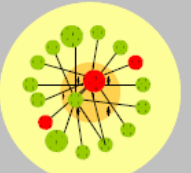
New jobs: approx. 750  
 Additional VA: 230 million €

The most interesting result of this analysis is the relative high value of 1.5 % due to cooperation yielding the same total effect of innovation and education together. The study contained the important statement that the estimated effects of cooperation have been detected already empirically during the writing of the study. Altogether, the study estimated the total effect of the logistics initiative of Hamburg with 14,000 new jobs in direct and indirect logistical sectors and an additional value added for Hamburg of approx. 6 bn € Due to the appearance of the financial and economic crisis it is hard to evaluate how reliable the estimations have been.

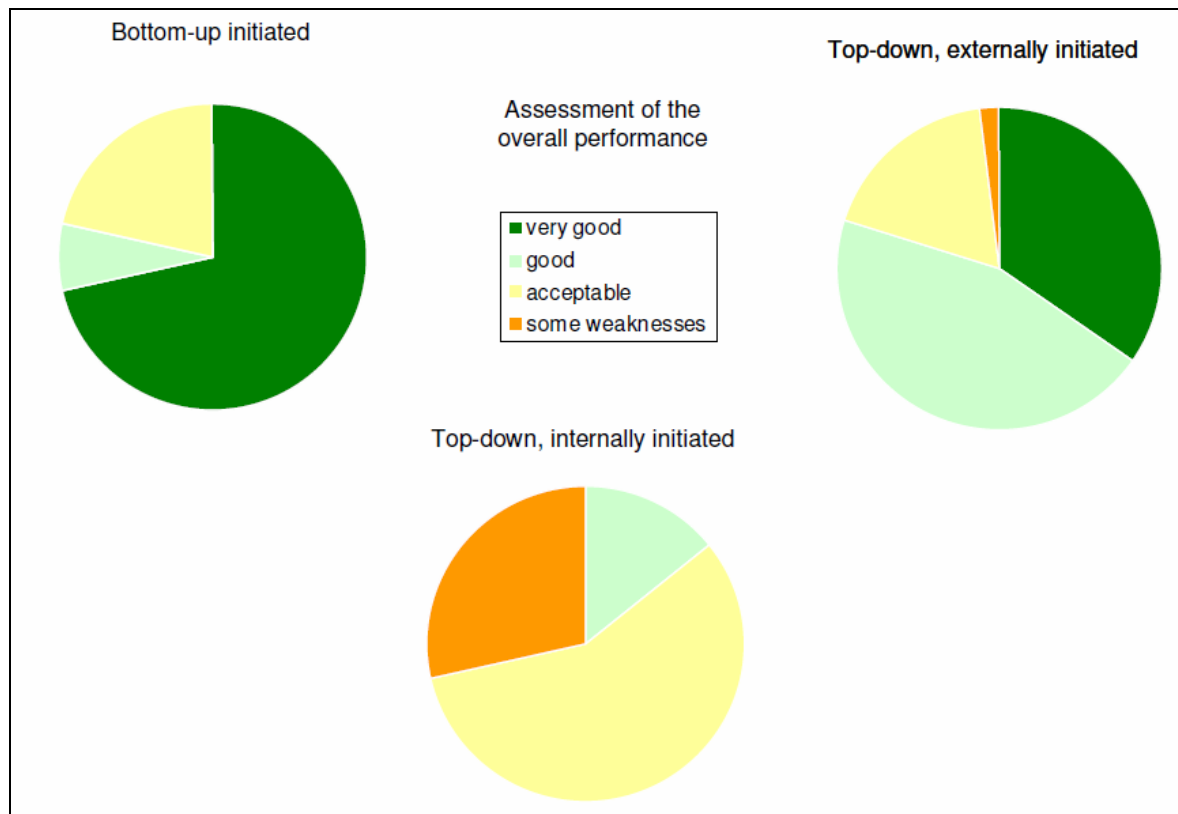
#### *b. Case: Kompetenznetzwerke*

A second case that will be discussed here is the initiative “Kompetenznetze Deutschland” which was funded by the Federal Ministry of Economics and Technology (BMWi), gathering the most innovative, mainly industrial driven regional networks in Germany and supporting them in different areas. Members of selected networks must fulfil specific requirements so that a strong collaborative development of technology, providence of added value for the members, good sustainability of the network, high innovation potential and strong international orientation must be safeguarded.

In the meantime the total number of 107 networks was funded already where altogether more than 6,500 members cooperated consisting of approx. 4,000 SMEs, 700 global companies and at least 1,300 R&D institutions and universities. These members were organised in three different types of cluster where approx. 70% of the networks were organised as “top down externally initiated”, 8% “top down internally initiated” and 22% as “bottom-up”:

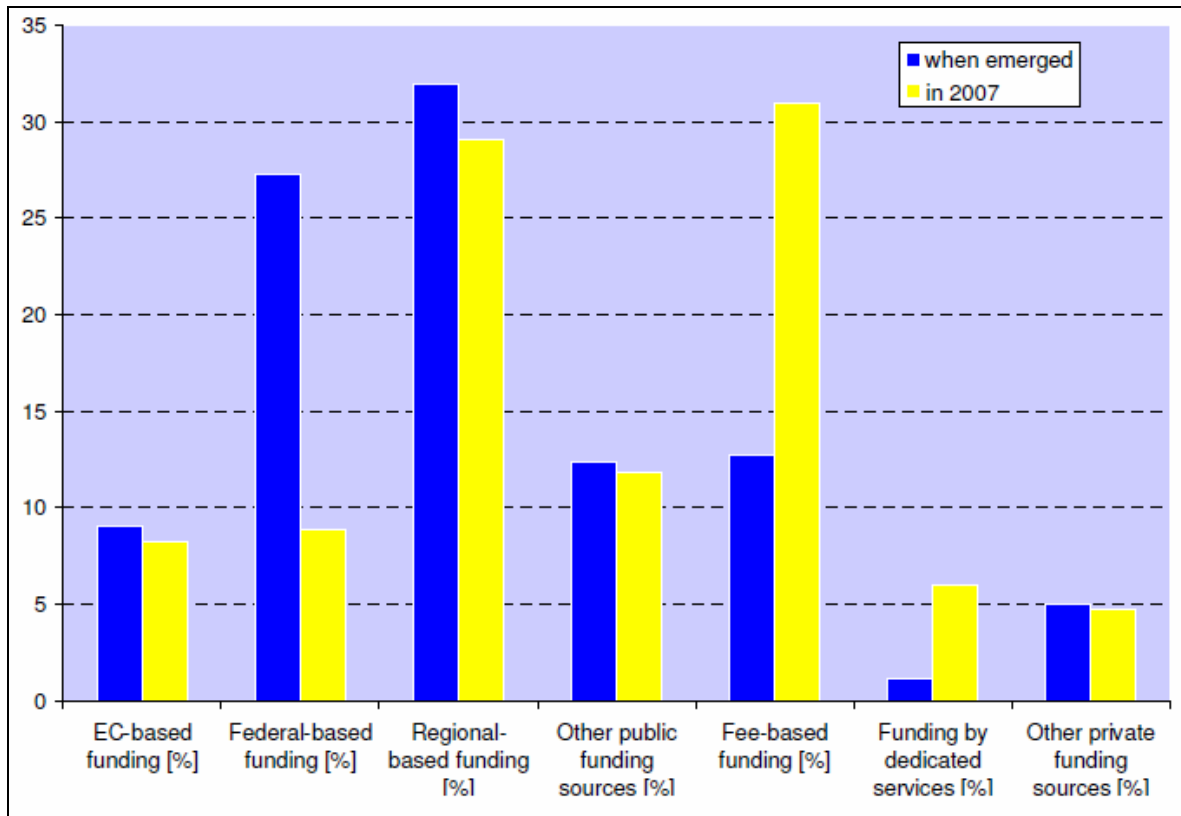
	<p><b>Bottom-up network</b></p> <ul style="list-style-type: none"> <li>➤ decentralized governance</li> <li>➤ network coordinator mostly selected by and member of the cluster, acting as a kind of service provider</li> <li>➤ political influence: low</li> </ul>
	<p><b>Top down network, externally initiated</b></p> <ul style="list-style-type: none"> <li>➤ mostly centralised, but externally governed</li> <li>➤ cluster managers mostly nominated by the initiator</li> <li>➤ political influence: high, mostly initiated by cluster initiatives</li> <li>➤ usually strongly depending on public funding</li> </ul>
	<p><b>Top down network, internally initiated</b></p> <ul style="list-style-type: none"> <li>➤ centralised, internally governance</li> <li>➤ lead organisation (typically R&amp;D institution or university) also acts mostly as cluster coordinator and dominates the work</li> <li>➤ political influence: varying, usually strong dependence on public funding</li> </ul>

Investigations by Claas van der Linde based on the diamond approach of Porter revealed that not only factor and demand conditions were the most important reasons for sustainable cluster establishment but also “other reasons” like cluster management, cluster financing and the settings of an appropriate framework are influencing the cluster development. By analysing the cluster performance it turned out that already the type of network is influencing the performance:

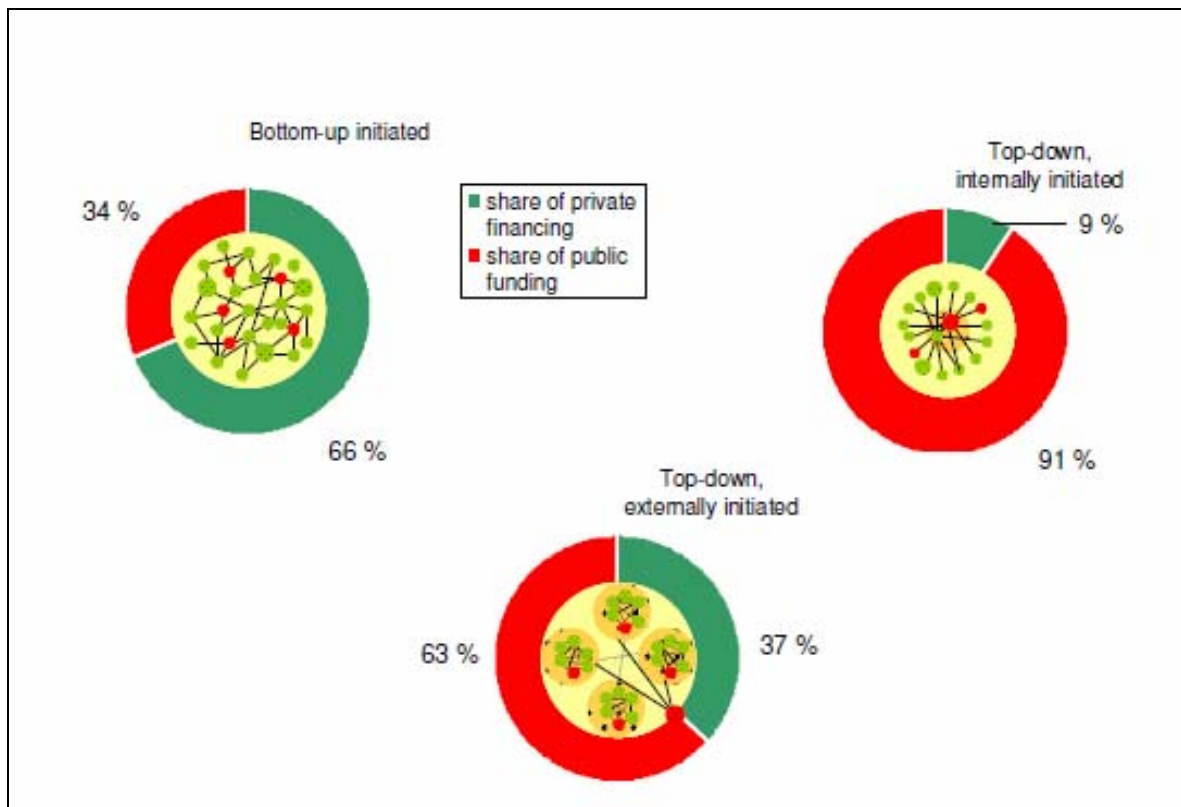


Furthermore the evaluation study revealed that bottom-up networks are much more internationalised than top down networks where the level of internationalisation is about twice as high for the bottom-up networks.

Another important impact factor is representing the financing of the emerged networks. By taking a closer look at the financial sources for the competence networks it showed that in the average 78% of network financing came from public sources whereas 22% were based on private sources. The main sources are federal and federal state funding. This average value of public funding decreases to 57% till 2007 for the considered networks where the share of federal-based funding of the networks decreased from 27% at the time of cluster emergence to 9 % in 2007. On the other side, the shares of EU funding and also regional funding remains almost constant.



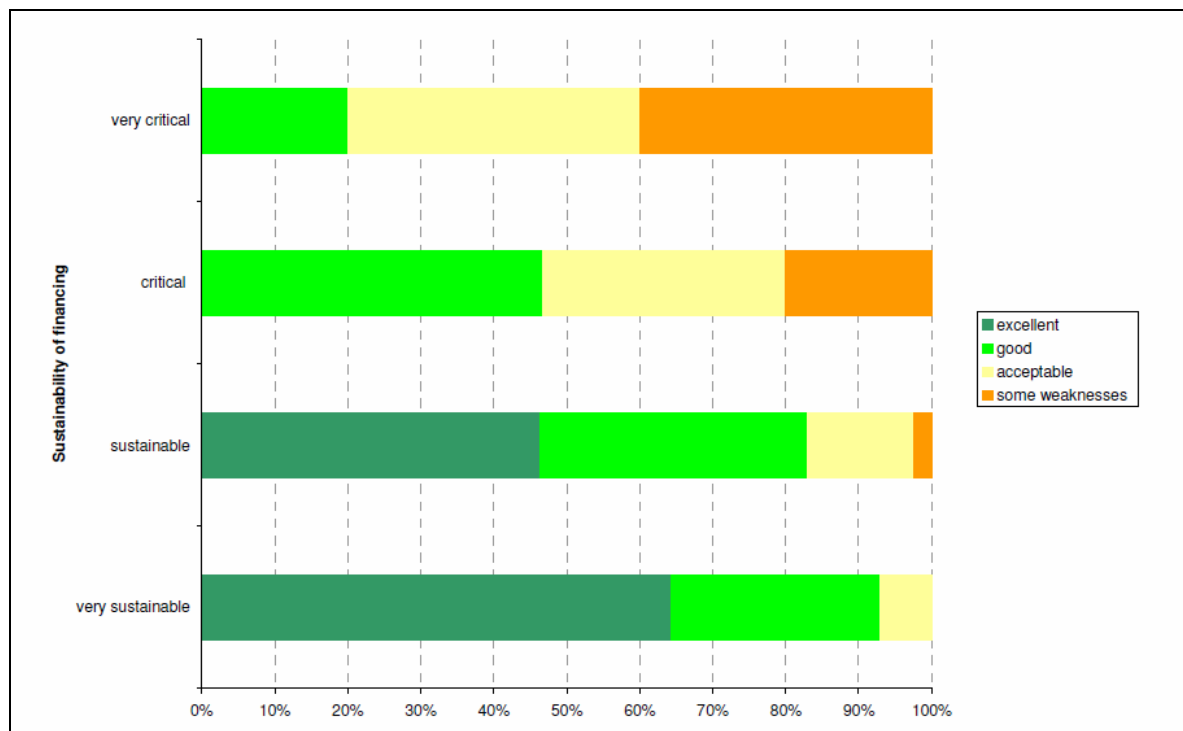
There are, furthermore, remarkable differences in financing, depending on the type of network. Since bottom-up networks are usually based on local initiatives with a special involvement of private sector the degree of private financing for bottom-up networks is usually higher as the following graphic shows:



The network performance is depending on the type of financing. The authors of the study classified the funding into four categories:

- Very critical financing: < 6 months
- Critical financing: 6 – 12 months
- Sustainable financing: 12 – 24 months
- Very sustainable financing: > 24 months.

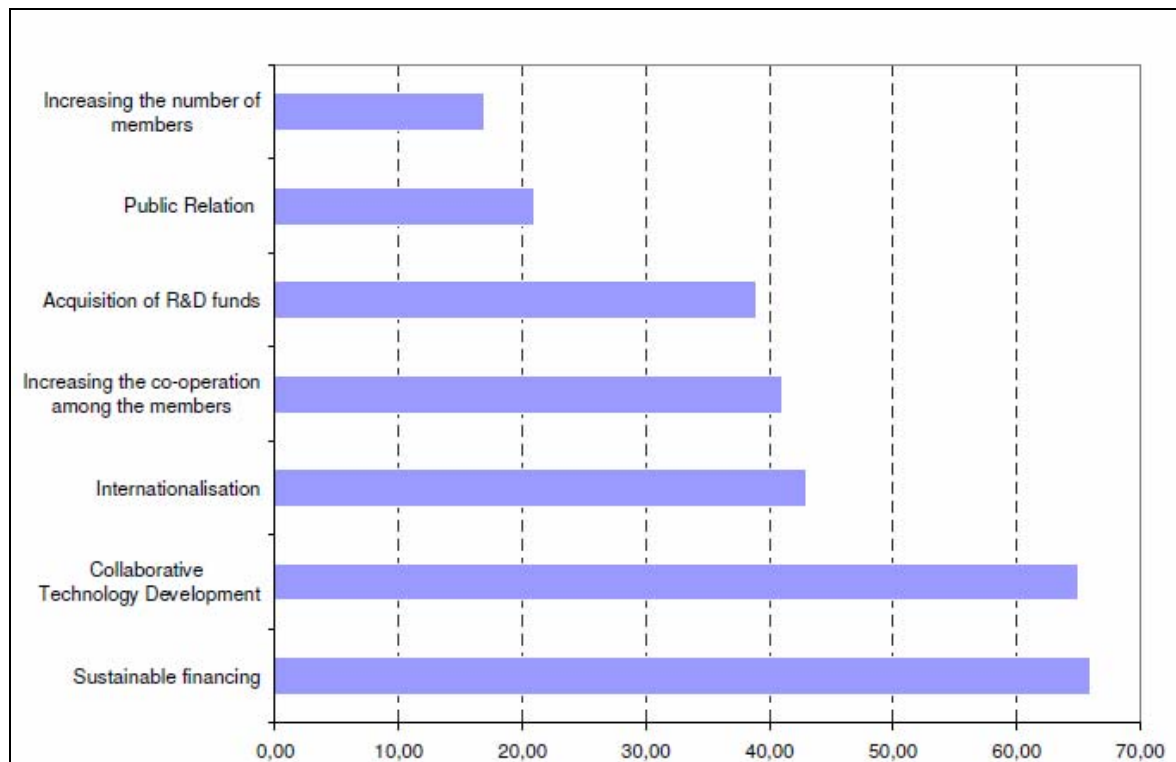
In the study it was asked to which type of financing the own network would belong with the result that 89% regarded the financing of their own network as sustainable whereas 21% were considering their network financing as critical. How high the influence for the type of financing is on the network performance can be seen in the following diagram:



As a conclusion of the performance analysis of the competence networks in Germany the following results can be formulated:

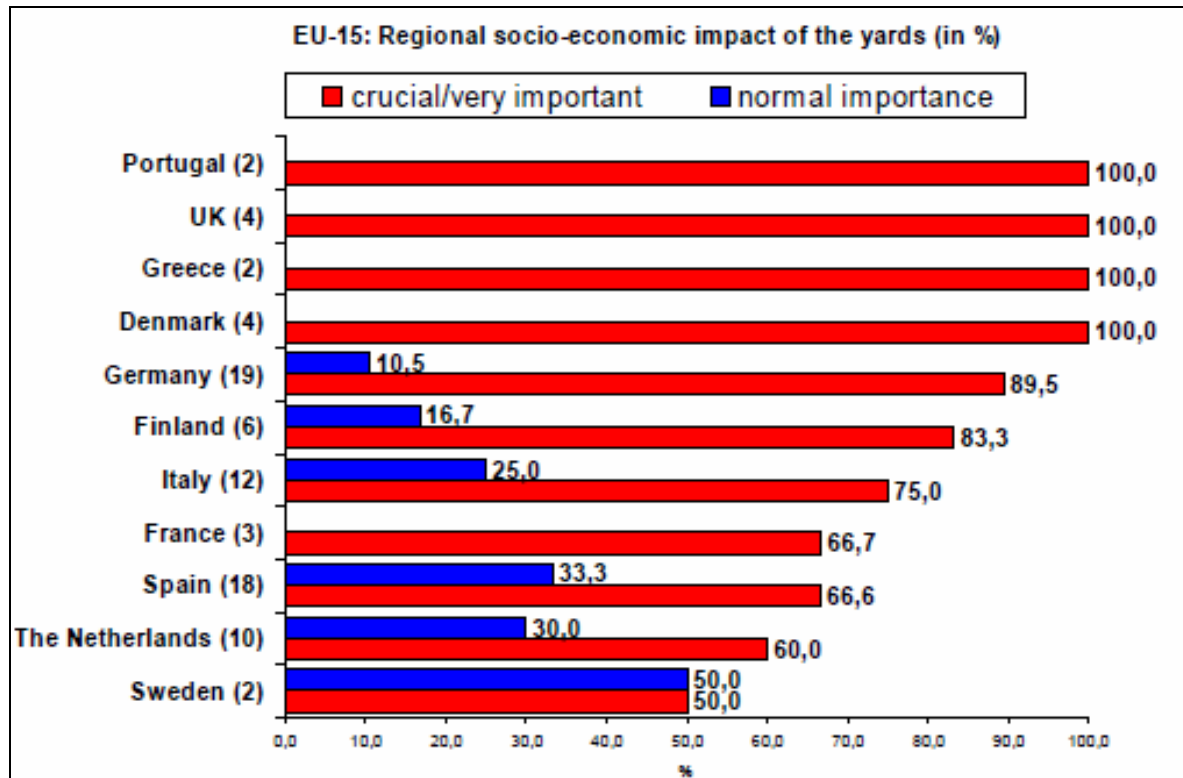
- Top down, externally initiated clusters are the prevailing type of cluster emergence in Germany,
- Bottom-up clusters tend to be more internationalised than others,
- Federal state based funding of clusters last longer than regional funding,
- Sustainable financing seems to have significant impact on the development and performance of a cluster,
- The type of clusters emergence as well as the sustainability of financing of the clusters tend to have an impact on the output performance of clusters.

Finally we want to refer to the most important future challenges by cluster manager's point of view which came out in the study:

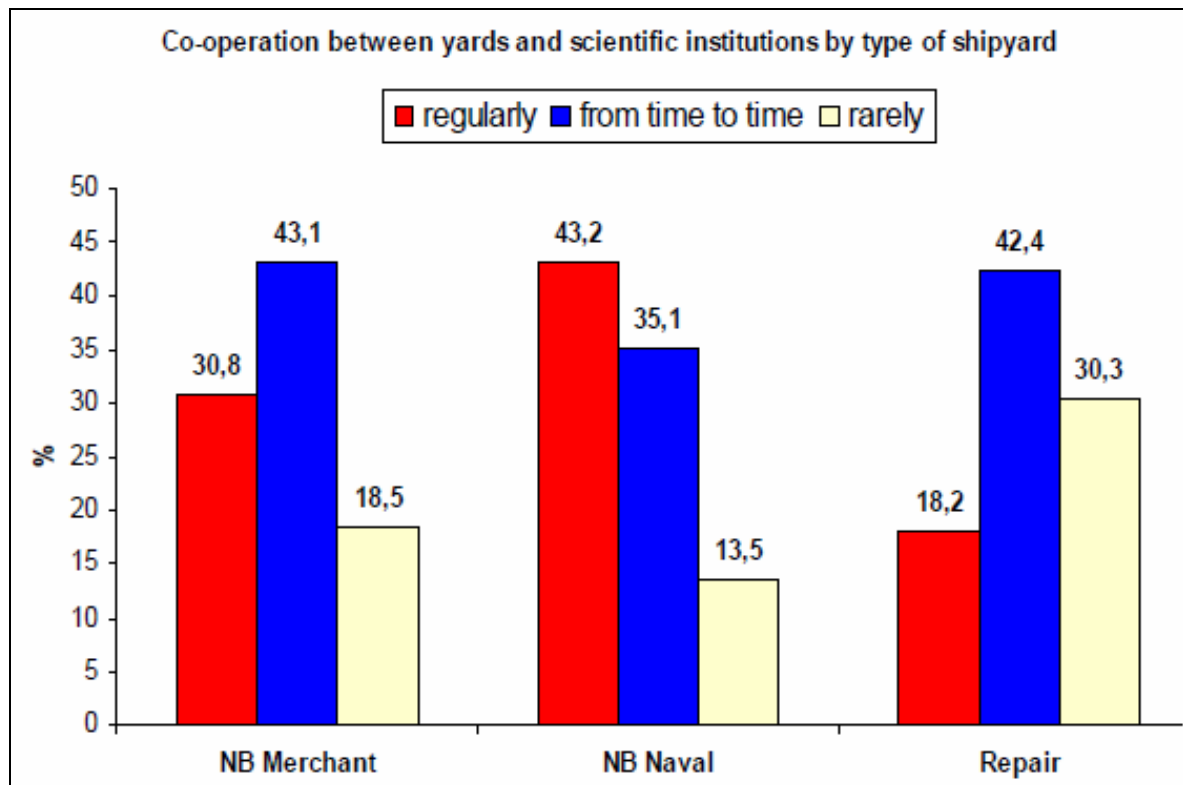


### VIII. Maritime Industry and Regional Development

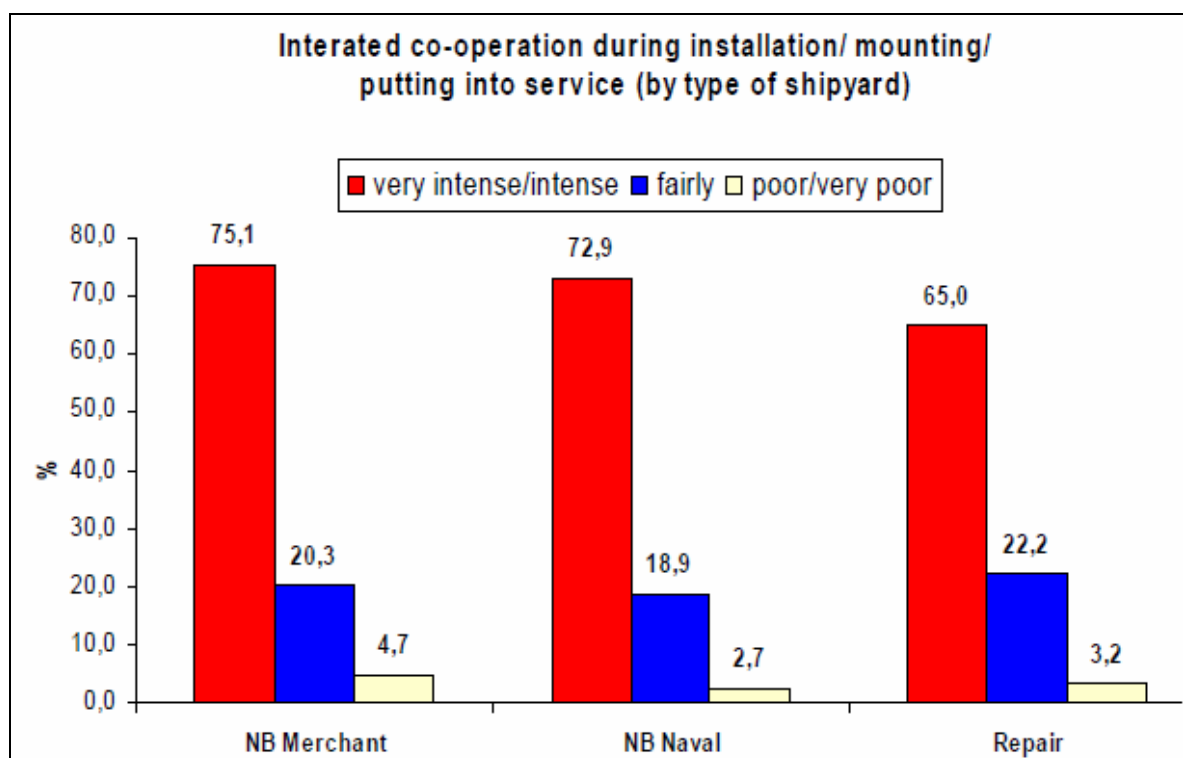
Until now the considerations have been focussed more on results from the logistics area. Now the regional development and networking situation in maritime industry will be more in the centre. In a European survey from 2005 the importance and the cooperation activities in the shipbuilding sector have been studied [TL]. The results of the survey stressed again the strong importance of the shipbuilding for the regional development of the involved regions. Especially the results for Germany showed that the socio-economic impact of the shipyards is crucial for their regions with a very high value of approx. 86%. One reason for this is that the yards are often structurally located in economically underdeveloped regions with a lack of comparable job opportunities. In the case of Mecklenburg-Vorpommern this situation applies for the whole region because, as already mentioned, the shipbuilding sector is representing the main industrial kernel with all its socio-economic implications.



In order to better understand the cooperation structures in the shipbuilding sector it is helpful to consider the networking activities inside the sector. By eliminating the interaction between the shipyards and scientific institutions it turned out that there are big differences according to the type of shipyards. The most intensive cooperation takes place in naval shipbuilding, followed by merchant shipyards, whereas in the case of repair yards the cooperation with scientific institutions has the lowest values.

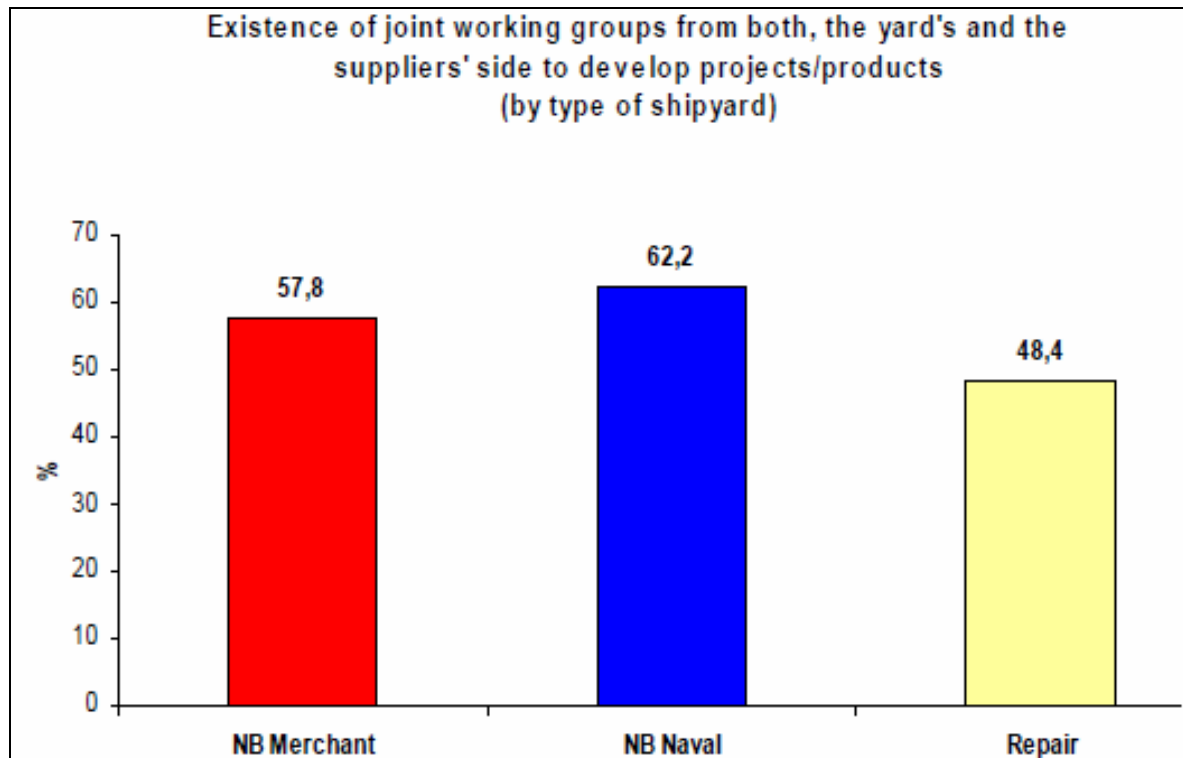


When it comes to the cooperation between yards and suppliers the situation looks totally different. This type of cooperation can be regarded as vertical co-operation expressing more the hierarchical type of cooperation due to the existing business relations. This type of cooperation applies to the design process, installation, mounting and putting into service. For all these types of yards-supplier cooperation the survey delivered comparable results.

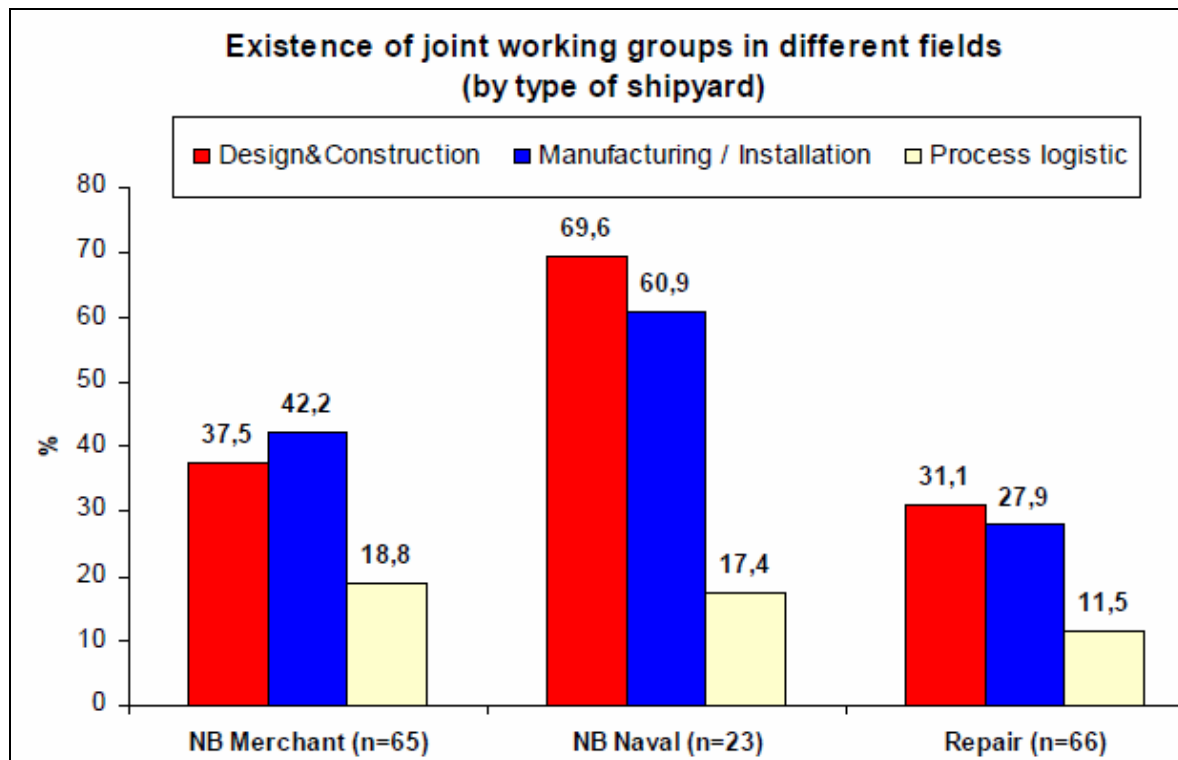




A deeper form of cooperation is represented by joint working groups between yards and suppliers. One result of the survey was that there is a positive correlation between the existence of such joint working groups and the complexity of ships built by the yard. This is the reason why in naval shipbuilding the value for existing joint working groups is the highest with 62%. In the field of merchant shipbuilding all yards involved in building passenger ships affirmed the existence of joint working groups. Even in the field of repair yards joint working groups can be found in approx. 50% of the cases.



The analysis of working areas for joint working groups between yards and their suppliers shows that design/construction and manufacturing/installation are by far the most important fields for this form of cooperation. There are huge potentials in the field of process logistics because this area is underrepresented in all kinds of shipyards:



The procurement and logistics field in shipbuilding has been identified also in other studies as an area with a huge rationalisation potential like shown in [TH]. When it comes to procurement strategies of yards the usual paradigm for supplier-customer relationships is still mostly the traditional confrontation model where long-term partnership and cooperation was often of secondary importance. For a long time the basis of the purchasing strategy was to encourage strong competition among many suppliers, combined with buying from several sources using short-term contracts. So operative and transaction oriented purchasing activities have dominated the purchasing departments in the European shipbuilding industry. This was especially true for mid-sized shipyards. A strategic approach in dealing with suppliers in the maritime industry – especially on the part of some larger shipyards – was only carried out in the last 10 to 15 years. Shipyards rarely use exactly the same suppliers for new shipbuilding projects. There are nearly no long-term contractual agreements for exclusive supply making it possible to change suppliers on daily basis [TH]. Nevertheless new integration projects between suppliers in shipyards have been initiated in recent years especially in German shipbuilding. Studies and expert interviews revealed the advantage of supplier involvement in German shipyards in cost improvement of more than 10%, a 20% reduction in cycle time, approx. 40% reduction in development time together with an approx. 15% higher quality.

The traditional supplier structures in the European maritime industry are characterised by considerable time and effort spent on coordination, a low level of transparency and deterioration of efficiency due to friction. In particular, the coordination and traceability of change notifications as well as an in-

ter-company revision control prove a challenge to shipbuilding companies due to incompatible systems and processes. So it is not a big surprise that a deeper cooperation between suppliers and shipyards is connected with different opinions on this topic mainly developed on experiences in the increased cooperation process. A summary of the fundamental problem fields stated from the perspective of shipyards are according to [TH]:

#### 1. Suppliers

- Fear of dependency from suppliers,
- Blocking due to fear of know-how drain or diffusion of proprietary knowledge and the relinquishing of technologies,
- Fear of losing confidential financial information: Prevention of the inspection of cost and profit structures (especially disclosure of capacity utilisation figures and actual man hour particulars).

#### 2. Shipyard

- Exit barriers and dependency on command of technologies of the supplier / lock-in in the supplier's technologies,
- Missing process for the involvement of suppliers,
- Problems of in-company cooperation between purchasing and development/production: Advantages cannot be sold internally ("not invented here" syndrome).

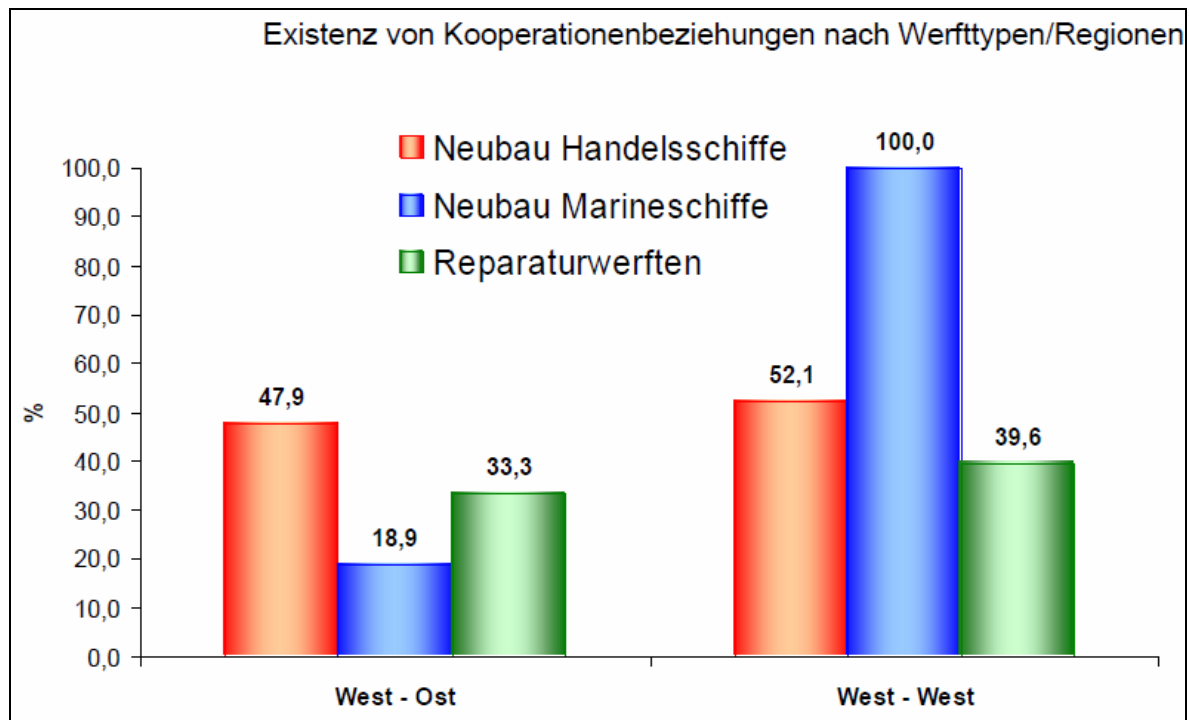
#### 3. Cooperation

- Language and cultural barriers as well as emotional problems in the deviation from traditional course of business,
- Initiation and implementation result in integration costs being too high (alternating control and coordination efforts; difficulties in measuring performance).

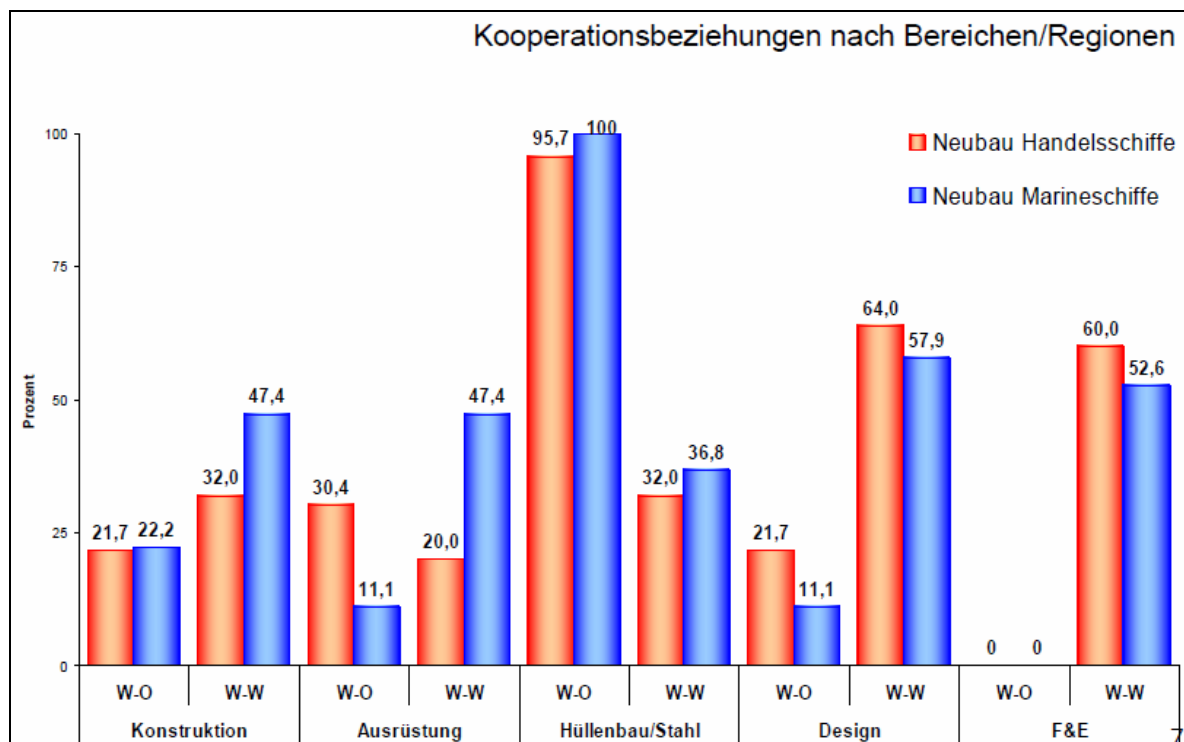
#### 4. Business and Regulatory Framework

- Unsettled legal implications and liability questions,
- Strongly fluctuating capacity figures of the maritime industry in general.

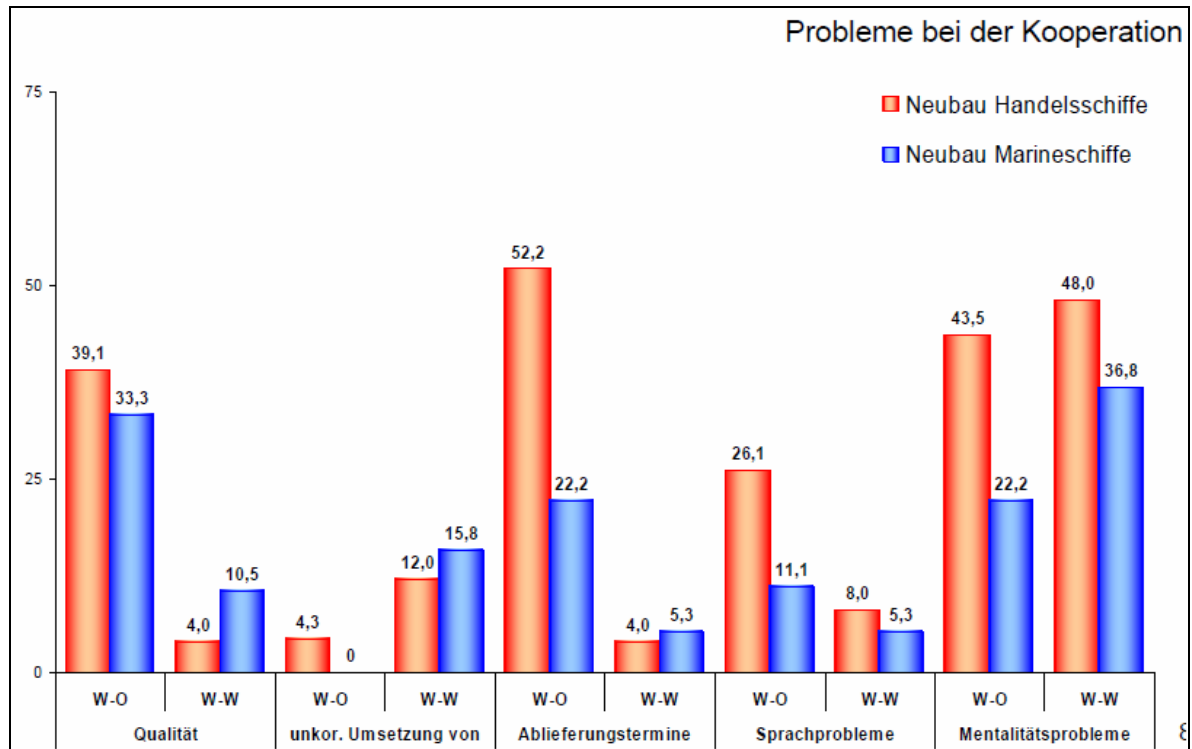
A special topic is the cooperation between yards which can be considered as horizontal cooperation. As already mentioned in the evaluation of the experiences of supplier/yard cooperation the mental and cultural differences are playing an important role for the success of the cooperation. These soft factors are even more crucial in horizontal cooperation than in the vertical case because shipyards are representing larger companies with their own traditions and working and management cultures. These cultural differences are increasing significantly when it comes to horizontal cooperation between Western and Eastern yards. Some results on horizontal cooperation can be found again in [TL].



The areas of existing cooperation can be found in the next table.

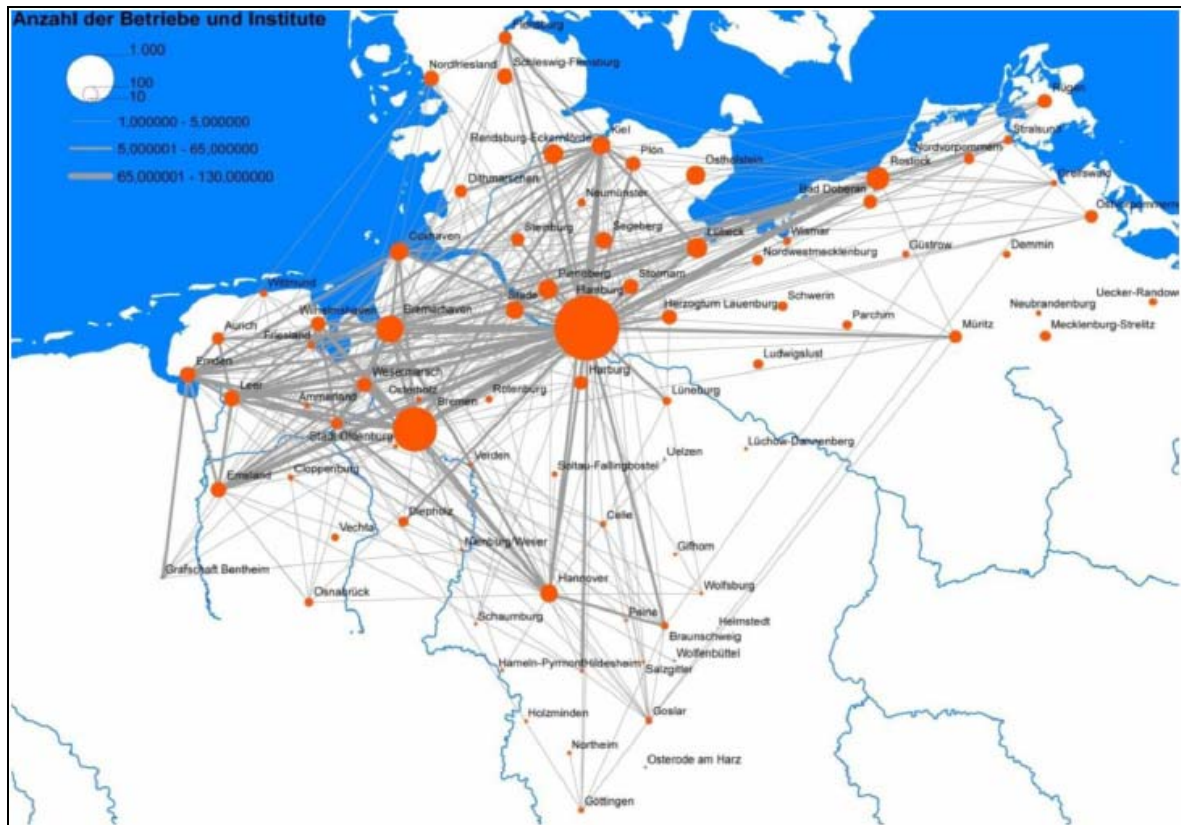


When it comes to the problems in cooperation it turns out that an incorrect execution of construction plans is of minor importance. The main problem fields are appearing in the fields of quality, time-related reliability, language problems and mentality differences stressing again the soft factors as crucial topics in horizontal cooperation.



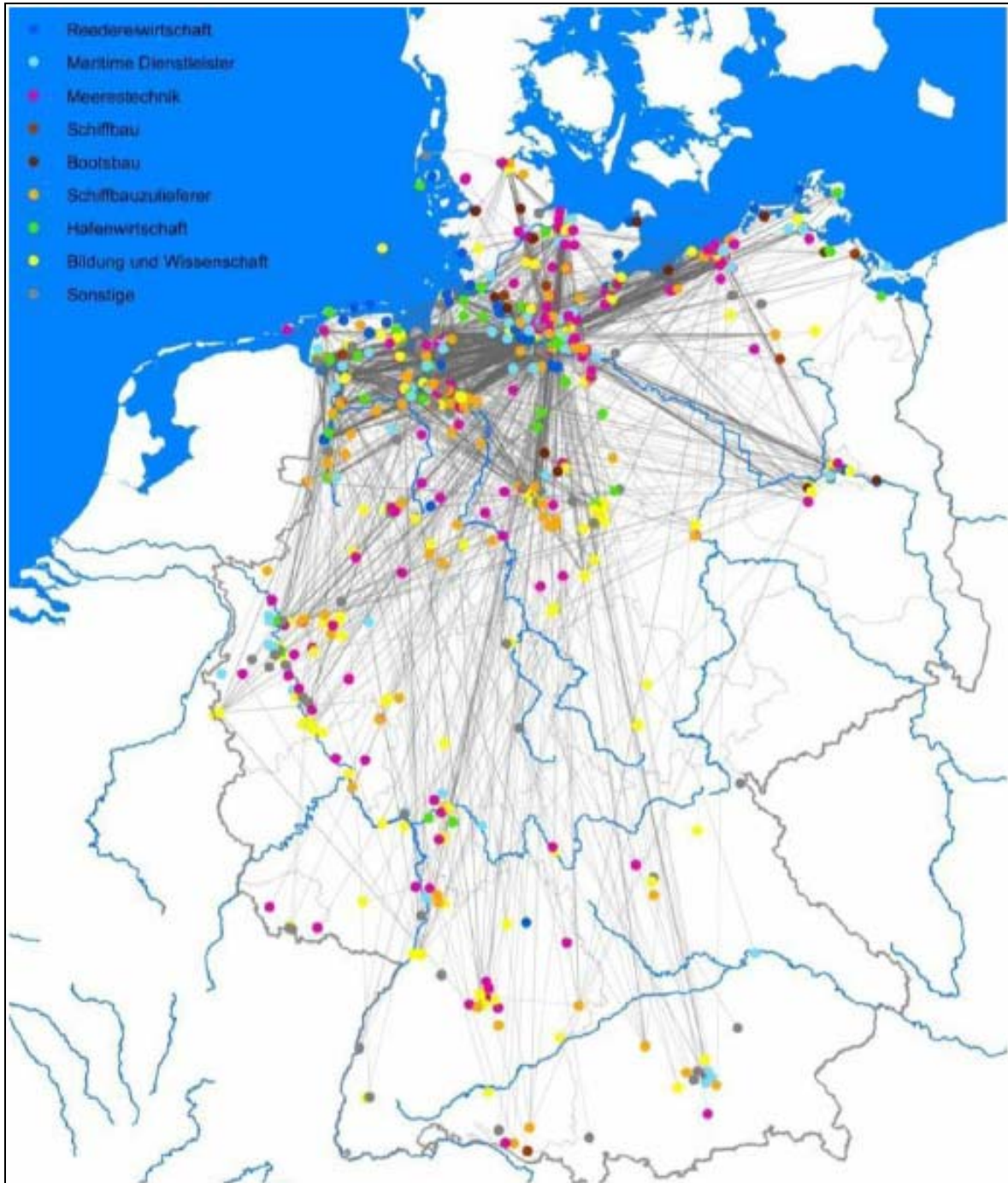
## IX. Maritime Network in Germany

In a special study the Northern German bank Nord/LG investigated the structure of the maritime network in Germany [NL]. The results are based on a survey about the cooperation relations among maritime institutions in Germany. The first chart is showing the situation in Northern Germany where it is visible that the center of maritime activities is located in Hamburg with a strong sub-center located in Bremen area. All other destinations in Germany are consisting of a significant lower concentration of maritime companies or institutions.



It is quite interesting to notice that a lot of maritime activities are taking place also outside Northern Germany which is revealed in the following chart:

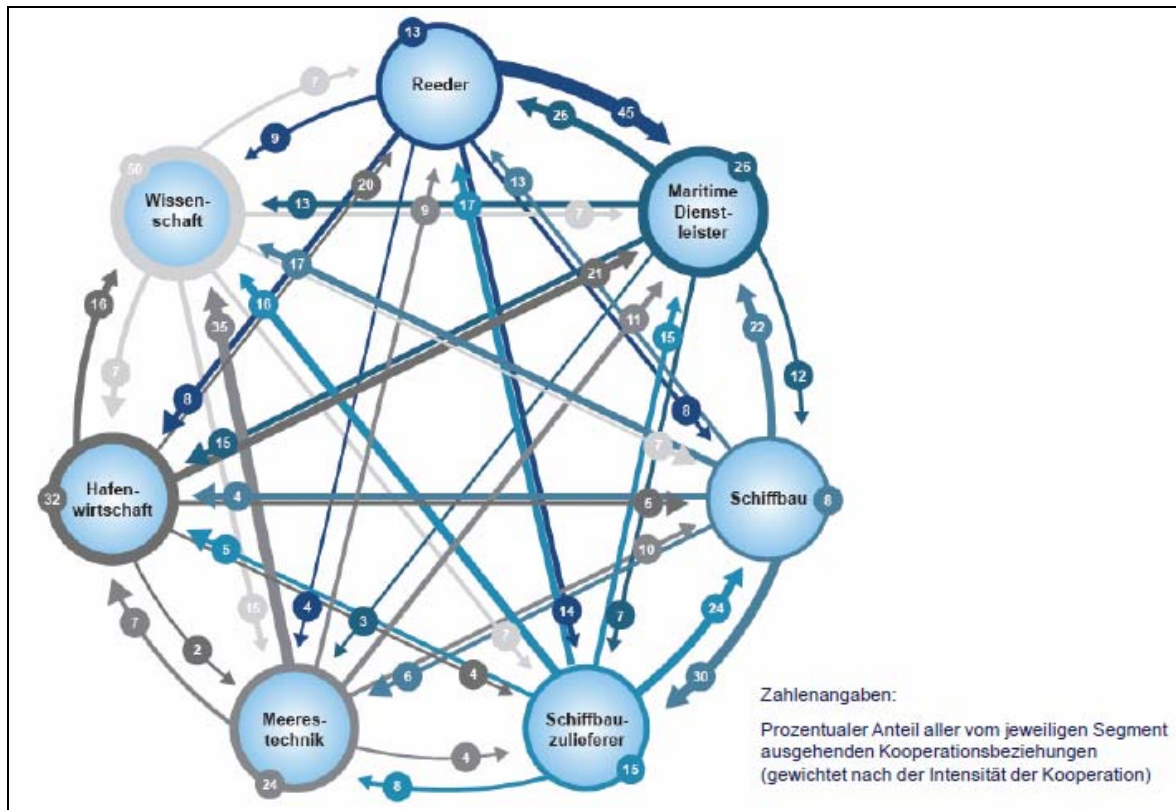




In both charts the lines between two points are representing cooperation between two institutions which have been investigated by a special survey. In both charts it is visible that concerning Mecklenburg-Vorpommern the most important point on the map is Rostock where most points and most of the lines are meeting. But compared to all important Northern German maritime areas it shows that not only the cooperation relations are on a relatively low level but also the number of actors in maritime sector in Mecklenburg-Vorpommern is relatively small, especially by keeping in mind that around 25% of shipbuilding capacity is concentrated in this region. Here again the low number of maritime supply companies is mainly responsible for the weak network structure in

Mecklenburg-Vorpommern.

The two presented charts do not give a hint how intensive the cooperation between the different actors in the maritime network is developed. This topic is visualised in the following graph:



The chart is revealing a lot of important relationships concerning the cooperation patterns in German maritime sector. So for example the high value sums between academic institutions and maritime technology, maritime supply companies and shipbuilding yards as well as the strong interaction between shipping companies and maritime service sector is not bearing a great surprise.

More interesting is the high cooperation level (31% = 17% + 14%) between shipping companies and maritime supply companies stressing another weak point in Mecklenburg-Vorpommern because not only the number of maritime supply companies in the region is with approx. 2% by far too low but also the number of shipping companies in Mecklenburg-Vorpommern is less than 3% of the total German value.

## X. Consequences for the Maritime Industry in Mecklenburg-Vorpommern

Mecklenburg-Vorpommern has no explicit shipbuilding cluster organization like other regions in Baltic Sea Region coordinating the activities and actors in the region. There are two initiatives, MAO and MAZA in form of associations where MAO (Maritime Allianz Ostseeregion, [www.mao-ev.de](http://www.mao-ev.de)) was founded as an interest and coordination association for a big maritime support and innovation project from German federal level played a strong role during the project



time till 2006 but lost more or less its coordination power after the project time. MAZA-MV (Kooperationsverbund Maritime Zulieferer Allianz MV, [www.maza-mv.de](http://www.maza-mv.de)) is more an umbrella and networking association of the maritime supply companies located in Mecklenburg-Vorpommern.

Both organizations are rather representing a weak political and economic power and especially a view on the MAO web-pages reveals that after the end of national granted R&D projects the activity level heavily reduced. One reason for this is that no substantial public financial support went into the shipbuilding sector but the other main reason was that the headquarters of all important shipbuilding yards in Mecklenburg-Vorpommern were shifted out of the region so the representatives of the yards were remote controlled from outside Mecklenburg-Vorpommern reducing the regional engagement. The situation of MAZA was different because the member companies were mainly regional SMEs with a strong linkage to the region but in comparison with the big shipyards they represented an association with a lower economic and political weight. Due to the low activity level in regional shipbuilding there are no significant activities of MAZA right now. Nevertheless it is important to mention that both MAO and MAZA are stressing their activities and links to off-shore renewable energy installations.

By taking under consideration the discussed results the following recommendations can be formulated:

- Cooperation and networking is generating strategic benefits,
- Successful cooperation and networking requires trust and transparency,
- Results of federal initiative “Kompetenznetze” shows that financial support and involvement of all regional key actors is necessary for sustainable success of networking activities,
- Maritime cluster institution is necessary which is equipped with a sustainable financing,
- Internationalization of network activities is substantial for long term success of networks,
- Future in maritime industry for Europe is lying in high-tech products so strong involvement of maritime R&D and innovation sector is necessary,
- Integrated maritime institute for Mecklenburg-Vorpommern, acting as a maritime cluster institution is recommendable, including all maritime industrial activities like maritime innovation and technology, maritime logistics and safety as well as maritime economy. This maritime institute has the additional task to formulate the regional needs in maritime industry due to the fact that the head quarters of the big shipbuilding yards are still outside Mecklenburg-Vorpommern.

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**Strategic Alliances in Maritime Industry - the Norwegian Experience****Abstract**

Norwegian shipbuilding firms face problems related to the high level of competition in the industry, uncertainty caused by industrial cyclicalities, and high cost levels. This study provides fresh insights surrounding how interfirm cooperative strategies selected by Norwegian shipbuilding firms can be leveraged to generate sustained competitive advantage. Advantages and disadvantages of interfirm collaboration are analyzed. The data were collected from semi-structured interviews, reports, and Internet. The paper would be interesting for practitioners and policy-makers seeking to improve competitiveness of national maritime firms.

**1. Introduction**

Analysis of previous studies (Benito *et al.*, 2003; Hervik and Jakobsen, 2001; Wergeland, 1999) has revealed that there is a lacuna of research relating to interfirm collaboration in the shipbuilding industry of Norway. These studies were general inquiries into shipbuilding in Norway, and they only briefly discussed the issues of interfirm collaboration. This study seeks to explore the phenomenon of interfirm collaboration in the context of the shipbuilding industry. The purpose of this research is to explore the strategies for interfirm collaboration reported by Norwegian shipbuilding firms. Presented evidence may be used by policy-makers and practitioners to guide their resource allocation decisions.

Today, approximately thirty countries have major shipbuilding industrial complexes (Wijlmost *et al.*, 1997). After 1975, the structure of the global shipbuilding industry changed dramatically. The centre of the world shipbuilding is now Asia. Japan, South Korea, China, and India are now the leading shipbuilders in terms of production volume. Western European shipyards have downsized and reduced their production capacities. They now employ fewer workers (Stopford, 1997). The market share generated by European shipyards has fallen from 49 per cent in 1977 to 23 per cent in 1995, and to 9 per cent in 2006 (R S Platou Shipbrokers AS, 2007; Stopford, 1997, 2009). In Sweden, Denmark and Great Britain, many shipbuilding yards have disappeared. Yards have closed due to low price competition from Asian shipbuilding firms, as well as the withdrawal of Government subsidies to shipbuilding firms. Nevertheless, the European maritime industry is still a strong player. The industry employs over 2.5 million people directly and indirectly and generates sales

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revenues of 111 billion euros (EUROMIND, 2008b). This study focuses on European shipbuilding, with reference to the Norwegian context.

The paper is structured as follows. The next section considers the issues facing the owners of shipbuilding firms in Norway. Then advantages and disadvantages of interfirm collaboration in shipbuilding are highlighted. Then the research method is presented. The findings of the study are presented in Section 6. Then conclusions and implications for practitioners and policy-makers are presented.

## **2. The Norwegian Maritime Context**

The maritime business is one of the most important economic activities in Norway. This cluster relates to shipping companies, ship consultants, shipyards, ship brokers, and ship service firms (Benito *et al.*, 2003). The Norwegian maritime cluster and energy cluster are viewed as two global leaders (Reve, 2008). Norwegian government policy seeks to enhance the importance of the maritime industry (NHD, 2007). The budget to strengthen innovation, competence development and research in the maritime industry has increased, and it equated to 252 million Norwegian kroner in 2008 (Marine Norway, 2007). Shipbuilding is a vital part of the maritime cluster. In 2009, there were twenty eight shipyards, and they employed approximately 37,000 people (Hervik *et al.*, 2009). The sales revenues generated by Norwegian shipyards related to approximately 11 billion Norwegian kroner in 2005 (NHD, 2007). Norwegian maritime firms specialize in the production of high-value added vessels. Over the last thirty years, the Norwegian shipbuilding industry has had to deal with structural changes, and it has adjusted to new market conditions.

Several problems confront Norwegian shipbuilding. There are general problems facing world shipbuilding. The main challenge is cyclicity in the shipbuilding industry (Volk, 1994). This cyclicity relates to uneven demand for new ships, fluctuating prices for ship construction, and general uncertainty in the industry. Further, this cyclicity can lead to skill shortages and other resource deficiencies in shipbuilding firms. Notably, there can be insufficient resources at the peak of the shipbuilding cycle and a surplus of resources during the trough of the cycle. Shipbuilding is still labour intensive and many young people do not want to join the industry. Throughout Europe, shipbuilding firms are dealing with an ageing workforce (Bruce and Garrard, 1999).

Norwegian shipbuilding firms face specific problems. The main problem is the threat of low-cost production by shipyards in Asia (Takla, 2007). To satisfy European Union (EU) competition policy, the Norwegian Government withdrew subsidies to Norwegian shipbuilding firms in 2000 (Lismoen, 2000). The issue of subsidies to shipbuilding firms is a topic of hot discussions in international organizations such as the Organisation of Economic Development and Cooperation (OECD) and the EU. EU competition policy suggests subsi-

dies to shipbuilders need to be phased-out completely. Governments that appreciate a world surplus of ship production are seeking to reduce subsidies that keep costly, inefficient and less competitive shipyards in business.

During the depression period in the shipbuilding industry between 2001 and 2003, Norwegian shipbuilding firms major sacked numerous qualified workers and engineers (Norwegian Maritime Industries, 2005). Owners of many shipyards, however, sought to preserve core competences relating to ship design, project management, organization, information and communication technologies, procurement and financing. During the recovery and peak phases in world shipbuilding between 2004 and 2008, Norwegian shipbuilding firms had to deal with skill shortages. This problem was solved with the help of international sub-contractors and the employment of foreign specialists. It seems that this trend of covering the human resource gap with foreign specialists will continue in the future (Norwegian Maritime Industries, 2005). Nevertheless, some Norwegian shipbuilding firms are still highly competitive and they have identified several niche markets in which they have a competitive advantage. Several strategies have been used to secure a competitive advantage. The first strategy relates to mergers and acquisitions. There is a clear trend towards consolidation within the Norwegian shipbuilding industry (e.g. Bergen Group, STX Europe, etc.). This strategy allows firms to externally acquire resources and competences. Some shipyards have adopted a differentiation strategy. They have identified and exploited new niches relating to the production and repair of oil rigs and offshore equipment. Some shipbuilding firms have switched completely to offshore production, while others have combined shipbuilding and offshore activities.

A cost reduction strategy has also been selected. Ship construction is a labour intensive process. The high labour costs in Norway (Takla, 2007) does not allow Norwegian shipbuilding firms to compete with Asian firms with regard to the production of dry bulk and crude-oil tankers, which are regarded as relatively simple vessels to construct. Norwegian firms can achieve significant cost reductions if they outsource hull production to low-cost countries in South, Central and Eastern Europe and Turkey. Hulls produced abroad can be outfitted by Norwegian yards. During the outfitting phase, Norwegian shipbuilding firms subcontract parts of ship construction to Polish, Lithuanian, Latvian, Bulgarian, and Romanian firms that construct vessels in Norway (Dagens Næringsliv, 2006).

Norwegian shipbuilding firms specialize in high-value added vessels, such as offshore ships (i.e. platform supply vessels, cable-layers and seismic ships), fishing boats, Ro-Ros, and chemical tankers. Innovative Norwegian firms can maintain a competitive advantage by leveraging the skills of shipowners, naval architects, suppliers, and competitors (Hervik *et al.*, 2009). Norwegian shipbuilding firms can enhance their competitive advantage by developing and leveraging interfirm collaborative relationships with firms located in Norway

and abroad.

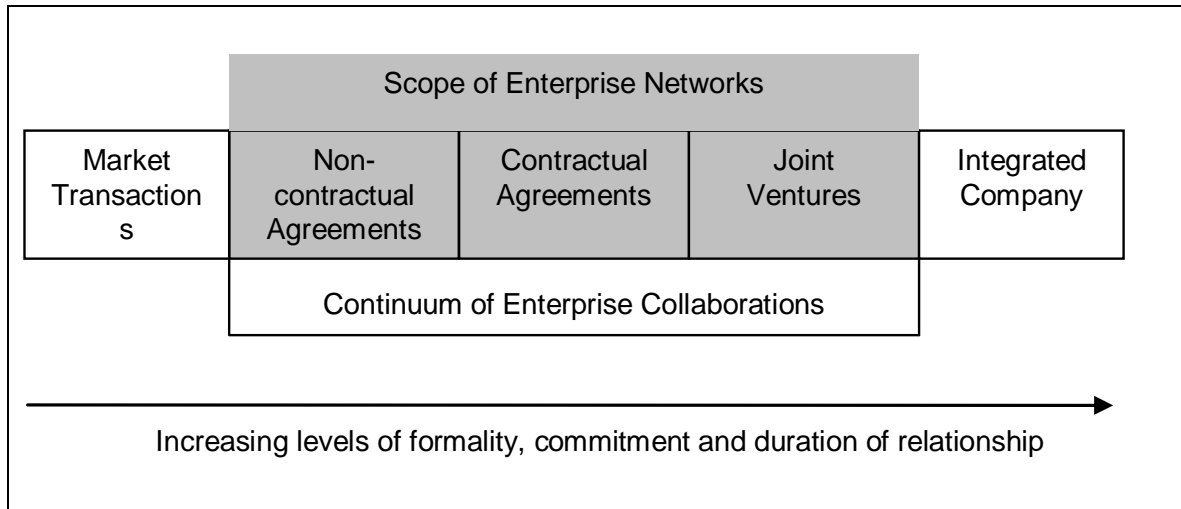
An industrial context can shape the nature of collaboration (Baum *et al.*, 2000). Hervik and Jakobsen (2001) studied relationships between actors in the Norwegian shipbuilding market. They found that the strongest collaborative relationships at the national level were between shipyards and ship equipment suppliers, and between shipyards and shipping companies. The shipping companies also had intense relationships with equipment suppliers. Ship consultants were found to be linked to shipowners, equipment producers and shipbuilders. Further advances in collaboration could enhance the competitive advantage of Norwegian shipbuilding firms. Wergeland (1999) pointed out that the competitive advantage of the Norwegian shipyards could be increased through cooperation with reference to technology investment and the supply chain.

### **3. Literature Overview**

There is a plethora of prior research focusing upon the classification of inter-firm collaboration agreements (Casson and Mol, 2006; Contractor and Lorange, 1988). Transaction-cost theories, for example, suggest that collaborative agreements are intermediate forms between market transactions and an integrated company (Williamson, 1975). The shaded area in Figure 1 comprises collaborative agreements. Interfirm collaborative agreements are often loosely labelled with the term ‘strategic alliances’. Strategic alliance is a form of inter-firm collaboration. Strategic alliances are viewed as “relatively enduring inter-firm cooperative arrangements that utilize resources and / or governance structures from autonomous organizations” (Inkpen, 1998: 69).

Interfirm collaborative agreements comprise a wide range of organizational forms from fairly simple contracts such as license agreements, long term customer-supplier agreements, technology share contracts, R&D partnerships to joint ventures where parties own stakes of a common legal entity. Alliances are a popular research topic in management research (Aggarwal and Hsu, 2009; Schilling, 2009). Parkhe (1991: 579) stressed that “[gaining] competitive advantage increasingly depends not only on a company’s internal capabilities, but also on the types of its alliances and the scope of its relationships with other companies”.

Figure 1: Continuum of enterprise collaborations



Source: Jagdev and Thoben (2001).

There is no widely used definition of strategic alliance. Nevertheless, scholars agree that the necessary condition is the preservation of participating firm's independence (Dussauge and Garrette, 1999). Teece (1992: 3) defined strategic alliances as "... agreements characterized by the commitment of two or more firms to reach a common goal entailing the pooling of their resources and activities".

#### 4. Advantages and Disadvantages of Interfirm Collaboration

Previous research has found that interfirm collaboration is associated with benefits and drawbacks for collaborators. Firms can learn from their collaboration partners. Learning may be a goal of a collaborative arrangement, or it may be a beneficial by-effect (Todeva and Knocke, 2005). Mowery *et al.* (1996) suggest that a strategic alliance is a channel for transferring and creating novel organizational capabilities. Equity-based alliances are viewed as being superior to contract-based alliances in terms of transfer of complex capabilities. Furthermore, successful knowledge management, cultural proximity between partners, alliance management skills, and learning can be generated by strategic alliances (Inkpen, 1998).

Firms engaged in interfirm collaboration can share complementary competences with their partners. Further, the partners may share resources. Combs and Ketchen (1999) argue that resource deficient firms engage in interfirm collaboration in order to gain access to critical resources (Lambe *et al.*, 2002).

Firms can reduce their risk exposure by developing interfirm collaborative relationships, particularly with regard to the generation and exploitation of novel technologies (Wildeman, 1998). Further, partners engaged in collaborative relationships can reduce their cost bases. Joint marketing agreements may enable collaborating firms to reduce their communication and advertising costs. Joint R&D is a mechanism to reduce costs related to the generation of

new innovations and new product development.

Interfirm cooperative arrangements can be associated with several drawbacks. Cooperative arrangements can fail to achieve their goals (Child *et al.*, 2005). Strategic alliances can be difficult to manage (Harrigan, 1988; Das and Teng, 2000). Coordination costs relating to the management of some types of strategic alliances can be high (Gulati, 1999).

Potential drawbacks might arise due to conflicts between the parties, which can be related to a lack of strategic fit, goal inconsistency, inter-organizational culture difference, and low level of coordination efficiency (Freiling, 2004). Risk is associated with all types of interfirm collaboration. Notably, partners might incur financial resource-deficiency and / or market opportunity risk (Child *et al.*, 2005). Participating firms bear a risk of partner opportunism (Das, 2004). Opportunistic behaviour is defined as “self-interest seeking with guile” (Williamson, 1975: 9). Collaborative partners might have different views and expectations on their own contribution, as well as their partners’ contribution. Firm managers might get upset when their partners violate the norms and the principle of reciprocity in strategic alliances (Todeva and Knocke, 2005). Additionally, the time used by top managers to negotiate and implement the alliance might be significant, a firm’s knowledge might leak to a partner, and some capabilities might atrophy (Day, 1995; Varadarajan and Cunningham, 1995).

Careful partner screening and selection can reduce the problem of opportunistic behaviour by a partner (Parkhe, 1993). Information and communication (ICT) tools can encourage management flexibility and efficiency (Xie and Johnston, 2004). Additional evidence is required surrounding methods of best and worst practice relating to collaborative partner selection, and subsequent collaborative behaviour by shipbuilding firms.

## **5. Method**

The unit of analysis in this study is a firm and an interfirm cooperative arrangement initiated by the shipbuilding firms. Semi-structured personal interviews were conducted with twenty-one owners, executives and managers of Norwegian, Polish and Ukrainian shipbuilding firms. Issues relating to the aims of joining cooperative agreements; resources and competences which shipbuilding firms and their collaborators contribute to joint ventures, strategic alliances, and other collaborative arrangements; and how collaborative strategies were related to the phase of the shipbuilding cycle were explored. Archival data and information from the Internet were also collected.

## **6. Findings: Special Features of Interfirm Collaboration in Norwegian Shipbuilding**

Shipbuilding firms (shipyards, ship design firms, and suppliers) collaborate with each other and they also collaborate with shipowners, financial institutions, and shipbrokers. Interfirm collaboration in shipbuilding can relate to



functional areas such as sales, marketing, production, engineering and technical support procurement, and financing (Table 1). Further, interfirm collaboration can be linked to issues associated with the production chain in shipbuilding, which is illustrated in Figure 2. The first stage relates to the concept and sales. Here, a shipowner might cooperate with a ship broker, a ship design firm and / or shipyards.

*Tab. 1: Interfirm collaboration in functional areas*

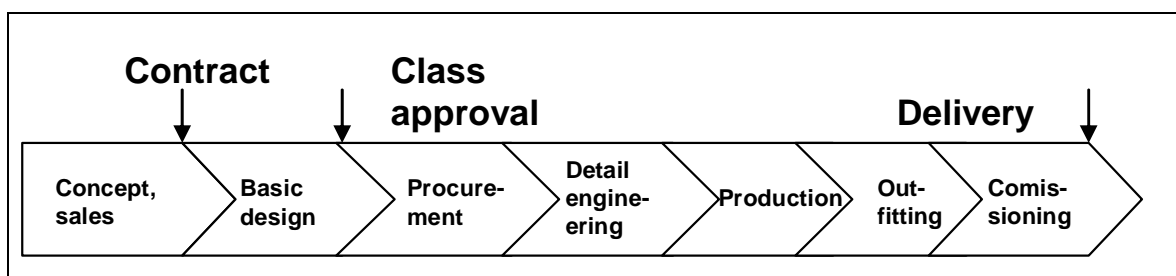
<i>Functional area</i>	<i>Nature of interfirm collaboration</i>
Sales	Cooperation between shipowners and shipbrokers in order to obtain new contracts. Market collaboration may be executed between a shipyard and its customers: shipping companies, shipbrokers, investors and government organizations.
Marketing	Joint marketing agreements.
Production	Alliances with subcontractors (e.g. metal cutting, hull production, welding, painting, and electrical installations).
Engineering and technical support	Interfirm collaboration in ship design, computer-aided design and computer-aided manufacturing with naval architect firms and ship consultants.
Procurement	Purchasing and material management are important vectors of shipyard's strategies because equipment, materials and subcontractor services constitute between sixty to eighty per cent of a shipyard's production costs (Bruce and Garrard, 1999). Collaboration in the procurement area may vary from very simple forms relating to long-term contracts to buy goods and services toward complicated forms relating to the outsourcing of parts production and joint new product development.
Financing	Different forms of collaboration relating to bank consortia (Stopford, 2009) and joint ventures between shipping companies, shipyards and ship design firms.
R&D	Joint R&D projects among shipowners, ship design firms, suppliers, shipyards and research institutions.

Source: By author.

Some shipowners have cooperative relationships with ship design firms and shipyards (Hervik et al., 2009). Collaboration might be informal or formal with reference to a joint venture. Shipyards might collaborate horizontally with reference to a joint marketing agreement, which shares the marketing costs. With reference to the basic design and detail engineering stages, collaboration between ship design firms, shipowners, suppliers of equipment and shipyards is realized. The third stage relates to procurement. The shipowners and suppliers cooperate with each other and develop joint R&D projects (Teng

and Das, 2007). Supplier alliances can become more popular (Kannan and Tan, 2004). Suppliers outsource production in order to reduce costs, enter new markets and / or to address resource and competence gaps. The next stages relates to fabrication and production. Here, both horizontal and vertical collaboration is realized. In Norway, hull production and outfitting is frequently performed by different shipyards. Usually hull shipyards and outfitting shipyards cooperate with each other through frame contracts to deliver specified amounts of tonnage (Solesvik, 2009). The hull shipyard might collaborate with its sub-contractors.

Figure 2: Production chain in the shipbuilding industry



Source: EUROMIND (2008a).

During the *outfitting* stage, an outfitting shipyard cooperates with suppliers of equipment and sub-contractors. Finally, during the *commissioning* stage, the ship systems are checked and tested before the vessel is delivered to the shipowner. With reference to each stage of the shipbuilding production chain, ICT solutions are applied to facilitate coordination between partners (EUROMIND, 2008b).

In order to secure a competitive advantage and to reduce the negative effects of shipbuilding cycles, Norwegian shipbuilding firms consider developing cooperative relationships with other firms. Some shipbuilding firms engage in collaboration proactively if their managers anticipate resource and competence shortages or surpluses with reference to the next phase in the shipbuilding cycle. This allows them to be engaged in cooperative arrangements earlier than other shipbuilding firms. These firms could potentially reap first-mover collaboration benefits. Proactive and reactive cooperative strategies are illustrated in Table 2.

Tab. 2: Description of cases

Case	Countries	Type of collaborative agreement	Number of interviews	Goals	Type of shipbuilding firm's strategy
A	Multinational shipbuilding group	International JV consisting of three shipyards in Germany and Ukraine	6	New market entry, securing of new orders	Proactive
B	Poland Norway	Frame shipbuilding contracts	3	To secure new orders	Defensive
C	Norway	Joint venture (between a shipyard, a ship design firm, and a shipping company)	3	Goals of shipyard and ship designer were to secure new orders. The aim of shipping company was to save costs on newbuildings	Defensive
D	Norway	Joint R&D between four firms	2	To develop new type of supply vessel using fuel cells	Defensive
E	Norway Ukraine	International joint venture	7	Joint venture between a Norwegian and Ukrainian shipyards and Norwegian painting firm to fill the competence gap in painting workshop	Proactive

Source: By author.

Interfirm collaboration can relate to mergers and acquisitions, market transactions, and internal development (Parkhe, 1993). Collaborative arrangements enable firms to reduce costs, to obtain new knowledge, and to secure a strong market position (Child *et al.*, 2005). In the uncertain shipbuilding industry, firms are forced to adapt quickly to changes in the environment and to changes in the demand for ships. It is often difficult for a firm to internally develop or purchase necessary resources and competences required to deal swiftly with changes (Burgers *et al.*, 1993). To ensure competitive advantage, some Nor-

wegian shipbuilding firms will select an interfirm cooperative strategy with other firms to ensure necessary resources and competences can be leveraged. Norwegian shipbuilding firms face problems related to the high level of competition in the industry, uncertainty caused by industrial cyclicity, and high cost levels.

## **7. Conclusions and Implications**

There are several important implications for owners of shipbuilding firms and practitioners from the shipbuilding industry which are interested in gaining and keeping competitive advantage and policy-makers, who are concerned with promoting Norwegian shipbuilding.

### *Implications for Owners of Shipbuilding Firms and Practitioners*

The findings of this study might be useful for practitioners to understand their alternatives and their tradeoffs from interfirm collaboration in shipbuilding. Practitioners in the maritime cluster include shipbuilding firm owners, shipowners, suppliers, shipbrokers, R&D and financial institutions, venture capitalists, insurance companies, shipping media, local maritime organizations, and educational institutions whose business activity is related to shipbuilding. Practitioners and shipbuilding firms' owners in Norway and Europe face competition from Japanese, South Korean, Chinese, and Indian shipyards. Furthermore, the Governments of these Asian countries provide substantial subsidies to shipbuilding firms. In contrast, Norwegian and other European shipbuilding firms get marginal financial support from the state. This makes competition in the international shipbuilding market even more difficult. Besides, the world shipbuilding industry faces the adverse influence of business cyclicity in an industry where periods of high demand for newbuildings change with the periods of low demand for new ships.

Norwegian and European shipyards are advised to utilize more effectively interfirm cooperation to compete with shipbuilding firms from the East. Executives of the shipbuilding firms should be aware of possibilities to smooth cyclicity in the industry by engagement to interfirm cooperation proactively. The benefits of interfirm cooperation are straightforward. However, managers and owners of shipbuilding firms should be conscious that engagement into interfirm cooperation might decrease independence of the firms. Some shipbuilding firms mastered interfirm collaborative strategies to manage negative consequences of the shipbuilding cycle. They proactively engage in collaborative relations in order to provide new contracts and get necessary resources and competences.

Moreover, the results suggest that practitioners in shipbuilding industry and owners of shipbuilding firms should consider carefully their interfirm collaborative strategies. Depending on the phase of the shipbuilding cycle, as well as current and future resource and competence needs, practitioners and shipbuilding firm owners employ different strategies.

Shipbuilding firm owners and managers willing to benefit from interfirm collaboration should build and leverage alliance competence. Skills and competences are necessary to manage strategic alliances and to select the right partners.

### *Implications for Policy-Makers*

Several issues are facing Norwegian shipbuilding firms. Norwegian shipbuilders work in the niche markets of specialized vessels such as fishing vessels, offshore ships, research vessels, ferries, and chemical tankers. However, the competing shipbuilding firms from the low-cost countries penetrate some of these niche markets as well, attracting customers with lower prices for new-buildings.

Another important issue surrounding competitive activity between the Asian and European shipbuilding firms is government subsidies. The policy of the European Union/European Economic Area is straightforward – shipbuilding firms shall be marginally subsidized. The ceiling for state aid is limited to 9% for a large vessel of over EUR 10 million of value, and 4.5% for smaller vessels which value is under this amount (GIEK, 2009). At the same time, government aid is a popular tool of Asian (especially South Korean and Chinese) policy-makers who aim at winning a competitive game against other national shipbuilding firms. Another barrier is the large degree of domestic competition among the shipbuilding firms.

Policy-makers in Norway are concerned with the further promotion of the Norwegian shipbuilding industry and keeping competitive advantage of the national shipbuilding. Shipbuilding provides jobs for populations and contributes to a country's economic development. Several programs currently assist shipbuilding firms, such as MAROFF and MARUT. These support programs were established in order to support core competences of the Norwegian shipyards in innovative design, finance, project management, organization, information and communication technologies, procurement and financing (Forskningsrådet, 2009; Marut, 2009). MARUT and MAROFF programs support cooperation between research institutions and shipbuilding firms in new product development: in other words, support R&D cooperation. This was made with the aim to move away from the subsidiary nature of state support, which contradicted the European Union policy to support indirect methods of aid aimed at competence and innovation development. The Norwegian state provides also financial support of shipbuilding firms through the Guarantee Institute for Export Credits (GIEK). GIEK is a governmental guarantee organization which supports the shipbuilding industry through several schemes. One of such schemes is a building loan guarantee for shipbuilding industry where GIEK shares up to 50 per cent of the risk of the building loan bank (GIEK, 2009).

Consequently, the findings of this paper have important implications for

policy-makers. First, people who promote development of Norwegian shipbuilding shall take into consideration benefits of cooperative strategies. A number of initiatives can be directed to support interfirm collaboration of the shipbuilding firms with shipowners, suppliers of ship equipment, ship designers, and shipyards.

Second, support programs should be developed with regard to the phases of the shipbuilding cycle. This study revealed that resource and competence needs of the shipbuilding firms are different during various phases of the shipbuilding cycle. Consequently, the nature of the government support required for shipbuilding firms is dynamic.

Third, this research demonstrates that one of the key objectives of policy measures is to address competence development in the shipbuilding firms, including alliance and outsourcing competences. A possible step of policy-makers is to promote interfirm cooperation within existing maritime networks which are quite popular in Norway. Furthermore, interfirm cooperation might be stimulated on international level by encouraging cooperation with foreign firms. Policy-makers have acknowledged that information and communication technology competences and resources facilitate intra-firm and interfirm cooperation (EUROMIND, 2008a). Policy-makers may need to take steps to develop ICT competences of Norwegian shipbuilders.

Generally, support programs in Norway are not industry specific. The exceptions are agriculture and the shipbuilding industry. Governmental programs might consider ordering research and navy ships from the Norwegian shipbuilding firms during the trough and recession phases. Policy-makers and business development agents might consider using temporary negative resources and competences which shipyards have during the trough and recession phases in other sectors. However, practitioners and policy-makers should acknowledge that resources and competences may be context dependent. Thus, their competences and resource base cannot easily be applied in other sectors.

This study has revealed that Norwegian shipbuilding firms collaborate with foreign shipbuilders. Such interfirm collaboration has different motives. On the one hand, Norwegian shipbuilding firms establish strategic alliances with the shipbuilding firms from low-cost countries in order to reduce costs. On the other hand, Norwegian shipbuilders cooperate with the advanced shipbuilding firms and the shipowners to create innovative ships and products. This suggests that policy efforts to support interfirm collaboration should take these differences into account. Finally, Norwegian shipbuilding firms are not a heterogeneous group. The size of the shipbuilding firms varies from the middle-sized shipbuilding firms and groups to the small-sized shipbuilding firms. Policy-makers should acknowledge that initiatives promoting collaboration between different target partners should be different.

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## **On the Editor**

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