

# **Experimental Danish Dancers on the Global Dancing-floor.**

**Draft – not for quotation**

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## Foreword/Abstract

In all the developed countries, firms, in order to find a new place in constantly changing global value chains, have been experimenting with re-engineering, downsizing and outsourcing – searching through a variety of new organizational concepts to create the ability to continuous change. This article is an exploration of processes of organizational and institutional experimentation in Denmark. We argue that not only companies are experimenting with new organizational principles (lean production, socio technical systems and learning organization), but also citizens are experimenting with new forms of family life, working-careers and professional identities creating new paths and new possibilities of development. The efforts to increase flexibility are strongly linked to the possibilities for continually redefining organizational roles within and outside the boundaries of firms. Role-redefinition is an ongoing mutual process – like complex dancing patterns – where participants align their actions together, at both national and international levels. Such mutual role definitions depart from the institutional setting concerning the original identity of the potential partners and the rules followed in the patterned interaction by which a new pattern of interaction is created. Only if this process allows for simultaneous mutual redefinition of roles, patterns of interaction and the use the dancing partners make of institutions can they fully exploit the options that the global dancing floor offers. These possibilities are linked to a diversity of institutional experiments located at the boundaries between citizens, firms, and institutions.

Our paper progresses in three steps. First chapter is devoted to a more generalized characterization of the systematic pattern of the Danish Business System, and, secondly, how citizens, firms, and institutions have at an aggregate level been aligning themselves to the global setting, and its possibilities and challenges. Second chapter, is devoted to micro-investigations of how the mutual role-shifts are occurring in case-firms and towards their institutional setting in their attempts to define for themselves a place or make use of the global dancing floor and engage in transnational exchange with potential partners. In presenting our cases, we discuss the new forms of industrial organization and how they are linked to participation and partnership, how they mutually govern their experimental steps, as well as the possibilities and challenges associated with them. We will discuss the processes of collaboration between actors, teams and communities of teams, debunking how teams are formed and broken in a processes of reflexivity, based on collaboration and competition, with groups inside and outside the boundaries of firms and nations. The article examines how groups challenge each other, their own models and imported recipes, but also how they negotiate new patterns of interaction, during the process of experimenting with new organizational principles. We discuss the problems that firms and actors face, the preliminary solutions they have been able to develop, how these solutions influence the different positions and movements that ambiguously divide and unify employees, managers and representatives. Third chapter, is first an attempt to synthesize the Danish pattern of continuous adaptation, and the, secondly, takes a comparative perspective and assess how Danish dancers compare to dancers from other institutional settings, in particular the other Nordic countries, which currently seems to make the fullest use of the Dancing floor (according to the latest ranking of dancing from the World Economic Forum).

Rather than a finished text, this document provides elements to a work in progress. It is a preparation of the Danish contribution to the Translearn project. Theories of innovation, the novel role of the welfare state and a characterization of the change going on internationally will be written in a general introductory chapter that frames the content of what follows.

## **1.0. Introduction to the Danish case**

### **1.1. Denmark – An experimental laboratory for an alternative route to the New, Knowledge Economy?**

Danish firms - small, often family owned with low R&D - and regions have not entered the new global economy as expectations predict (as in e.g. the US, Finland, etc., innovating in high-tech innovative sectors) and leading to a uniform version of the knowledge economy. In 1995-1999 the contribution to growth in total employment of the rise in knowledge-intensive employment was 4.9 for Finland, while it was only 1.0 for Denmark (Arnal et al. 2001, p 17). Yet the 1990s “employment miracle” rated Denmark among the top of EU countries concerning the ability to move to low unemployment rates (Madsen, 1999, 2003). Not a coherent transformation, but a patchwork of factors and labor market reforms combine to explain this development (Madsen and Pedersen, 2003). Some regions moved towards more knowledge intensive, though not necessarily high-tech occupations (e.g. Herning-Ikast; North-Jutland), but it was striking that the employment of formally unskilled workers and their average wage-increases were higher than in most countries, making Denmark more egalitarian, while others changed towards a more dualistic labor market (Andersen, 2003).

Danish flexicurity has been seen as one phenomenon explaining Denmark’s indigenous transformation towards the new global economy. It has been said that the ease by which employers can hire and fire workers makes the economy much more adaptable and able to shift resources to progressing firms and reducing employment in shrinking ones. On the other hand generous social security, unemployment benefits, active labour market policies and personalized public services ease periods of unemployment for the involved families and make it possible to continue living a fairly normal life, while searching for new employment or learning to master a new job (references on Danish Flexicurity).

Now the attraction with this view is that it combines the flexibility of markets with the “European Social Model”, and it is easy to see why flexicurity may be beneficial for firms living in the new economy. Since the mid-1990s the rule of thumb has been that in Denmark 250.000 jobs gets lost, while 260-270.000 new are created and approximately 20% of the labour force shift jobs, yearly. In an economy of the Danish size, this is witnessing of a dramatic pace of change. Very few, if any, have seriously studied what is going on, how the processes look and why it happens. Moreover, very few are able to tell why this would mean progress towards the knowledge economy in a distinct way. But it seems to do, as Denmark has progressed to a higher ranking in the Lisbon Scorecards than even the US (World Economic Forum, 2004).

But it makes indeed sense if we see it as reflection of larger global tendencies. For Herrigel (2007), one of the central phenomena of the new economy is that firms constantly must redefine their role towards other firms in order to reduce costs in order to finance increasing innovativeness. This involves finding new markets, out sourcing, creation of new partnerships, presence in different localities with different skills and knowledge, etc. and the more relations that are created, globally the more possibilities for offensive redefinitions of the role of the company are possible. Now, Denmark may be scoring low in investments in R&D, involvement in high-tech-sectors, etc (Benner, 2003), but it might score high on the ability to role redefinition. External role-redefinitions of firms involves changes in the internal skill- and role matrix of the company, leading either to lay-offs, hiring of new workers with different skills or

radically shifts, re-skilling and re-combinations of workers within the company. Obviously, Danish flexicurity could be a very attractive asset under such conditions (Hage and Powers, 1992).

Furthermore, as employees by shifting jobs frequently learn to master an increasing number of roles and skills, their role-set and competencies increases, making them increasingly equipped with the ability to change role- and reflect on deliberative role-taking and the construction of new role-matrices in both teams and the larger organizations in which they work. Compared with the *Bureaucratic character*, which cultivated a more and more specialized and corporation specific competence, this new situation creates an *Interactive social character* that is better able at shifting between than of perfecting routines (Macoby, 2006), and better prepared for search (Sabel, 2006).

As Sabel has pointed out (Ibid), we are badly prepared for understanding this novel form of firm, and if Herrigel is right in his description of the continuous redefinition of roles among firms, we are also in trouble concerning the understanding of institutions, as our theoretical frames for understanding roles and rules has been modeled for stable states. And as Herrigel (Ibid) rightly has pointed out role- and rules must change interdependently, and so must the use made of institutions. Obviously, this raises a whole set of new questions of governance: How are firms governed that make constant role-redefinitions and alters constantly departmental division of labor? How is labour markets governed if employees transcend the boundaries of professional groupings and trade unions? How may institutions change with shifting needs in firms and employee groupings, without leading to abuse of public means?

We will probably not be able to answer these questions, but we think Denmark is an ideal laboratory to explore these issues empirically to create substance that may lead to answers.

However, whereas the discussion on flexicurity is basically going on among macroeconomists and the debate on global restructuring is held in universal tones, what we need for our purposes is to understand the processes of micro-dynamics both within and among firms, worker-careers, and the role played by institutions. Thus we start this paper, by reviewing how earlier research on the Danish business system has modeled firm- and labour-market dynamics and their institutional settings and on top of this we attempt for broad characterizations on how this system has evolved. Then in section 2, we study in dept a number of firms and their way of coping with globalization in particular by developing new forms of learning organizations and how they have made use of institutions in a number of very different ways. In section three, we first synthesize how firms and institutions co-construct an evolutionary dynamic incorporating the complementarities between national institutions and local firms and finally we characterize the Danish dynamic viz a viz other Nordic countries.

## **1.2. The traditional internal dynamics of the Danish business System**

If aspiring for an understanding of the Danish Business System, one major flaw in the discussions on Danish flexicurity is that it attributes the active role to employers, while it assigns to employees a passive, in which they accept to get easily fired in exchange of generous unemployment benefits, and by accepting to take on new job-roles. In what follows we shall see that traditionally and recently mechanisms of role-redefinitions spring as much from employee groupings' aspirations, fight for social space and reputation, mediated by the institutions they make use of and exercised through holding jobs

in firms, which they co-construct with employers. In other words we want to understand the comprehensive dynamic on the labour market and among business firms, so that the past pattern of mutual role-taking among firms and employee-groupings become clear and is able to replace the general market-reasoning behind flexicurity arguments with a socio-economic and institutional understanding of patterns of interaction.

Such an investigation calls for an understanding of the distinct historical construction of Danish industrialization, but here we shall limit ourselves to what in particular is important for the above mentioned dynamic of role-taking. For various reasons, the crafts and craftsmen won a particular strong position in Danish industrialization compared with most other countries, which helped to give SMEs and craft workers a much stronger role in Denmark compared to other countries. The way they defended this position was not by creating a political coalition as in the case of Germany, where *der Mittelstand* owed its position to Bismarck (Streeck, 1992). In Denmark it played a cardinal role that the crafts by the late 19<sup>th</sup> century succeeded in creating numerous local (multi-craft) technical schools associated to national craft-specialized schools, so that an extreme decentralized labour-market could be linked to general and certified curricula that made national mobility of the workforce possible. From the beginning of the 20<sup>th</sup> century this school system was crowned by a Technological Institute experimenting with new technologies so they could be applied for small businesses and constantly developing new curricula for existing crafts and developing new craft-specialization (e.g electricians, car mechanics, etc) in tune with new technologies and needs. Firstly, this meant that craft-workers came to dominate industrialization as their numbers expanded explosively and that they lastingly came to dominate the entrepreneurial class. Second, other groupings had to waver for a training strategy if they wanted to compete for social space within industry against the craft workers.

For instance, during the crisis of the 1930s unskilled workers initiated Work-technical-schools organizing evening classes that attempted to educate unskilled workers in new technology-areas so that they could better compete with skilled workers over jobs that had not already been fully colonized by the skilled. Gradually, the unskilled succeeded in gaining increasing state support and from the 1960s onwards they were able to create a countrywide system of Special-worker-schools that could organize curricula and compete more fully with the craft-workers' Technical School – and unskilled workers changed their unions to the Union of Specialized Workers. During the same period, the craft workers were absolutely not passive. On the contrary they tried to contest the Civil-engineers by flocking to Technicum-engineering-schools, that had been initiated by visionary entrepreneurs originating from their rank and file. Through these schools and new vocational training for technicians at Technical Schools, the skilled workers totally came to dominate the new positions and organizational roles that opened up with Denmark's modernization after Fordist ideals after WW2. Thus by the 1960's different groupings in Denmark were organized in different unions, associated to different schools, all engaged into a rivalry of qualifying their constituencies to whatever openings would show up on the labour market with new technologies, new organizational forms, etc. This rivalry even involved different Ministries, as e.g. Specialized-Workers-Schools were the responsibility of the Ministry of Labour, while Technical Schools belonged to the Ministry of Education. One could say that the universal weapon for fighting for social space in a civilized way in Denmark became schools, and unions could only expand if they secured that their members and associated schools managed to capture expansive new areas that would open up with changing technologies, forms of organization, etc. (Kristensen and Sabel, 1997).

This dynamic have had an immense importance for the distinct Danish economic and social dynamic. In Kristensen (1996) we have at greater length described how this system pressurized firms to compete over reputation by trying to recruit highly recognized teams of workers and offer them job-challenges so that they would not need to pursue their craft worker career (Sabel 1982) of continuous growth in skills by shifting employer<sup>1</sup>. One might say that workers have tried to and in many cases managed to succeed in institutionalizing poaching, without creating the consequences that employers would underinvest in vocational training and education, as the welfare state increasingly carried the financial burden associated with an increasingly sophisticated system. Rivalry over recruitment of highly skilled and reputed workers was very difficult for firm that would cater for mass-production of a few products and therefore a fairly unusual firm type, the *skill-container*, specializing in mastering a number of technological processes for a multiplicity of purposes, became constitutive for the Danish Business System. Given a dense network of skill-container-firms it became increasingly easy to operate another form of firm, which have called the *project-coordinator*, because it could easily organize a project of developing, producing and marketing a new single product on an international scale by asking skill-containers to do most of the development and production and then eventually focus on assembly and marketing at home. In this way it became very easy and cheap in terms of investments to bring new products to the market, or to cultivate services, where most of the value-chain were outsourced to other firms.

One of the reasons that a business system of skill-containers and project-coordinators do not simply develop into a hierarchical system of OEMs and suppliers, as for instance in Japan, is that skill-containers will loose their gain in recruiting power by specializing into a narrow supplier of repetitive blanks. In Denmark it is a widely recognized rule of thumb, an informal governance principle, that a supplier should never put more than one third of its turnover into one basket. This means that successful project-coordinators will quickly outgrow Danish suppliers and therefore have – fairly regularly since the 1960s –outsourced production of standardized, mature pieces to foreign suppliers, while on the other hand used Danish suppliers for experimental development of new pieces and products. Skill-containers, on the other hand, has been tied up into many different value chains, some regional, others national but increasingly also since the early 1990s international. The implication is that new challenges have automatically entered their workshops helping them to offer highly skilled teams of workers with an abundance of new opportunities for experimental learning.

However, these firm types are or were seldom found in clean forms. Most are mixtures of both principles. For instance, a skill-container often develop some sort of product and a market because it wants to do something which can stabilize employment, at least so it can employ the core group of its working teams during slumps. But it may also develop a product to be able to network with potential customers for its wider skill-container services<sup>2</sup>. In a similar manner project-coordinators may want to control assembly and some core parts to secure control of quality. In this way the two types of firms may gradually start to embody both logics within their realm, creating very complicated and self-

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<sup>1</sup> It is interesting to observe that in the Danish case workers have been reluctant to have mutually binding laws on employment protection as craft-workers always tried to protect their crafts by being highly mobile. Thus during early industrialization journeymen would discriminate against colleagues that had married and in this way given up their mobility. For the same reason workers – though not their unions – were against co-ownership reforms in the late 1970s from fear that it would tie them too closely to a single employer. Many small stories on the labour market is about conflicts and strikes if groupings of employers tried to make agreements against poaching, as that was seen as a return to feudalism by workers.

<sup>2</sup> One of the difficulties of being a skill-container is that the ”products you have produced for customers are exactly the kind of products you cannot produce for new customers”, whichh make it difficult to participate in industrial fairs, etc.

contradictory evolutionary paths but also highly interesting forms of industrial firms that may be highly networked with many outside firms.

Danish factories – as their Nordic sisters - looked very different from factories in most other countries. Already by the end of the 1970s. As shown by Dobbin et al (1999: 277) factories in the Nordic countries, and in Denmark in particular, were characterized by high discretion in work compared to Anglo-Saxon countries. A Danish blue collar worker experienced as much autonomy as did a foreman in the US; a Danish production-manager was more autonomous than an American CEO (while a Danish CEO experienced less autonomy than a Danish foreman). Different explanations may be given for this situation. E.g. Morgan (1997) shows how the universalistic welfare state gives rights and privileges to workers that are not associated to the employment contract as they tend to be in both Anglo-Saxon and in continental, conservative welfare states. In this way, workers are more free to search for a new job, if dissatisfied with the current employer, in universalistic welfare states because they risk not also jeopardize pensions, health insurance, etc. In Denmark, where the autonomy according to Dobbin et al is the highest, the training system helps make frequent job changes easy, as the training system could be said to share the risk of job-change with the employee, and eventually turns such periods into investments in and increase of human capital.

According to Eriksson et al (2006: 104) most employees leaves a job in exchange for a new. Even during period of high unemployment, say 1980, this number amounted to 200.000 whereas only 80.000 were fired and went into unemployment. In periods of low unemployment, say 2000, approximately 260.000 left a job because they had found a new, while only 40.000 were fired to unemployment. Thus, Danish *flexicurity* is to a great extent characterized by employees looking for new challenges in other places<sup>3</sup>. Consequently, employees rather than employers are the active agent, and they in turn pressurizes employers to offer new opportunities for increasing skills and developing new role configurations that look challenging in the eyes of employees.

The self-imposed horizontal mobility on the labour market, in Denmark, also created a hierarchical, class transcending mobility. Haldor Byrkjeflot (2001) has brought together a number of comparative studies of the social origin of CEOs in different countries by the end of the 1960s – when Fordism was thought to rule manufacturing industry<sup>4</sup> - and differences in class-origin of managers among countries are indeed astonishing:

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<sup>3</sup> Jeg har set opgørelser, der viser, at i højkonjunkturerne skulle 2/3 der forlader et arbejdssted gøre det for at søge nye eller større udfordringer. Desværre har jeg ikke fundet kilden. Der skulle være et studie på vej fra Århus med Nicolai Kristensen og Niels Westergård-Nielsen. Husk at checke dette.

<sup>4</sup> Byrkjeflot (2001, note 15) writes: The European part of the survey was based on responses from the Chief Executive Officers (CEOs) of the largest 500 international companies in Great Britain, France, Germany, Italy and Sweden, the 400 largest in Denmark, Finland and Norway and the 250 largest in Belgium and the Netherlands.

**Table 1.1 : The Social Background of CEOs around 1970**

Country	From lower classes	From Middle-class	From Upper-class
Denmark*	16	36	48
Finland	10	23	67
Norway	4	19	77
Sweden	15	15	70
France**	3	15	82
Great Britain	7	27	66
Germany (West)	10	20	70
Italy	3	20	80
Belgium	2	20	78
Netherlands	4	19	77
USA***	23	66	11

Kilde: Byrkjeflot, 2001, s 41.

\* Scandinavian data from 1970; \*\* Other European data from 1968; \*\*\* from 1964

As we would expect the typical pattern in most countries is that CEOs come from wealthy families and have academic educations. The US and Denmark differs most concerning class origin, but only Denmark differs with respect to the role of academic education (Ibid: 45) combining a higher proportion from lower and middle-classes and with non-academic educations. From our field studies we know that many a manager started with an apprenticeship, worked for a number of years as a journeyman, then engaged in e.g. a technicum-engineering education and finalized with a diplom-education in Management (Kristensen, 1986). Having during this career been involved in jobs at nearly all possible levels and within different firms creates people with a larger role-set and ability to understand others in different stations, than it does for managers that have been recruited to a high level of bureaucracy after an academic education. Beyond doubt, such managers will have a much better feel for how responsibilities can be distributed, they may be better at “taking on the role of others” (Mead, 1967) and they will be better at exercising authority in a non-conflictual way (Barnard, 1938). In workers they may even see future managerial colleagues and thus give them as worker a leeway for pursuing such aspirations.

A significant difference between the US and Denmark, despite their similarity in opening up for persons from humble positions to become top-managers, is the mobility across firms. In the US employees primarily pursue an internal bureaucratic career, whereas in Denmark the route goes through a number of firms. 42% of Danish managers had worked in three or more companies before achieving their current position against only 19% in the US (Byrkjeflot, 2001: 66). Barley and Kunda (2004) in their study of itinerant experts show how normal employees develop a narrow network of relations within bureaucracies, while short-term contract workers operate in such a way that they achieve a large “network of practice”. We think it is quite obvious that the itinerant practices of Danish employees create a dense network among persons, but as this network is simultaneously combined with “permanent employment” in firms it leads to a dense and multileveled, though very volatile, network among firms. In this network it is easy to exchange goods and services, but it also plays an extraordinary strong governance role, as reputation can be quickly improved and destroyed – both at the level of employees, teams and entire firms – as somebody always knows someone in a distinct firm. Informal “Rules of conduct” plays a major role for making business (Kristensen 1996; Nygaard, 1999)

and this may be why Denmark scores high on internal indexes on trust<sup>5</sup>? The costs associated to spoiling ones reputation can be immense and long term.

The picture that emerges of Denmark around the first oil crisis and before cumulative forces of change and globalization set in was a society where equality was not only related to normal Welfare State institutions. Equality was also related to education and vocational training, class-transcending careers at work and dense networks between firms and employees. Many of the behavioral codexes on this “system” owed their origin to small railroad towns of the countryside in which employees shifted jobs and employers, from agriculture to craft to industry throughout the year and where life-courses moved persons from an apprentice and a farmhand to mastercraftsman, farmer or entrepreneur (Kristensen, 1992). In these rail-road-towns flexicurity meant that a small number of people could construct a modern, very far-reaching and heterogeneous society, which would have been impossible if they had modernized by establishing large scale bureaucratic organizations. In this respect Danish industrial localities were in general very different from the corporate-towns (Brüksamhälle) that were so typical for the other Nordic countries.

### 1.3. The Danish Route to the New Economy

In many ways, the Danish business system was ideally constructed for meeting the challenges that was posed globally by the first oil-crisis and onwards. With increasingly volatile markets and fast shifts in customer demands, Denmark possessed the capability to recombine firms and workplaces in new ways and create changing products (Piore and Sabel, 1982). This happened through an overall rapid increase in number and employment in SMEs in Jutland and a decline in East-Danish large industrial cities (Kristensen, 1992:129-130). In agricultural areas the population transformed from farmers to craft-workers and entrepreneurs by making use of vocational training institutions, while in cities the population aspired for employment in services, education, professional occupations and R&D. From the mid-1980s this process is intensified as employees and unemployed flocked to courses in further training to achieve IT-literacy among all professional groups, including the formally unskilled (Andersen, 2003: 108 ff).

Yet, transformation did not come easy. At firm level, managers had to shift from Taylorist managerial templates to new and much less obvious ways of organizing. Simultaneously new and large cohorts of workers and women in increasing proportions flocked to a labour market that was already depressed internationally. Unemployment increased dramatically, partly because the governments of the 1980s believed that you would have to observe a certain level of structural employment to keep wages and inflation from coming out of hand. From a macro-level perspective things looked very sad in Denmark, whereas at the micro-level, firms and employees were making radical experiments in the organization of work and in skills among employees (Kristensen, 1986). When a Social-democratically led coalition

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<sup>5</sup> ”86 lande over hele verden har i flere omgange deltaget i den såkaldte World Values Survey-undersøgelse, og i ingen andre lande svarer så mange ja til, at de mener, at man kan stole på de fleste andre mennesker som i Danmark. Ved den seneste WVS-undersøgelse i 2000 sagde 64,5 procent af danskerne ja til spørgsmålet, om man kan stole på de fleste andre mennesker. Men blandt franskmændene var det kun 22,2 procent, i øvrigt markant under Spanien med 36,2 og Italien med 30,7 procent og mindre end det samlede gennemsnit for de 86 lande på 28 procent.” (Frede Vestergaard: Tillidssamfundet Danmark, Weekendavisen, 5. januar 2007)

government came into power in the beginning of the 1990s, the ambition to gradually reduce the level of structural employment became a focal bench-mark. And this created the active labour market policy that gave an entirely new twist to Danish flexicurity and its “Golden triangle” (Madsen, 2006).

With the active labour market policy, Denmark became the most continuous training intensive of all EU and OECD-countries. In 2003 it used 0.85% of GNP on further training, most of which serves unemployed (0.67%), but also for employed Denmark is number one (Økonomi- og Erhvervsministeriet, 2006: 170). On a yearly basis, typically 60% of highly educated, 40% of the craft-workers and 30% of the formally unskilled participate in further training. In the US the level is the same for the two first mentioned groups, while the level is only 13% for the unskilled (Ibid: 169). OECD has calculated how many hours of non-formal further training an average employee can expect from working life in different countries (OECD, 2006: 334). Of all the countries Denmark comes in number one with about 930 hours, then follows Switzerland and France with approx 720 hours, Finland and Sweden with 675 and 625 hours respectively. The US comes number 7 with 475 hours; while Germany surprisingly is number 10 with 400 hours and the Netherlands number 13 with approx 280 hours. Interestingly, continuous training seems not to be an important mechanism for the Irish miracle as the number of hours here is only 200.

There is very few penetrating studies of what happened in work-organization during the 1990s. Kristensen and Petersen (1994) however have shown that the tendency to integrate planning and execution was widespread in both industry and financial services. Jørgen Goul Andersen (2003: 105) has in two surveys – 1985 and 2000 – asked Danish employees whether they “use their own ideas in their jobs”? The answers are shown in the Table below:

**Table 1.2 : The Autonomy of employees. 1985 and 2000 in Pct.**

Question: Is it “often” or “now and then” demanded that you use your own ideas and plan important work-tasks?

	1985	2000
Often	34	69
Now and then	21	20
Not demanded	40	11
Don't know/No answer	5	-
N(=100 pct)	978	894

Source: Andersen, 2003: 106

Though Denmark by the beginning of the 1980s was the most high-discretion country, since then a minor revolution has taken place as the proportion of those that often use their own ideas on the job has doubled and nearly 90% has become engaged in a much more active way in their jobs. 76% also say that they have very good or good possibilities for exercising influence on their workplace (Ibid, p 107), which indicate that they pursue these jobs by also being engaged in transforming the larger organization, and this indicate a whole new way of “organizing”, which our case-studies will explore more in dept in Chapter 2. Among male workers, 71% often introduce own ideas at work, while 77% have good or very good possibilities to influence the larger workplace. For women the percentages are 66 and 75% respectively. Though it is slightly lower for women, it is our guess that it is primarily among women that the increase in job-autonomy and participation have increased most dramatically.

Thus one is inclined to expect that Danish firms has mass-mobilized the workforce to be engaged in continuous change.

In a survey on the flexibility of Danish firms from the mid-1990s, it was found (Gjerding, 1999) that 25% was both internal and externally flexible (dynamic), 26% was internal flexible and 8% external flexible. The remaining was characterized as static (Ibid: 7). Interestingly it was in industry that flexibility predominated:

Although all firm sizes and sectors were represented in each group, some general patterns appeared, apart from the group of mainly internal flexible firms that was quite evenly scattered across sectors and firm sizes. The group of static firms was dominated by small firms in the trade, construction and transportation sectors, while the small group of mainly externally flexible firms was dominated by small- and medium-sized firms and biased towards the manufacturing industry. Finally, the group of dynamic firms was dominated by the manufacturing and business service sector, biased towards firms with at least 100 employees. (Ibid: 6).

Gjerding emphasizes that where other Nordic countries make use of a number of modern managerial techniques to achieve similar outcomes in terms of functional flexibility, this is primarily achieved in Denmark by an extensive delegation of autonomy to employees (Ibid: 10). This means that it is primarily through the skills, role-sets and interaction among employees that firms have gained flexibility,

A similar picture is drawn in a study by Lorenz og Valeyre (2003) based on the third "European Survey of Working Conditions" made in EU-15 in 2000. Here only 6.8% of the Danish employees say that they are working under Taylorist forms of work organization, 11% in traditional (e.g building and construction) and 21.9% under "Lean" forms of organization. The great majority of Danes, or 60% say that they are working in "learning organizations", characterized by high autonomy, absence of highly formalized forms of control, etc. (Ibid: 13).

When 60% says they work in Learning Organizations it has dramatic effects on how we interpret a number of phenomena, because they alter their scope compared to work arrangements of a more Taylorist kind. For instance, formal further training under Taylorism was often to transfer a worker from one rather simple to a new simple job. But in a learning organization, training courses plays a different role – but which? And if work also means a constant processes of role-redefinition, what does this mean for the traditional divisions among workers, supervisors, managers and white collar staff? What is the difference between normal work, being continuously improved, and development and R&D? Etc; etc?

On the whole, the dynamic of Danish innovation and its innovation system is somewhat of an enigma. Neither Denmark's state nor its enterprises invest large sums in R&D, especially when compared with the US, Finland and Sweden. While these countries lies at the top in GERD as percentage of GNP, Denmark lies in a crowded middle field, spending around 2% of GNP. However, it is primarily the state that lacks behind. Private investments shows impressive growth from 0.5% of GNP in 1981, over 1 % in the mid-1990s to about 1.5% in the beginning of the new millennium (Økonomi- og Erhvervsstyrelsen, 2006: 109). Denmark in particular shows high-expenditures among SMEs in comparative perspective, and this is probably one of several reasons why the output of new products

for the market is relative high compared to the overall spending level (Mariussen, 2006). However, as the turnover of new products is around 10% of total turnover, Denmark seems only to renew its product at half the rate as Finland (with 20%). However, Åge Mariussen (Ibid: 227-231) has shown that Denmark is the most efficient producer of innovations. In 2000 the value of the turnover of new products was twenty times higher than incurred costs the three previous years. In Finland the comparable figure was 10 and for most countries it was 5 or less.

Denmark thus is number 5 in the aggregated comparison of EU 25 (+ Japan and the US) of the *European Innovation Scoreboard* (2006: 8), which makes use of a complex set of factors to measure in- and output of the innovative activities. At the same time Danish innovative performance is assessed to be progressing compared to the countries lying ahead of Denmark (Sweden, Finland, Switzerland and Japan) (Ibid: 4). Denmark owes its high position in particular to the proportion of the population with a higher education, diffusion of IT-networks, life-long-learning, collaboration among innovative SME, risk-capital for business start-ups, use of organizational innovations in SMEs, employment in high-tech-services and to sale of new products (new to the firm but not to the market) (Ibid: 13). When Denmark in this study only measure mediocre in terms of performance compared to inputs of (Ibid: Figure 6, s 15), the reason is that Denmark seems to be bad at accumulating intellectual capital, in particular through patenting. In contrast it is very keen to claim "community design" rights concerning the design of a product and to "trademarks".

Denmark's unique position thus seems to be dependent on a strong and ongoing development in both design and the production of a product, where employees simultaneously search for improvements in collaboration with customers, while searching for improved ways to produce the product. LO has financed a study of the extent to which different employee groups are involved in this development process (Rambøll Management, 2006 A og B). In a study of a number of case-firms (Ibid: B) within both the private and public sector, this involvement seems to be very far-reaching. For that reason, the survey data below was considered rather disappointing to the investigators, especially concerning the formally unskilled (Ibid, A: 22ff):

**Table 1.3: The participation of different groups of employees in development work (Share of firms in percentage, according to managers (2005)).**

<b>-Development of products, solutions and services</b>			
	Medium and long Higher education	Craft- or short Higher Education	Unskilled
Industry	90	75	29
Private services	86	74	41
Public Sector	95	90	51
Totalt	90	78	44
<b>-Development of processes and practises</b>			
	Medium and Long Higher Education	Craft- or short Higher Education	Unskilled
Industry	93	81	36
Private Services	85	81	54
Public Sector	98	91	61
Total	91	84	54

Kilde: Rambøll Management 2006: 22-29

In a crosscutting analysis the study found that in 51% of the firms, both unskilled and skilled workers are involved in R&D in some or to a high degree (Ibid, A: 30), while simultaneously in 31% of the firms, unskilled are not involved at all, while skilled workers are. Interesting enough it is those firms that seems to involve employee the most that create the most satisfactory results of innovation-processes (Ibid, A: 48-50). Involvement of users and customers generally is at a high level, but is highest in firms with employee involvement (Ibid, A: 52).

On the whole we get a picture of Danish firms in which most employees are involved not only in daily production, continuous improvements, etc but also in innovative activities. This seems to happen in strong interaction with persons, external to the firm. Thus a study found that 57% of respondent employees worked together with external partners on a daily basis, 20% on a weekly and 6% on a monthly basis, while 80% had been involved in improving external relations (Undervisningsministeriet, 2005: 79). This gives an indication of intense interactions internally and externally where frequent role-definitions may take place very quickly.

Whereas Denmark seem to have been able to enable employees to take part in these processes through public institutions in further training, the public sector has done less and less to underpin innovative investments by a larger, partly public financed innovation-system. In a comparative analysis of the Innovation Systems in the Nordic countries Håkan Gergils (2006) characterize the Danish government since 2001 by a lot of promises on increases in resources and a de facto decrease. He describes a number of new “institutions” that has been launched, but which has rather been words than mechanisms that could assist Danish enterprises in their drive towards innovativeness. However, growth in private R&D has been steady and not very far from the level of investments in R&D in Finland and Sweden. However, it is obvious that Denmark has not established nor thrived on the sort of “innovation pump” that have played such an impressive role in the US (Silicon Valley, Route 84) and in Finland (around Nokia) both in terms of innovating new products, but also in creating the networks globally that make it possible to take advantage of different regional clusters, specializing in some sort of useful skills and knowledge (Saxean, 2006). The Danish innovation pattern is much more diffuse, takes place in firms from many different branches and is not focused towards a specialized market segment. Beautiful furniture, advanced films, highly reliable pumps, tricky equipment for developing countries, pharmaceuticals, well-designed hi-fi, economically efficient windmills, sophisticated enzymes, smart hearing aids and high-quality food comes out of firms in a very heterogeneous business structure in a fairly steady stream, always making use of the great world streams of innovation such as IT, bio- and nano-technology.

In the 1980s it was clear that the Danish business structure was great in organizing exports, whereas it had troubles in organizing and expanding through outbound Foreign Direct Investments (FDI). It is fairly obvious that SMEs with either skill-container or project-coordinator attributes had neither the size (as had Swedish firms) nor the type of focus (as had the Finish forestry industry) that made international expansion possible. By also earning some of its competitiveness to the fact that it could reduce overheads for managerial tasks to a minimum by delegating responsibilities to normal, “operative” employees, Denmark seemed to lack also the type of personnel that engage more active in globalization. As shown in Table 1.4 below, by 1990 Denmark was at a very low level concerning outbound FDI whereas there seemed a higher temptation to invest in Denmark from foreign firms – as

inbound FDI to Denmark was remarkably higher than for both Sweden and Finland<sup>6</sup>. However, Table 1.4. also shows that a radically change in globalization took place from 1990 to 2002 – in the period where the radical transformations of work organization also took place. As can be seen, the level or importance of inbound FDI six-doubled, whereas the level of outbound FD eight-doubled:

**Table 1.4 : Foreign Direct Investments (stock) in percentage of GNP 1990 og 2002**

Country	To/from	1990	2002
Denmark	To	6.9	41.7
	From	5.5	43.4
Sweden	To	5.3	46.0
	From	21.3	60.5
Finland	To	3.8	27.0
	From	8.2	52.8
USA	To	6.9	12.9
	From	7.5	14.4
England	To	20.6	40.8
	From	23.2	66.1
Germany	To	7.1	22.7
	From	8.8	29.0
France	To	7.1	28.2
	From	9.1	45.8
Ireland	To	72.3	129.1
	From	24.5	29.9
China	To	7.0	36.2
	From	0.7	2.9

Kilde: Eriksson et al 2006: 9.

Measured in FDI Denmark has simply undergone a globalization-revolution within a decade – just as Sweden and Finland and probably Norway. Denmark and the Nordic countries have surpassed the continental European countries, which used to be markedly more globalized than the Nordic. And they have moved close to England, which has benefited immensely from a stronghold in financial services, which the Nordic and in particular Denmark, not have been able to use as a mechanism of globalization. In this light it becomes somewhat of enigma how Danish globalization has happened.

It would be naturally to expect that a few large firms had been especially active in doing the globalization as with Nokia in Finland, but Eriksson et al (2006:62) note that it in Denmark also involves SMEs<sup>7</sup>:

<sup>6</sup> One of the foundationable hypotheses behind the DanReglo project and Translearn was that Denmark globalized by accepting to be taken over by foreign MNCs and using this way to create novel international ties.

<sup>7</sup> Eriksson et al anfører at de følgende tal er en del af de 5603 virksomheder med mere end 20 ansatte i Danmark i 2002. Tilsyneladende stiger antallet dramatisk hvis de helt små virksomheder medtages. I en FN rapport fra 2005 oplyses det således, at Danmark havde 9.356 virksomheder, der var hovedkvarterer for udenlandske datterselskaber, mens der var 2.305 filialer af udenlandsk ejede virksomheder i Danmark. Til sammenligning var 4.260 Svenske og kun 900 Finske selskaber hovedkvarterer for multinationale selskaber (United Nations, 2005: 264)

In 2002 775 Danish business firms had at least one subsidiary in a foreign country, compared with 682 in 1997. 90% of the MNCs were SMEs with less than 650 employees. 34% of employees had jobs in SME multinationals, while 21% were employed by 78 MNCs with more than 650 employees.

This pattern could indicate that a limited number of fairly large Danish firms have been active and have drawn a larger swarm of smaller enterprises with them, so that at this point 51% of Danish employees are employed in firms that have made outbound FDIs, but Eriksson et al (Ibid: 63 ff) also notes that the trade in intermediary products indicates that Danish firms has moved closer to their customers.

In any case it seems as if the primary reason has not been to organize an international value chain, where the Danish firms could harvest the benefits of cheap labor in other countries. Also the Danish branches of Danish multinationals show characteristics that prove their legacy of skill-containers. On average, in Danish facilities 59% of their employees were craft-workers, 25% were formally unskilled and 15 had higher education. But this pattern is repeated in foreign affiliates. It is indeed thought-provoking that the figures in foreign subsidiaries are very similar: 58% of craft-workers, 27% of unskilled and 15% with higher education (Ibid:66). While the proportion of foreign employees in these companies have expanded rapidly, the absolute number of Danish employees has not decreased. And yet, very odd and paradoxical changes in proportions of the employees seem to be going on. In 1997 8% of the employees in Danish affiliates of these companies were engaged in research and development, while the figure was only 4% in foreign affiliates. In 2002 the picture had turned around. Now 4% of the employees in Danish affiliates did R&D, while the proportion in foreign subsidiaries had doubled to 8%. So also in this respect the Danish pattern of globalization is a break with the long established traditional pattern.

## **2.0. Case-studies: Introducing many small worlds.**

In what follows we will simultaneously explore the experiments with novel ways of organizing work, redefinitions of jobs and roles, changing relations to other firms/customers and the way Danish firms globalize. Initially we were searching for Danish firms that had become involved in globalization by being taken over by foreign MNCs as we expected inward FDI to be the major source of Danish globalization and therefore we would investigate whether and how they within such a frame could participate actively in changing their mandate and position. However, as our investigation proceeded it became difficult to make a distinction between internal and external FDI. As will be clear, especially from the Radimeter-case in the following casestudies, a Danish firm may be included in a global MNC exactly because it has in a previous phase pursued an endogenous form of globalization. Thus FDI is just one of many different mechanisms by which firms on a global scale are mutually engaged in role-redefinitions, but as we shall see ownership does make a difference, especially concerning the governance of firms.

Thus in what follows we try capture the logic of experimental development in four firms focusing on the dimensions just mentioned in order to catch a glimpse of the path each of these firms follow. The first firm, Unimerco is a Danish SME, which has developed a very distinct way of organizing an expanding relationship to customers, and who is using this to explore the world outside Denmark. Then follows two subsidiaries of foreign firms, the Spirit Factory and Sauer-Danfoss, and finally Radiometer

is used to explore a Danish MNC that is turned into a subsidiary. These firms have been selected for more careful field studies out of a larger sample, which we visited in a former phase of our studies. The data-collection in the four cases took place by first a full day visit by the three authors and then one of us came back and studied the firm four weeks through participant observation, interviews and by collecting written material. For the purpose of this chapter we have tried to condense the description as far as possible with the risk of losing the unique development dynamic of each, which is exactly our aspiration.

The cases will bear witness to see firms as a “Collaborative Community” (Heckscher and Adler, 2006). Globalization and innovative change is a great challenge to this community as it threatens established rules of the games and governance principles. In particular we shall demonstrate how far Danish firms have come in organizing collaboration and preserving trust by self-governance and has coped with the risk of losing reputation at local labour markets. When their usual pattern of behavior is confronted by American Lean-managerial practices and governance forms, work-life becomes indeed complicated. And yet as we shall see in some of the studied cases such challenges are used to deepen the art and mechanisms by which the collaborative community develops.

Speaking for themselves, the cases give a clue to the transformations that have been going on in Danish firms over the last decade, how they have been able to integrate themselves into the larger global world and how active all levels of the firms are in searching for novel ways to survive and grow. We will present each and every as their logic became visible to us, without really making clear how they inform us about larger issues.

## **2.1. Unimerco: A small Danish Multinational from a small village.**

Unimerco is an extraordinary company in many ways. It produces cutting tools, nails and nail-guns, but sees its main business as offering customers production optimizing consultancy services, tool management and -maintenance as well as education and training. It is a Danish multinational with headquarters located in the village of Sunds north of Herning, Jutland. It is fully owned by management and employees, and ownership comprises 85% of the employees. The employees are team working in very unconventional physical facilities. As “roofed villages” all Unimerco companies are designed along ideals of a village community, with production and sales/administration situated in the same location with no walls separating departments. The headquarters is one big 20,000 m<sup>2</sup> building in which production, stores and administration literally are placed on the same floor in one open room. On top of the building are seminar rooms, a huge auditorium, visitor rooms, etc., offering facilities for organizing courses for both customers and employees.

Unimerco was founded in 1964 and activities have developed considerably since. It has moved from standard to very specialized tools and service solutions, and has built up its international capacity since 1995 to become a small multinational – with subsidiaries in Denmark, Sweden, Norway, Germany, the UK, the USA, China and the Czech Republic. Today it employs 560 people of which approx. 500 are working in Sunds.

The company is a genuine success story, which is reflected in both financial results and in an excellent work environment. It has never operated at a loss in its 42 years of existence. In the financial year 2005/2006, Group equity amounted to 73 million Euro and revenue equaled 86 million Euro. Year after

year it figures among the ten best workplaces in Denmark. It improves constantly on the work environment from the benchmarks of short-term sickness absence, which it has managed to bring down to 0.9%; by lowering the level of staff turnover, etc. Close to 10,000 visitors a year demonstrate that Unimerco is a very successful and different company (Information sources: Unimerco's website (20-02-07) and written company materials, brochures, etc).

### **Historical evolution of ties to customers and suppliers**

From its beginning in 1964 the product program consisted of Tjep nailers and ancillary brads. Later an exclusive distribution agreement for Paslode (now ITW) founded a long business relationship, and IWT is still Unimerco's key supplier of fastening products. Then Unimerco started to distribute cutting tools for the woodworking industry in collaboration with Leuco, a Dutch supplier. To do so, Unimerco needed to regrind cutting tools. It purchased a multi-purpose grinding machine, and began more generally to regrind tools for the region. Gradually Unimerco invested in more machinery and expanded the product program to service not only the woodworking industry, but also metalworking, food and graphic industries in a region that was expanding rapidly. By the late 1970s Unimerco expanded further by establishing business relations with numerous suppliers of tools for woodworking and furniture industries. From the beginning of the 1990s measurement and calibration equipment were added, and calibration services and measuring tools were offered to customers. In 1999 a tribology department, working with surface treatment (e.g. PVD coating and ion-implantation) and a training center were set up. Thus sale of safety courses and other forms of education and training became a new field of activity. Recently Unimerco has used its knowledge to become certified as a quality toolmaker for suppliers to the automotive and aerospace industries. Technologically it has just moved into making use of nano-technologies to create new surfaces of its speciality tools. In short, by continuously expanding its activities Unimerco has transformed itself from a small local supplier of Tjep nails to a service-oriented total supplier, operating on the global scene in a tight interplay with customers in need of high quality tools. The tight interaction is illustrated by the fact that approx. 7,000 tools pass through the regrinding department every day.

Being not just a tool supplier, Unimerco position itself as a problem solver and supplier of total solutions, including customized tools and very know-how intensive services. It supplies "traditional" products such as cutting tools, lamina inserts, tool-fixtures, fastening systems, and measuring equipment, but always in combination with for example services such as tool maintenance, calibration and production optimization and to many industries (aerospace, automotive, building and construction, food, general machining, Oil and gas, tele-communication, wind turbines, woodworking and furniture).

Through its close interaction with customers, the company has developed a wide range of competencies, and what it learn from one customer, can be used to service others. These competencies are collected under the "UM concept(tm)". The total concept comprises competencies in production optimization, standard tools (complete tooling programs), customized/specialized tools, tool maintenance, tool management systems, and training and education. With the customer Unimerco works on continuous cost reduction and production optimization, by analyzing and optimizing key processes, gives advice and guidance on machine and tool investments and offers guidance when customers introduce new products, according to specific needs and variety of contexts. Production optimization, according to Unimerco's working methods, is thus a continuous joint process, built on collaborative partnership.

As Unimerco climbed towards technological excellence, it also became a highly interesting customer for its own suppliers of machines for tool-making, measurement instruments, etc.. They are eager to work with Unimerco on test-versions of their equipment and engage it in collaborative co-design of future generations of technologies, well before they become marketed for ordinary customers. We accidentally observed an Unimerco employee busy co-authoring the official manual for a supplier's product.

Cooperation across boundaries (professional, geographical, cultural etc.) through close co-designing partnerships with customers and suppliers has been one of Unimerco's central trademarks since the company was founded. This also explains why it became a multinational. As many of Unimerco's local/national partners have moved units or whole production plants to foreign countries, it has been Unimerco's strategy to follow in their partners' "global steps" by proactively becoming a global actor itself. Since 1995 it has invested DKK 645 million in foreign facilities (Unimerco's website 02-01-07, written company materials, brochures, interview KI 1&2 etc.). However, it seems as if globalization has led to the discovery that its growth potential is almost limitless. The new strategy aims through organic growth to increase revenues to DKK 1150 millions by 2009/10 compared to the current DKK 643,5 millions, double earnings and to expand from 565 to 820 employees. In addition it has financial capacity to expand by mergers and acquisitions and intends to do so (<http://www.unimerco.com/index.php?mid=34&pid=451>).

### **A collaborative community**

Unimerco attributes its success to some interesting core ingredients:

*"One of the most important ingredients is a community feeling in which we are all team players and in which management and employees share a common interest in the growth and earnings of the company. Structure, management and organization are based on cooperation, confidence in each other and common interests. UNIMERCO's interior arrangement, organization, ownership structure, pay system, etc., are based on this view as we are all responsible for our work, colleagues, quality, customer service, etc."* ([www.unimerco.com/index.php?mid=31&pid=233](http://www.unimerco.com/index.php?mid=31&pid=233))

In field interviews we have spent hours questioning this rosy picture or alternatively finding explanations for its construction. As far as we can assess it is not easy to see how it is constructed, but it is evident that Unimerco has removed all the organizational devices that make opportunistic, self-seeking strategies by departments, managers, work-groups, employees an obvious route to take. First, all employees are paid fixed salaries (within three salary-levels: blue and white-color and managers) and these salary-levels are surprisingly low. Second, all employees and managers are subject to identical "profit-sharing", that is a similar nominal bonus based on past months surplus compared to budgets. The extended "we" of the entire firm, not the individual unit, rank and/or department, is in focus. No discrimination between owners and non-owners, only absence due to sickness implies a reduction in bonus share. Third, approximately 475 employees are co-owners and own a significant amount of stocks (worth approximately Euro 100.000 each). The price of stocks, dividends, etc. is dependent on Unimerco's revenue, earnings, and equity, and the argument for becoming a co-owner is that by contributing to the overall performance of the firm, the individual works for his/her own benefit. The firm has made arrangements with a number of banks concerning terms of loans, interest

rates, etc., and therefore it is easy to see what level of results will create a break-even, when comparing incomes from stocks against expenses on loans. Ancient models for co-owning a fish-boat and dividing earnings have inspired the whole scheme. Fourth, the “roofed village” makes it easy to contact people across organizational divides, and to see, who is available. No doubt, there are also good opportunities for people to mutually exert pressure so that everybody wants to look busy. Fifth, a direct consequence of the ownership model is a very horizontal and participative form of authority and a high degree or level of transparency. For example, employees are daily informed about turnover, and each month they receive a detailed report of accounts, strategies, assessment of outcomes, etc. All relevant information is communicated on a daily basis through notice boards located near the canteen and by intranet. Every second month all employees participate in so-called café-meetings, where the CEO informs about results, strategy, future challenges, etc.

Management describes the company’s information and communication philosophy in the following way:

*“Good communication is a basic element in our culture ... ..The perfect manager really wants to inform, so all gets involved and committed. We recognize that question and constructive criticism is foundational for development and better decisions. We shall dare make information, decisions and acts visible”* (Brochure: Information og kommunikation UM)

According to Weick (1993) these are very important steps to engage a group in virtuous circles of mutual commitment, from which procedural justice and learning by monitoring (Kristensen and Zeitlin, 2005: ch 10) may emerge and constitute an effective governance system. Unimerco is very explicit that this is also the purpose of their owner culture:

*“The reason for offering employees shares in UNIMERCO is a wish to make competent and loyal employees in all Group companies joint owners of the company and in this way motivate to commitment ... ..Trough the employee share scheme UNIMERCO is... ensuring that we make the most of all the employees’ resources”* [www.unimerco.com/index.php?mid=31&pid=234](http://www.unimerco.com/index.php?mid=31&pid=234)

Thus, the on one hand the co-ownership model enables increased democracy, delegation of responsibility, transparency, motivation, care and empowerment, but on the other it is also clearly being used as a management tool to make the most of human resources. That the model both seems to work as a very effective incentives-system and as an empowering organizing practice is a paradox that Unimerco does not neglect. Quiet the contrary they are very explicit about it and discuss the two effects of the co-ownership model in a direct and open way.

The “roofed village” was introduced in 1990 because a traditional hierarchical organization impeded collaboration across units. Physical boundaries were demolished to create visibility, greater presence, and shorter communication channels among units. The ideals of a typical village, where everybody knows each other and the roles of each is now the organizing template. As in the village community, physical surroundings allow for and support unlimited communication, swift decisions, facilitate the experience of proximity and connectivity among colleagues and knowledge sharing across functions and occupations. The physical surroundings and corresponding work organization still seems years ahead – compared both to existing literature on post-industrial work organization and to the current scope of comparative forms of innovative work arrangements based on employee participation. In Denmark, experimentation with new collaborative work practices transcending traditional bureaucratic

or rigid team-based settings can be detected within most organizations, but very few have transformed its physical layout and structure as radically as here<sup>8</sup>.

The physical design creates a significant work space that underpins the company's collaborative work style. Any form of space affects social processes and enables distinct social practices by governing what are possible and not-so-possible actions and interactions. Thus Unimerco's physical design embodies an organizing technique or management tool that regulates rules of conduct. The interior promotes very clearly relations of transparency, open communication, and cooperation across traditional bureaucratic boundaries, and thus frames the employees' interaction patterns in a very distinct way. In particular, the physical layout makes the ease of collaboration and possibilities for continuous co-creation very visible<sup>9</sup>.

Within this frame, people work in teams. The current team organization was introduced together with the roofed village. However Unimerco emphasizes that teams are not a new phenomenon. The work has always been collaborative creating a pattern of employee and customer driven innovations. In principle all areas of the company may become involved in shifting combinations, dependent on particular customer needs. The entire formation of teams operates in very informal ways and e.g. lean systems of governance have not been adopted. As one of the team leaders puts it:

*"we don't call it lean – but we have always been practicing lean...it's just about using ones common sense...more than 15 years ago we started to work systematically with how we could become at learning from our errors and continuously reduce production costs.....slim production, kaizen events, elimination of waste are just fancy words for something we have always done....."*

(Interview Team leader OM/ + production manager).

Noticeably, the result is a dynamic team based work practice creating strong internal and external collaborative relations – where reflexivity and a continuous strive for co-improvements seems to be the most distinctive features. In terms of the ability to create collaboration across boundaries and building situational co-designing and reflexive teams - internally among employees or externally with partners or new subsidiaries - Unimerco seems close to utopia.

We (Lotz and Kristensen, 2005) have observed that the more team members are engaged in inter team activities and collaborative practices across formal (team) structures or professional boundaries, the more they reflect upon how to improve existing routines, share responsibility and work towards common goals, and the more they are ready to take part in co-design, continuous improvements and innovative change. Thus the vaster the team community's external interactions and its relations towards other teams are, the wider the community of teams, and the better is it able to overcome many a challenge that would often lead teams into routinism and self-satisfied behavior. Unimerco seems to

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<sup>8</sup> Oticon is another Danish firm, which is much more often cited in the literature because of its "Spaghetti-organization", which tries to increase communication by having people move around physically to connect in new collaborative teams more frequently ( ).

<sup>9</sup> On the other hand Unimerco's unique design of space also is restrictive. For instance, it prohibits privacy, individualistic (egocentric) behavior, obvious laziness (e.g. arriving late, having too long coffee breaks, using ones private cell phone during working hours etc.), and unwillingness to follow the tact and tone of the group collective. Everybody (is able to) watch everybody. The panoptic tones are very precisely reflected in the following quote. *"Due to our physical surroundings we don't need a system to official register the hours worked – because by looking around we can easily see who is here and for how long..... It's a very sufficient indicator"* (Interview MM/+ KH).

have created such a collaborative work environment - where cross-fertilization flourishes and gives rise to reflexive co-designing dynamics, but also surround teams with strong ideological convictions:

*“At UNIMERCO it is considered to be a team sport to run a business and that is why we place the team above the individual. Star players are always welcome, if they fit into the team and are willing to follow the group tactics – it is of no use being the best tennis player in the world if the rest of the team plays soccer. In practice this means that we have the courage NOT to offer a job to a really excellent individualist, if the person is unable to use his/her skills in cooperation with others. We have no need for egoists but we welcome team orientated individualists at UNIMERCO”* ([www.unimerco.com](http://www.unimerco.com) 02.01.07).

At Unimerco each unit (e. g. regrinding of metal tools, the calibration center, the sales or construction department etc.) represents a form of **basic team** divided into smaller sub teams dependent on the units' actual work functions, operations and work tasks. Strong professional bonds and feelings of pride towards the units' specific work activities, competencies and performance results characterize life within different basic teams. Collaboration, a high degree of mutual interdependence, dialogue and ongoing professional exchange of know how, ideas and jokes are how employee describes their work practice inside basic teams. Many depict the basic team as a home or a nuclear family.

However, simultaneously more provisional, **ad hoc teams** are continuously constructed across functions and operating units dependent on required competencies and resources related to a given task or project. Hence collaborative team communities of employees from different units and with different skills and competencies are assembled on an ongoing basis. This way of forming crisscrossing collaborative temporary teams not only unfolds locally (for example in Sunds), but is today connecting all the sites of Unimerco on a global scale and at numerous levels. In this way the organizing practice of the roofed village circumscribes the global organization (*cf. interview med Peter Kristoffersen and Carsten Risum*).

These more temporary and fluctuant collective practices that criss-cross the organization's basic team settings involve significant collaborative dynamics, whereby individual employees learn to take on new roles, enlarge competencies and may create novel life courses and working careers. According to the employees it is especially this “clash” of different competencies and interplay between divergent roles within the ad hoc teams that enables a common focus and ensures a joint commitment towards the wider organization beyond ones basic unit. By participating in different collaborative combinations across units/departments employees interact and exchange knowledge and information that enable the gain of greater knowledge about colleagues' work functions, competencies, challenges, dreams, etc. It creates a system of mutual recognition (Honneth, 2003). This again makes it possible to create ad hoc teams that none would have imagined, so that many of the employees articulate how the integration of divergent competencies and roles enable continuous learning triggered by both collaboration and rivalry. It is their experience that such co-creating processes result in better innovative solutions and performance results – and therefore they have a common interest to engage in, develop with, and learn from these forms of collective interdisciplinary activities. According to the employees, working together with other professions (production workers, engineers, technicians, sales representative, etc.), strengthen the ability to learn, re-learn and take on new roles<sup>10</sup>.

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<sup>10</sup> This way of working also itself creates a commitment towards the larger we:

*“CTU and production are collaborating closely... it clearly pays. We do it quite deliberately (that is, involve production already in the idea and development process), as the flow becomes much better when we involve production people from the*

Often it is the R&D or the construction department that initiate moves to form new ad hoc teams. The R&D basic-team normally consists of only six-eight members, but temporary ad hoc teams of fifteen-thirty employees of diverse professional skills are typically formed to work on the same development project. The organizing form is very loose and organic in its structure. It relies to a high extent on self-management and decentralized coordination among the basic units. Thus the basic team units decide for themselves who to “lend” and for how long (most often managers and employees make such decisions jointly). Either employees volunteer to join an ad hoc team or they are picked due to special skills or competencies.

This practice with hardly any centralized hierarchical coordination seems to be monitored by collective processes of involvement and co-creation. Asking the employees how this formation of teams were monitored made them look bewildered, replying *“that’s just something we do...we seldom think about it”* (Interview Tony + Steen). Clearly they take their fluctuant organizing form for granted. Without really noticing, they seem to monitor these crisscrossing collaborative team practices in a highly flexible way on the basis of mutual involvement and reciprocal adjustments. We think that the wider “we” of Unimerco provides a monitoring function, where ad hoc teams is also governed by a strong work culture among the employees that enthrones mutual support, knowledge sharing, and a work practice characterized by an outstanding willingness to join hands.

According to the employees, you cannot be a part of the team community if you are not willing to continuously learn and teach others. One of them puts it in the following way: *“Here we are all equal, whether you are a newcomer or one of the old ones we get the same salary – you can’t gain anything by keeping knowledge to yourself.... Success is all about knowledge sharing and collaboration”* (Group interview). Consequently the joint ownership structure and a significant mutual identification towards the wider community, a participative style of management, and a strong learning-based work culture all seem to monitor and underpin the ongoing formation of enabling ad hoc team communities within Unimerco (nationally as well as internationally), and the more new customers are engaged, the more they will call for setting-up such ad-hoc teams, offer opportunity for search and trigger internal learning processes.

This probably explains why the firm has been able to expand into a small multinational with such ease and at low costs over the past decade. Forming an ad hoc team in the Sunds of multiple competencies makes it possible to enter a new market with force, though only gradually employees are recruited in the new country. As a result, more than 80% of the employees in Sunds have already gained foreign experience being engaged in setting up a foreign subsidiary and the big business at Unimerco’s training center today is language courses. Unimerco is turning Sunds into a thoroughly global village.

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*beginning. It increases the understanding of the job and enhances mutual understanding across units. Sometime we even do it [involve production] even though it is not necessary. It clearly pays to spend a couple of hours on an introductory meeting briefing all involved parties. It creates common insight and focus... And engagement and mutual commitment”* (interview Carsten/fieldnotes).

## **2.2. Sauer Danfoss: Conquering the US while being occupied by Americans**

Sauer-Danfoss (SD) produces hydraulic, electro-hydraulic, and electric solutions for the slowly motioning vehicle industry. Its expertise is related to controls and steering, work and propel functions, delivering high-performance components and integrated systems to a wide range of applications. SD with approximately 9,000 employees worldwide and a revenue of more than \$1.7 billion has sales, manufacturing, and engineering capabilities in Europe, the Americas, and the Asia-Pacific region. The Company's executive offices are located near Chicago in Lincolnshire, USA and in Neumünster, Germany.

The history of its making as a multinational is paradoxical. During the 1980s a German company, Sauer, produced in Germany a product licensed from an American company (AC). The product was quite successful in the European market. In the 1990s Sauer began an expansion strategy through mergers and acquisitions, and one of its targets was AC. First Sauer bought 50% of the hydrodynamic division of AC and three years later the remaining 50%. Sauer took over the company under which it had formerly produced under license, and the hydrodynamic division of AC changed from being part of an American company, quoted in the New York Stock Exchange, to be part of the family owned German company.

The Danfoss part in SD is a very different story. Mads Clausen established Danfoss in 1933 as Danish Refrigeration Controls and Apparatus Manufacturer, and as the name indicates, it had originally not much to do with hydrodynamic. Its name changed to Danfoss in 1946. In 1964 the first Danfoss hydraulic product was developed in the headquarters in Nordborg, Southern Jutland, where huge facilities for both Danfoss and Sauer-Danfoss today surround the HQ skyscraper. Between 1990 and 1996 acquisitions in the USA and one in Poland helped bring together global competencies in hydraulics, and in 1998 the fully owned company, Danfoss Fluid Power A/S (DFP), was separated from Danfoss' core business (heat regulation). At the same time the DFP was proving its innovativeness by making radical innovations in valve-technology and introducing team-organization on the factory floor.

In 2000 the German Sauer-Sundstrand and DFP merged into SD to reach sufficient scale and scope to become an important international player. Currently SD is listed on the New York Stock Exchange and on the Frankfurt Stock Exchange, but only limited amounts of shares are traded freely. Two shareholders, the German Murmann family and the Danish Clausen-family, hold each 38.5% of the shares through the company Danfoss Murmann Holding A/S.

When merging, the two companies did not have significant overlapping of products, but made possible mutually beneficial marketing advantages, boosting sales in Europe and the US. Especially sales of Nordborg's products on the American market increased continually. No doubt, two factors were important for this. First, Nordborg's products had a competitive technological advantage. Second, American OEMs saw SD as an American company, run from Chicago. The triumph was that SD was elected a John Deere supplier, and later, in 2001, was recognized as Supplier of the Year by John Deere Dubuque Works in Deere's Achieving Excellence Process. This position opened the market towards other American OEMs, for instance Caterpillar, also producing slowly motioning vehicles. Nordborg's SD employment grew from 700 in 2000 to its current 1,400 employees, basically absorbing the number

of workers and factory facilities that were left as Danfoss itself simultaneously engaged in global investment and outsourcing.

### **Conquering the American Market by changing work organization in Nordborg**

To enter the American market was a major new challenge to the production processes of the Danish company. Before the merger Nordborg had a myriad of customers, requiring distinct and customized products, varying from very small to large batches. The same customer could ask for batches of different sizes and types of products, varying from half a dozen to hundreds of pieces. Production was organized to deliver to these customers and to adapt to demand curves in a quite flexible way. In the late 1990s DFP had engaged in deliberate attempts to increase quality and lower costs by experimentally forming teams and engaging employees in extensive further training. Around the time of the merger this approach had been systematically cultivated in an advanced organizational template aiming at gaining from continuous improvements on the team level. Furthermore, a very elaborate system for trans-team work groups was established on issues such as internal work environment, quality improvements, external- and internal logistics, etc. A system, no doubt, that was very important for creating the level of quality and low costs that made it possible to conquer the first inches of American territory. In this first period SD in Nordborg became very profitable indeed.

However, the American customers were few but large and important, though based on just-in-time they were also producing in much larger batches. They demanded fewer product variants in larger amounts. Thus, the Danish factories should both handle hundreds of European customers and different products, and deliver to large American customers a few products in large batches. The explosive demand and fast increasing share of the American market created a permanent pressure on production. The Danish factories became victims of their own success. It was difficult for the Danish sites to deliver to the American market in a just-in-time system and many products were transported by air, destroying cost-effectiveness. The factories were growing very fast by hiring several hundreds of new production employees, most of which lacked necessary qualifications for engaging in high-performance, autonomous teams. Defects and turnover rate among employees increased. In spite of that the factory was able maintain the high quality level. But only at the expense of increasing costs that could not be absorbed by increasing prices, as SD was contractually determined to reduce prices by 2% annually, which is norm for American OEMs.

To approach these problems with lean methodologies seemed obvious for SD: mass production allied with quality, standardization and flexibility. Elements were already integrated in the approach taken. But where organizational changes had always been a negotiated co-designing process in the Danish company, the occupational forces of the Americans tried now to make a difference.

### **Occupational forces and the resistance movement**

The Nordborg plant being no longer part of the HQs of a large Danish multinational, but – to the Americans – just another subsidiary among many in a MNC, which by its listings in NY and Frankfurt was obligated by new forms of accountability. HR-management was transferred to Chicago, and two American vice-presidents were chosen to manage Nordborg. Local HR-policies based on Danish industrial relations were substituted by a common international policy designed in the US. According to Danish managers this was far from ideal since HR-policies of different European countries were created to fit local institutional and cultural environments. Local training systems, employment rights

and levels of regulation ask for distinctive responses, which can hardly be achieved in a common international policy<sup>11</sup>.

Performance measures also changed. By securing just-in-time information, management could better control daily operations: the production flow, the number of quality problems, levels of buffers, etc. A huge amount of data started flowing daily from production to top managers, where it had previously more been oriented towards horizontal flows. This triggered a change, not only in the organization as such, but also in the negotiating mode of organizing.

In the new management system a small but increasing part of managerial salaries depends on the performance of their respective departments. Once goals are set, the managers try to show up with the best results also to obtain new investments. It boosts individual competition among managers, and makes difficult to improve on collective results of the entire firm, and several managers found this to impede the development of synergies. This made it difficult in a coordinated way to move forward towards a more systematically adapted form of the lean system.

Instead, managers, shop stewards and workers have engaged in an informal and differentiated process of experimentation, adaptation and change. The process is not entirely disordered, as it is being worded in the world of 'lean' and having benchmarks of common reference. If middle managers are playing more individualistic games mutually, they are in need of co-operation from their shop floors in order to achieve own benchmarks, becoming dependent of alliances and coalitions with lower level managers, shop stewards and workers within departments.

Union clubs, shop stewards, the convenor and the works council often work against such tendencies in Danish companies, which we shall also see later in the cases that follow, and create a negotiating order and compensatory horizontal organization that fosters the larger "we" against the formation of small kingdoms. However, American managers in Denmark seemed victimized by the general US hostility towards unions and employee representation in MNCs (Ferner et al 2005). Despite a former strong partnership between the convenor and the CEO and a tradition for integrated bargaining, the new American managers were convinced that trade union representatives in Denmark, as in any other country, would be preoccupied with employment, wages, and working conditions. They also assumed a Danish company to be managed and changed as in the US. The big difference was, according one of the American vice-presidents, to change from 'being the headquarters' to 'being just another subsidiary'. The newly elected convenor, was not able to convince the American managers of the differences between the two industrial relations systems and the possible advantages of employee participation in building co-operative relations between managers and employees and across departments. Instead they mutually developed distrust and adopted traditional positions of opposing interests. The Americans became convinced that they had been right from the beginning and the union representatives started to see in them "American Imperialists". However, the partnership between shop stewards and Danish managers was resistant to these changes, as a previous convenor had succeeded in decentralizing partnerships to lower levels, where it survived, while the partnership between the new convenor and the top management ended. As the American managers did not share relevant

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<sup>11</sup> Danish managers accused American managers of having a very weak international experience. As a Danish manager stated: "When we had meetings in Europe several of the Americans should ask for a passport first, can you imagine? They are international managers who never before traveled to other countries".

information, his option was to insist on reinforcement of and compliance with the general agreement. The American managers only shared information that they considered appropriate, but not to the normal extent enabling the two groups to collaborate and develop general strategies and ease implementation. Lower level managers and shop stewards agreed that there was no information flow from the top in the new system, and in return they provided information only on request.

In spite of all, the decentralization has resulted in the initiation of attempts for improvement. The sub-factories are now organized by and making use of lean in different ways and in distinct stages of implementation. However, it is difficult to see any convergence among them.

There are many additional reasons for this situation. The introduction of lean principles continues simultaneously with the introduction of new technologies on a massive scale to produce faster and expand capacity as huge investments have followed in the wake of the merger. At the same time, the American managers have proclaimed outsourcing on a massive scale, and initiated an unsettled discussion about the division of labor among subsidiaries. Benchmarks are seen as devices for enabling decisions. But when everything is changed, the foundations for benchmarking are not easily detectable.

An important element in lean manufacturing at Sauer-Danfoss is “value-stream” focus. The principle is to understand nearly every step in a product's development, its "value stream". This knowledge is thought to facilitate the avoidance of production bottlenecks and to identify processes that, because they do not directly increase value to the final product, can be outsourced. In order to reduce bottlenecks, new tools and techniques must be incorporated into the process as part of continuous efforts to cut costs and improve quality. This overall idea has been enacted in different ways in the departments and factories of SD, as the understanding of the lean concepts and their consequences have been left to a process, where different groups have tried to make sense of these concepts individually in their sections<sup>12</sup>.

The result was uncertainty as to how to proceed in order to implement lean production. The Danish managers have lacked thorough discussions about the possible effects of and alternatives for changes, but they have generally been convinced of the advantages of re-organizing the factories after lean principles. Therefore the introduction of lean principles has been complicated by the organizational differences among sectors in the factories and the different ways in which the sections have tried to solve the problems.

### **Many small worlds**

Consequently a visitor will find many very different small worlds within the confines of the factories.

Some sections function as small workshops, produce in very small batches and assemble a rich variety of motors. Workers perform many tasks and are able to work at most workstations. They receive specifications and amounts of pieces for production, plan themselves how to best distribute among each other the production of different motors. Nobody is supervising their work, which seems based on

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<sup>12</sup> “In the beginning, when they (the managers) started to talk about LEAN, it was quite confusing. I started to ask people, to look for help outside, because nobody here could explain it to me. I asked at the AMU() center also, and I got some clarification from my external network, people who attend a course with me, when I was a shop steward.” (Human Resources Consultant).

incredible amounts of tacit knowledge. The process is decomposed into small tasks, which are generally simple, but because there are many variations in the types of products, workers must be flexible in managing daily production, controlling the quality and the flow of products and pieces. Production is not organized in U-cells, work stations are separated by buffers of thousands of different pieces. Most workers are women with high seniority, knowing each other, products and variants well. An engineer explained that some motors have been almost the same for years, even a decade. Some of the materials used change but the recipe is almost the same and there is little innovation. Nothing indicates the use of lean concepts. Yet the leader of the section sees it as one of the best, with low levels of failure, just-in-time delivery and highly flexible workers. This type of team demonstrates a high level of 'social maturity' (Kuipers and Witte, 2005).

Another section assembles larger motors, also in a vast number of variants, but within a different organization and with different technology. When an order enters, a worker types its code and number to be assembled in the computer system. The electronic display shows, as in a power point presentation, the correct order of assembling pieces. At the end of the line a machine controls the quality. The worker, who operates it, adjusts the motor, enters the code related to the motor and the machine controls the quality and sends the results to a database. Workers do not need much expertise to work in this line. They are all young men, who have been in the company from few months to less than two years, with no intention of staying with the company. However, assembly stations and the line has been developed in a tight interplay of co-design among experienced workers, technicians and external machine-suppliers to allow for unskilled but very flexible production and thus provide a template for how to master fast growth and to outsource flexible work tasks. A young technician, involved in the team, managed by the R&D department, that developed the line and the quality control machine, is now doing improvements, and also representing a very different working career<sup>13</sup> than the normal workers, which no longer engage in continuous improvements.

A few meters from the high tech line, workers take care of CNC and CAD-CAM machines, differing in age, type and level of technology. Few workers can operate many different machines and they therefore work in areas with similar machines. The section has tried to gain more flexibility by having workers operate different types of machines. Some machines are highly automated, workers just feed them every few minutes, and the job is very repetitive. As a worker explains:

*"This is a terrible job, it is just the same all the time. But I'm fine with it because I just need 25 months to retire, just 25 months, so I can deal with it. But look, these young guys here, they think that it is fine because the salary is good, but the salary will be the same forever, until they retire. There is no change: the same job, the same salary. I feel like I'm in a cage. They ( young special workers) buy a house, they buy a car, and then become dependent on their jobs to pay all the bills and then they can not study anymore"*<sup>14</sup>

Actually, he was trying advise the younger workers to avoid the traps that exists in any system by pointing out all the options that is in the firm to move to more challenging jobs. Thus in the same

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<sup>13</sup> "I was educated as a skilled worker, an automation mechanic, and during my apprenticeship I was working at Danfoss. When I finished my education, I did not work as a skilled worker. I decided that I would like to learn more, so I took an education as a technician, and then came back to Danfoss, and started to work at the R&D department. In a few years from now I intend do take an education as a engineer, right now I'm gaining professional experience." ()

<sup>14</sup> From RRs field notes

section, a specialized worker is busy operating three complex CNC machines simultaneously. He has attended 15 courses in machine-operation, quality control and programming after he started in the factory 15 years ago. His latest wish is a course on forklift truck driving, as he cares about his future employability:

*“I like and I need to be moving, to get new challenges. I can operate most machines in this and even in other sections. I have learnt how to program the machines, and there is a lot to learn about this kind of machine. I like to work with it. But I need to prepare myself to a different situation, because who knows what the future will bring?”*<sup>15</sup>

The team leader confirms the large variation of the section and some workers are quite flexible, which the company rewards with wage increases (up to 20 per cent). Others are not flexible or interested in developing their skills, being placed at more simple workstations. Though the Americans have in general abandoned further training, skill development in this section is a joint concern of the shop steward and the team leader, who are continually searching for existing and new courses. For special workers further training is just an option, for skilled an obligation and seen as necessary for keeping the job with changing technologies and fading boundaries to technicians. Fading boundaries also open the space for specialized workers that engage in training. Many special workers have in this way accumulated sufficient knowledge and know-how to challenge even more offensive skilled workers, and sometimes a skilled is degraded to a specialized worker, which is seen to be acceptable as salary differences are minimal.

In “the smart controls” factory the implementation of lean production is more advanced and the concepts of just-in-time and continuous flow easily detectable. The workers have been trained at different workstations in lean techniques, quality control, and CNC operation through a great variety of courses. Lines are organized in small flexible teams with no team leaders but a general supervisor. Seniority varies from a few months to a couple of years. Standardization and continuous improvement are the current targets for many teams. The supervisor/shop steward partnership plays a central role in this line, too, providing resources and access to courses and negotiating the continuous improvement process. Together they have negotiated goals with upper managers and spent months co-designing the framework for lean concepts. Main focus has been to implement continuous improvement by upgrading the skills of special workers with little experience. The supervisor is a former schoolteacher, who reproduces his approach as a teacher towards the special workers, who are treated as going through a learning process with the main aim of reaching ‘technical proficiency’.

The above examples suffice in illustrating the variation of the factory and the difficulties in introducing a coherent template. It makes it difficult to exchange standardized information and compare performance. Little information flows across horizontal boundaries but rather from units to the top. This information is about magnitude and time, while the ‘soft’ information about processes, through which these results have been achieved, is not flowing. To many, the flow of information is not necessarily linked with communication and mutual understanding, as strategies from higher levels are communicated but not negotiated. Strategies at shop floor and middle levels are negotiated but not communicated to the top. Thus many boundaries and filters in the organization have recently been constructed. The old scheme of systematic communication among teams has weakened. Now a small group can form a team and become almost insulated from the surroundings. Teams are to a great extent

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<sup>15</sup> From RRs field notes

independent of other groups in the factory. Overall the systematic procedure for team formation seems to be temporarily suspended. Meeting short-term demands and deadlines has become the preoccupation. With the American occupation few are trying to imagine a clear picture of what the future of SD in Nordborg will look like.

### **2.3. The Danish Spirit factory (DSF)**

The Danish Spirit Factory (DSF) is located in Svendborg, a town in Fünen, and is specialized in bottling, storing and distributing different types of spirit and wines. During the last decades the factory has been sold three times, and belongs now to a Swedish State owned multinational (System-bolaget). This position and tough market competition forces it to maintain high quality and continuous cost reductions. Wine conditioning, transportation and bottling must be handled so that taste, alcoholic degree, color and transparency do not deteriorate, and low prices are important for consumers. Thus the situation pressurizes profit margins, reducing possibilities for expensive operational solutions, though the variety of products handled is extensive. Danish wage levels mean a need for continuous improvement in the use of machinery, reduction in operational costs and permanent monitoring of product quality. Recently competition tightened further, as an over capacity in the Nordic countries intensified competition among subsidiaries of the Swedish multinational. A process of rivalry and negotiations over setting and meeting benchmarks among the different plants in Finland, Sweden and Denmark was used to contest and evaluate the comparative advantages of each factory. Some relocation of production was necessary, but how to organize production and which sites to close were unclear. Setting benchmarks was a complex task, having to take into consideration e.g. variations in regional marketing position, production capacity, location in relation to consumer markets and flexibility. Many of these variables were not controlled by local sites, which mainly could improve on productivity, quality and cost-reduction. For two years uncertainty prevailed about which of the factories should be closed. Another Danish site was closed recently and had partly been relocated to Svendborg. Below, we narrate its efforts to improve its position in the multinational.

#### **Organizing under collective uncertainty**

Winning a benchmark rivalry under great uncertainty poses a real challenge. The subsidiary called for the employees to do their utmost, though they are facing possible unemployment. Svendborg had experienced many plant closures and many of the DSFs employees had experienced several lay-offs so they had a high propensity to search for new jobs in other enterprises. Thus, during our first visit, the workers were clearly divided into two camps. The 'lukewarms' that did not really engage in the fight for the plant's future and the 'entrepreneurial' that had committed themselves to fighting on the doorsteps for its survival. Old class-divisions such as those between managers and workers seemed to mean less than this divide. Yet the two opposite strategies for workers could be united in a joint strategy of radical skill improvements, as this strategy would increase both the chances of getting a job outside the plant and the capabilities to improve and innovate processes, quality and products from within. Finally, an extensive skill improvement strategy might even tie more ambitious lukewarm workers to the plant, despite favorable offers from external firms. The strategy of skill improvement had developed gradually over many years, actually since the plant had been traded for the second time, five years ago. Thus it was already integrated with and re-enforced by a team-organization that had evolved since then. It just had to be re-evoked.

Obviously very few managers might in isolation feel tempted to solve episodes of great uncertainty by investing heavily in a workforce that would soon be laid off. As we saw in SD, American managers resisted such a strategy. However, as in other Danish cases (Kristensen and Zeitlin, 2005) this policy was created by the formation of very extensive partnerships focused around the works council among shop stewards and managers with repercussions to the larger municipality, training institutions and consultancies<sup>16</sup>. The turn around process through these partners could be organized in itself through a course for managers and workers that in this way started working more closely together:

*“The course was a four days long seminar. It started with the site manager talking openly about our situation...we had some group work, but in the end, the intention was that everyone should go home and start to think about how to improve our daily work, about the things that could improve the production... We produced a catalogue with 5 to 6 hundred suggestions for improvement...we could almost have build a new factory.. But the most important thing was that it became clear that working together we could better meet the new challenges of the future.” (HR Managerin DSF)*

A very active convenor used the situation to create a route of connectivity between teams, increasing individual autonomy, responsibility, and skills improvement that would serve their holders on both the internal- and external labor market. For instance 21 unskilled workers initiated and accomplished a 2½ years education as industrial operators<sup>17</sup>. Both shop stewards and managers went through courses and workshops in teambuilding making it easier to change from distributive to integrated bargaining in mutual relations. By creating this strategy the convenor simultaneously carved out a space between the operative teams and the managerial hierarchy, where employee representatives could recruit and maintain excellent collaborative relations with lower managers and create a partnership that enabled them to fight jointly and vigorously for the survival of the plant. Shop stewards also took a new position to their members, e.g. by supporting equal pay and bonus for all employees, being convinced that inequality in salary and bonus could generate so many problems among and within teams that it would compromise the whole idea of team organization:

*“...of course there are always the liberals asking for salary differentiation among employees, but my work is to avoid that these differences emerge among employees... for example, some workers who receive the industrial operators diploma think that they should earn more money. I am totally against this idea. They receive organizational and state support to take an education and they receive several months of salary during their education, why should they receive more money when returning to work?”(Interview with Convenor).*

The factory could easily be organized after Tayloristic principles, as the filling of bottles is very repetitive and it is possible to assign workers to such jobs under high unemployment. Workers with 10 years of seniority tell stories about old times, when many more people worked in this way with quite similar technology. Work was divided into minor tasks among more people and divisions among different work groups were strong. The shop floor had three different categories: unskilled and skilled,

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<sup>16</sup> *“At this point, the work council realized that the sale of the factory was sure, but whether the site should also be closed down was not decided yet...but we did not intent to sit down and wait. The work council went to the management and started to discus what we as a community could do. It was a really unique situation. It meant that we started to talk to the local education center (AMU) about how we could improve our situation. At the same time, we made contact to a private consultancy firm, which had no experience with educating production workers but we challenged them to help us...it took time and as quite difficult, but we were able to create a course together” (HR Manager)*

<sup>17</sup> An education, which we shall return to below.

the latter divided in machine setting and maintenance. A supervisor planned and controlled production. Now new organizational forms linked to information technology serve decentralized autonomous work teams. Divisions between categories of workers are disappearing and skills are changing rapidly. Skilled workers are not doing machine setting anymore. The number of workers per line has been reduced by more than 70 % in some areas; while productivity per employee has increased up to 80% in one decade. Productivity gains differ, but all lines have improved. To keep operational costs decreasing, the number of operational hours has been brought up from 42% to 62% and in some lines from 42% to 70% of the gross possible within three years. Some teams aspire for 80%, which is impressive given that lines are often reset for shifting batches. The organization of teams provides the explanation for these performance improvements.

The structuration of the community of teams and their ties is not a once and for all settlement. Teams, convenor and managers are constantly negotiating new ordering and principles. Today, there are different types of teams and the aim is that all workers participate in at least two types. The *social team* is the group working around the same production line. In the *technical team*, workers across lines train each other to run each other's machines. *Cross-functional teams* are created on an ad hoc basis, e.g. when line workers and technicians are planning and developing a new production line. Ad hoc teams are generally short term oriented, trying to solve major technical problems. This organic form of working is further reinforced by the constant creation of committees and councils, that try coordinate new policies across teams. At the time we asked the convenor about these, he was gradually able to list 18 different committees, many of which were working with works council sub-themes, but with involvement of team members on a broad scale together with managers and shop stewards. It is a proper indication of how a negotiating order has been established to constantly renegotiate organizational changes and re-defining roles within a plant that one would expect to be very routine and stable.

The *production line/social team* is the workers main belonging, where they perform most tasks in collaboration. Mutual understanding and cooperation is highly elaborated and they often cooperate, plan and divide tasks in silence. The social team was created to facilitate learning among workers, in order to improve performance, reduce conflicts and avoid harassments. The team is responsible for hiring new members, and to get the best workers they compete mutually to gain reputation and be attractive.

One way for workers to measure how radically work organization has changed is when newly recruits or entirely new teams are brought to function in this environment. Whereas earlier it was quite easy to learn the jobs, this is now much more difficult. In the first phase, individuals face enough difficulties learning how to use and improve skills, create roles in the team and establish relations among teams. During such periods the older teams demonstrate their comparative capacity to solve non-routine problems, focus on continuous improvements, collaboration across team boundaries and their ability to make use of a variety of resources - institutional and organizational.

Crucial for success is to have lines running continuously, do maintenance and repair on the spot by operatives to the largest extent and reduce re-setting time. The workers are responsible for the whole production process. Their tasks comprise production planning for the next weeks, organizing the production of different types of wines and cleaning the system. They are in close contact with sales and production planning to avoid unnecessary cleaning and best prepare operations. They connect wine

tankers to production lines, where small mistakes can be very costly in terms of time and resources. They do chemical analyses to evaluate product characteristics and sensibility to be able to keep the quality of the product under processing. Finally, they receive trainees under education as industrial operators. It seems as if the electrical system is the only “no go area” for operatives:

*“I have freedom to solve as many problems as I can, the only forbidden thing is the electrical equipment, which is exclusively for electricians. Any other problem, which shows up: if I can solve it, I am free to do so. Only if I cannot solve it, or I am uncertain about it, I ask for help. The mechanic was here fixing something, because I was not sure about the problem; but if I were, I could have replaced the piece without any problem.”* (special worker, from field notes).

*Technical teams* allow for crossovers and multi-skilling. For example, packing machines are quite complex to operate and it takes several months to master all operations. To increase functional flexibility across lines, workers form shifting two-member teams, where they over 14 days instruct one another in their machines and related work tasks. This rotation scheme does not only allow for technical multi-skilling, but creates cross-line knowledge, mutual understanding and install a practice for experimental role-shifts. To many, this is very cumbersome and frightening and therefore most workers are trained in group-work and team-formation at the local training center. Not all workers are able to work across lines and different teams but the process is progressing, the results are continually evaluated and new suggestions for improvement are collected. Technical teams solve several problems. Workers, with different knowledge, work together and shift roles between teacher and student, thereby reducing power inequalities that could emerge in more static relations. By working in several teams of different types and with different goals, workers are able to build a network of relations across lines, departments and hierarchical levels. In this way, they empower their internal networks and at the same time facilitate the flow of cross-departmental and functional information, whereby teams avoid encapsulating themselves from being able to learn from improvements in others. Workers develop higher levels of reliable flexibility<sup>18</sup> and increase their employability. By crossing team boundaries, the workers have access to a clear picture of what is really going on both inside and outside their social teams.

Two of eight workers in a distinct social team are also involved in the development of a new, similar production line. They participate in a *project team*, working together with engineers and technicians to design it. They participate in visits to sub contractors who are building the new line, test the machines, make suggestions for improvements and try figure out possible failures. By moving across different departments these workers become inter-connected and connect people across functional areas, exchange information, gain new knowledge, take responsibility, participate in decision making and adapt to the experimental mode of the plant, which may mean taking wrong decisions and producing mistakes without being condemned.

In this organization, the role of supervisors is unclear, but they are still present though in smaller numbers. The process leader has become a human resource coordinator for the teams rather than being responsible for technical questions. He evaluates which skills different workers possess, how to improve team formation and help the workers in skill development. Close supervision is not prevalent in the factory anymore:

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<sup>18</sup> By reliable flexibility we mean the possibility to operate several machines with a deep tacit and technical knowledge of the operations. This would be a contrast to a “flexibility by heart” when the worker can operate a machine without a deep understanding of what he is doing.

*“ I just ask for help from my process leader, when there is a problem that I or other workers in the team cannot solve. Before, there were other people, who solved problems. Now we have each other in the team. For example, we used not to know the tasks before coming to work. We would have to wait for the supervisor to list the tasks to be performed during the day, but now we know these weeks in advance. Thus, we know which machines to prepare. The supervisor just comes around and says “good morning, any problems?” We do not see each other very often, I really do not know what the process leader is doing”. (special worker, WIP)*

Instead of controlling the operations and workers, the new process leaders are addressing issues related to team members' roles, skill development, and replacement of team members and cross-lines training. *“I am more inclined to use the more modern role of a process leader... coaching the worker's involvement. Sometimes I must examine them, more like the old supervisor. My work as a process leader is a mixture of the old and the new type of supervisor, sometime we negotiate and sometime we decide, ... some workers are not able to make a decision...”(process leader).*

As special workers have continually gained space in the plant by continually upgrading skills, they have also assumed more of the skilled workers' tasks in the factory. Changes in the division and organization of work in the factory have created a complex picture, where the boundaries between skilled, non-skilled, white- and blue-collar jobs become unclear. Unskilled jobs are few in the factory. It is difficult specifying what the skills are, and which skills are necessary for jobs, but it is telling that we did not speak with a single worker that found his job uninteresting.

A quite common trajectory for workers in DSF is that they first had a career in a specific craft outside the company, then they decided to change towards a less demanding job in terms of working hours and stress in DSF. Some took the job for more involuntary reasons, for example, when being laid off from other companies. But even when demand for their original craft became better, most of them decided to remain in the factory, since their jobs were more interesting than they had expected and differences in salary small. DSF satisfies more aspirations than expected from a “factory”:

*“ I got a job here after working as a mechanic in a small shop. I got tired of seeing the same people every day and after some time in the factory I was earning more money as a special worker than as a mechanic. People ask me how I can accept a factory job after using many years of training as a mechanic, but a factory job where you do the same movements every day is not what we have here. I'm solving problems all the time. I'm helping people. Sometimes, maintenance workers make jokes about my job and they try to push me aside. But when people in the line cannot solve a problem, they first look to me for help, not to the maintenance workers.” ()*

This means that a lot of the “formally” unskilled, specialized workers' jobs are in fact held by skilled and that makes a difference:

*“ A skilled worker working in the line as a special worker is not the same as a special worker. They (the skilled workers) are more prone to experimenting, they are not afraid of trying something”. (process leader)*

There is space for experimentation and there is support for those who are not confident in experimenting, but it is difficult to find space for people, who are not committed, hard working and contributing to the collective success. The factory has become an attractive social space for employees that would formerly hate a normal factory job. For instance, high-school dropouts, failed engineers,

former cabinet-makers, etc., are to be found on its floor. The factory becomes a space for very different people. Let us illustrate this with two working careers.

John is 48 years old: *“I was educated in the agricultural sector. I worked in farms for several years, but wanted to try something new. Then there was an opportunity in a municipal school, which had some animals. I should take care of them and show them to children, who visited the school. It was a nice and interesting job, but with changes in the municipality, the little farm in the school was closed and I lost the job, and found another in DSF. I learned to operate several machines, and now I’m considering the possibility to become an industrial operator. I like the job I have here.”* (from RR field notes).

Another crossed the white/blue divide: *“I was educated in a commercial school, but after some years with a lot of office work, I got bored. I searched for a more interesting job, but it was hard to find at that time, and then the firm, where I was employed, closed down. I could not find another white-collar job, not to say a more interesting one, and I accepted the idea of working in a factory; but this is different from what I expected... I really like it. It is possible to learn all the time, and now I can operate several different machines. Right now I’m in the office writing the operation manuals<sup>19</sup> to the machines I operate. The intention is to have manuals for the machines and my process leader asked whether I would like to write them. I accepted, so during part of the week, I sit here and write the manuals instead of working on the shop floor.”*( )

It may be argued that the factory has become post-Fordist: blurred boundaries between work groups, where specialized workers participate in planning, take care of a variety of tasks which requires a variety of skills (preparation, servicing, quality and process control) and are not under strict supervision. However, others could also see it as bureaucratization: flow of information is continuous, the measures of performance are stringent. Control of supervisors is not necessary anymore because governance is embedded in technology. By the end of the day it is easy to evaluate how hard workers have been working, and how fast they were resetting machines. Bad performances must be justified. The continuous improvements in how to measure performance, the identification and precision in performance of tasks and the just-in-time information could easily be characterized as intensified bureaucratization. There is a greater precision of results expected, more extensive accountable management reporting and all information seems to be driven in the direction of a more rigorous account of results and costs.

However, the flow of information is seen as a positive change and is generally linked to the idea of commitment: *“not leaving the brain at the factory gate anymore”* (special worker, RR field notes). By continually analyzing their performance and achievements, the teams may reconsider new skills that members need. The participation of the work force explains why these changes are not understood as a tighter control over workers. Workers are not only able to control their own performance, but are given a deeper understanding of the economic performance of the whole organization. In this way, they have

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<sup>19</sup> A interesting characteristic of these new machines is that the manuals are written by the workers who operate them. Because of the co-design, workers participate in the construction of these machines and the system, which continually gain new features. Thus a manual which could describe their operations is not found and some workers periodically re-write new manuals where the different paths to prepare a machine are presented. In these manuals fine operation details are not only related to the preparation of machines but also to the quality control measures necessary to an effective process. This is the type of task that one would have expected to be performed by an industrial technician, not a special worker.

become more aware of international competition, the importance of the firm's performance for survival and how this performance is linked to their performance. The continuous flow of information supports the processes of mutual justification and the understanding of reasons for actions and strategies. But if targets are met, workers also expect to be remunerated. The annual bonus, which is equally divided among all employees, serves a purpose. Paradoxically, workers despite much electronic supervision, feel much more freedom than before, where tight direct personal control, a more straight division of tasks and roles joined with a more individual mode of performance measurement.

## **2.4. Radiometer: The Jewel in the Crown going “Subsidiary”!**<sup>20</sup>

Radiometer (RM) has become the world's leading provider of blood gas analyzers, which measure blood gases and other parameters used to diagnose patients in critical situations, and accessories, IT systems and support services for blood gas testing. RM employs nearly 1,700 people worldwide, and their products are sold in more than 100 countries. Its headquarters are in Copenhagen and its global organization comprises Radiometer A/S, consisting of three product companies: Radiometer Medical ApS, Denmark, SenDx Medical, Inc., US; Radiometer Basel AG, Switzerland, and a number of international sales companies responsible for the worldwide sales and distribution of RM's products and services. Thus the RM-story is about a Danish family-owned company going multinational by developing excellent products and services that make it possible to cultivate close ties to surgery departments in hospitals all over the world.

The new truth of the story, however, is that RM has become a subsidiary. In 2003 Danaher Corporation, a U.S. Fortune 500 company committed to continuous improvement, innovation and growth took over RM. This shift has primarily implied a radical re-organization along Danaher's Lean model.

Radiometer Medical ApS, RM's main product company with more than 800 employees (approx. 450 of them are so-called un-skilled), is located vis-à-vis RM's corporate headquarters, close to Copenhagen city. It is surrounded by an old residential district, a shopping area and close to a beautiful lake. Inside the company the feel of locality, proximity and unity blends with employees continuously acting towards and being in touch with the world.

People at RM express pride and commitment, when talking about their company and work, and do not take their success for granted, but are conscious that the long tradition of successfully improving financial results, finding new and better ways to solve problems and expanding throughout the world was a co-authored process. Thus, the Danaher takeover created new challenges, conditions and re-organizations that stirred up habits and routines, caused new uncertainties and more intensive and constant pressure for innovative changes. Before we take a closer look at RM's present situation as a subsidiary, let us first get a feel for her multinational past.

### **Radiometer's historic roots and strategy**

In 1935 Carl Schröder and Børge Aagaard founded RM to manufacture electronic measuring instruments for the radio industry. By collaboration with Dr Poul Astrup, in 1954 RM could market the world's first commercially available acid-base status instrument (the Astrup Apparatus), which initiated

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<sup>20</sup> [WWW.radiometer.com](http://WWW.radiometer.com)

an era of intensive research and development within blood gas testing. Since hospitals in 1959 started to perform blood gas analyses - the same year as RM introduced the “Astrup Trolley” for PH, P02 and PCO2 measurements - several new generations of blood gas analyzers, alternative instruments and accessories have been developed and released<sup>21</sup>. In this way RM gained and defended a reputation of being vanguard in blood gas testing and a major provider of high-quality and -precision measurement instruments. RM cultivated close collaborative partnerships and ongoing exchanges of know-how with Danish research institutions, such as the Danish National Hospital (Rigshospitalet) and the Carlsberg Laboratories – and explains its ability to be a “first mover” by reference to its reputation and such collaborative partnerships. During the years, when the Danish health system was leading in quality and funding, RM had an ideal home market for innovative performance.

In 1973 a son of one the founders, Johan Schröder, became CEO. Being a Harvard MBA, he caused a shift in focus from engineering to business, making growth in sales rather than innovative performance the target. Through the lenses of the then fashionable Boston-Consulting matrix, Johan saw the blood gas analyzers as the company’s “cash-cow” and when high growth and moderate competition turned into stagnating profits, declining growth and fierce US competition in the 1980s, RM saw a need for new “stars”. He started to acquire companies within new business areas and began to expand and innovate in more proactive and experimenting ways. Much of this strategy failed and proved the viability of blood gas equipment, but the period transformed RM into a much more global and experimental company, focusing on developing, in tight partnerships with leading hospitals and research centers in many parts of the world, new products and services to diagnose critically ill patients.

This way of operating has continued after the take-over. Though blood gas analyzers and production of instruments is the core métier, it also offers a wide range of, for example, liquids, samplers and services such as process analysis, IT systems, quality as well as technical support and training. The market share on analyzers globally amounts to 40%, while it is 97% in Denmark. In 2002, 96% of RM’s turnover derived from export. 21% of the company’s turnover derived from analyzers, 63% stem from accessories, 9% from services, and 7%, from non-RM products. It sells 41% of its turnover on the European, 25% on the US and 19% on the Japanese market<sup>22</sup>.

Co-developing partnerships with colleagues, costumers and suppliers is characteristic of RM. For instance, RM initiates a new customer relation with an analysis of the hospital’s blood gas testing workflow based on dialogue, cooperation and exchange of experiences. The approach is called *The Red System* and is divided into three stages: First, process analysis of costumers needs, testing environment, etc., to identify opportunities for process improvement. Second, design of solution to optimize costumers testing environment, combining analyzers, IT systems and samplers. Third, provision of support in the form of training, QA, supplies of materials and technical support to ensure such degree of customer satisfaction that RM becomes an ongoing partner, helping customers save time and increase productivity ([www.radiometer.com](http://www.radiometer.com) 28-02-07).

These external ties are, as we shall see later, supported by a highly experimentalist work environment inside RM, where everyone is encouraged to explore new ways of continuously improving.

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<sup>21</sup> For further clarification please see [www.radiometer.com/Radiometer](http://www.radiometer.com/Radiometer) milestones

<sup>22</sup> Source of information: [www.knowledgelab.dk/now/shrm/Per%20Krogager.pdf](http://www.knowledgelab.dk/now/shrm/Per%20Krogager.pdf)

### The Coming of a Subsidiary?

The formula of the Red System has not changed after the take-over by Danaher, and neither an economic nor a technical crisis lead to change of ownership. Johan had simply reached retirement, decided to sell, and Danaher offered to buy him out as they saw RM's reputation as a way of carving out an even bigger place for the company in health care in the future.

When Johan left in 2004, Peter Kürstein, another Dane, was appointed CEO and listening to his reflections on strategy in early 2007 is as if you were listening to an autonomous CEO in search of new entrepreneurial challenges:

*"It is our ambition to double our growth in the coming years (from 6.5% to 12.5%). In part by continuing to stake on blood gas, and in part by developing new measurement parameters (e.g. PISA in particular is a field to stake on in the future that involves measurement instruments within other areas than blood gas). We also aim to strongly stake on sales of accessories for our instruments ... The instruments are the driver of selling accessories... But we are in the process of leaving the blood gas bubble ... towards something with which we are less familiar which implies greater uncertainty, but also more possibilities... ... Point of Care (POC) is the market that we are really interested in staking on in the future as opposed to laboratory measurement equipment ... therefore the future is about getting as close as possible to the patient... We have to introduce new parameters... many are in the pipeline for the coming years within the realm of ACUTE CARE. We are not going to construct the fundamental technology ourselves – we will buy it and further develop it into a product. That is the strategy... ... Much higher price pressure characterizes 2006 (e.g. due to German health reforms). So far Radiometer has been spared due to the uniqueness of the products, specialization, and significance, but we expect a growing external price pressure to constitute a fundamental condition in the future. The general transformation figure is a movement from exclusively staking on blood gas to increasingly focusing on also ACUTE CARE ....."*<sup>23</sup>

Like other Danish companies, RM navigates globally with ambiguity, and e.g. the question of outsourcing plays a central role in employee conversations. At the annual strategy meeting several questions pertained to RM's "partnership" with a Polish supplier. But the production manager narrated it rather into a usual experimental adventure:

*"Our collaboration with the Polish factory is an experiment from which we expect to be able to assess whether we should, in the long run, move to low price countries and if so which... We move simple productions to Poland (simultaneously with keeping the same productions in Denmark)... ... that is, parallel productions, which is not outsourcing... ... outsourcing is when you transfer everything... so we are not outsourcing"* (Fritz Nygaard/ strategy meeting 04-01-07).

New owners, outsourcing and coming new products constitute an interesting mixture of high insecurity and novel challenges, from which the employees may potentially gain if they manage to continue improving and innovating. Actually, in a moment of great self-confidence, the convenor welcomed the fusion of Danish collaborative traditions with US ways of organizing internal competition as a way of rejuvenating Radiometer:

*... if we are able to combine the American competitive mentality with our own model of cooperation, I believe that it could be fun. Then in the future, I think, we need an external gallery around the buildings, because people from other Danaher companies will come and watch how we do it.*<sup>24</sup>

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<sup>23</sup> Peter Kürstein, strategy meeting for employees at Radiometer 08-01-07

<sup>24</sup> Annual Report 2004 from the Works Council.

This self-confidence is rooted in (1) a tradition for collaborative co-management between management and trade union representatives, (2) an experimental, team-based work organization made possible by (3) making use of surrounding institutional resources. These three practices have been vital for RM's success and seem to be its assets for future growth. We will, thus, elaborate on the potentials and challenges of these three assets – past, present and future.

### **Collaborative practices between management and trade union representatives**

A long lasting partnership between convenor/shop stewards and top-/production managers has cultivated RM's work organization. This partnership has created the basis for a highly trained and engaged workforce, flexible and with capabilities to respond to internal and external changes in innovative ways. Union representatives have simply been integrated into the management structure – and have changed from distributive - in favor of integrative bargaining in exchange for an offensive up-skilling strategy. Thus, the roles of convener and shop stewards have become directed towards the role as facilitators, problem solvers, mediators, change masters or motivators in the organization<sup>25</sup>. Having had a voice even in creating the strategy of top management, they negotiate this in place with middle managers and employees at all levels, where they can combine strategic goals with personal aspirations much more effectively than any manager. This partnership permeates the organization and manifests itself in a wide range of committees and ad hoc groups across units, departments, management levels, etc. – i.e. arenas where the partners share information, discuss strategies, negotiate, evaluate options and draw on each others knowledge and expertise in an ongoing process<sup>26</sup>.

Although this unique alliance does not encompass all management levels (especially not the middle managers) it has been pivotal, also after becoming part of the Danaher multinational. RM's lean based re-organization process e.g. could not have been successfully implemented without this partnership, which secured employee commitment and co-operation about all changes. The partnership seems to facilitate transformations in very productive ways - which not only engage employees, but also strengthen their abilities to constantly search for and respond to innovative changes. One very central achievement is that the company's co-managing team structure has not eroded. To the contrary, it has become the central prerequisite for successfully implementing Lean principles, though the two often looked contradictory during the process of implementation. So the empowerment of socio-technical teams has been combined with the transparency of Lean – a mix, which has resulted in higher performance without losing employee support (CU 04-01-07).

Collaboration across, ongoing flows of information within and between units (and teams), transparency and delegation are all values that are guarded by both top-managers and union representatives, and their partnership is now highly focused on monitoring the teams' ability to organize dependent on how they benchmark. This art of managing corresponds in a distinctive way to new organizational forms, such as heterarchies, with their ability to innovate and make ongoing exploration and experimentation a general feature throughout the organization (Stark and Girard 2001; Hedlund, 1999).

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<sup>25</sup> Evt. noget mere om hvordan TR-gruppen skaber legitimitet omkring forandningsprocesserne... NB husk denne

<sup>26</sup> E.g. the Dialogue Group (shop steward and management meet regularly to discuss/inform about the internal staffing situation – who wants to be moved, who needs help, etc.), Coach group meetings (shop steward, department managers and section managers meet once a month. The shop steward often renders visible the need to thinking and working across boundaries, and though it seems contradictory, s/he is often the one coaching the managers in that respect. Liaison committee, JOB2 committees, etc. (Field notes 08-01-07).

Top-managers and convener think that one of the crucial future challenges is to nurture a stronger common we-feeling in order to avoid organizational parochialism. The convener expresses the challenge like this: *"We have too much of 'who is most important' and of silo mentality... that is everyone attends to his own business without thinking of the whole... but collaboration across units and sections are imperative and therefore the silos must die!"* (CU 04-01-07). Especially among middle managers there is a widespread tendency only to focus on the needs and short-term goals of ones own section and Danaher's bonus and benchmark system has reinforced this tendency. The system only favors individualistic and section-based performance results instead of joint achievements across sections and units – quite similar to how Sauer Danfoss' award system seems to work, but in RM an offensive partnership is in place to counteract such tendencies and aspiration for wider collaborative practices.

### **Merging experimental team work-practices with Lean-governance**

Salman Rushdie catches quite well how RM's adaptation to Danaher's Lean-rule was far from a simple stringent use of these principles: "A bit of this and a bit of that; that is how newness enters the world". What came out of the process was hybridization (Zeitlin and Herrigel, xxx ) and a new experimental order. However, a clash between two forms of work organization is a dramatic affair - a source of both frustration and dynamic experimentation. But the confluence of former and current work practices has caused re-interpretations of previous work practices and reflection on how to perfect and improve. A team worker expresses it this way:

*"We take from Lean what we can use... that is, we make it work within the specific unit ..... We are good at finding creative solutions when necessary"* (Ib, team worker, 13-02-07).

This attitude reflects that by working in teams, the workers are used to take action, not orders, and search for novel solutions. Since the team organization was introduced several decades ago, it has continually changed with the overall purpose of giving employees increasing influence over the development of work practices (Company materials, CU slides page 5, 23-10-06). Each unit consists of several co-managing teams organized around the unit's specific product lines. The size of the teams varies from 8-15 employees dependent on the complexity and amount of work. After Lean, most product lines have been re-organized into U-cells, and employees have been trained at all workstations – so that they are able to rotate between and support each other in the different cells. Proximity, interdependence, professional and social bonds characterize life within teams/U-cells. Teams take collective pride in mastering their specific work activities, products, competencies and performance results, but in an easygoing way.

Shortly after the acquisition, Danaher introduced Lean principles and expected them implemented within 3 months. All were taught Danaher's Lean principles, while production stopped and stores were reduced. Training included the planning and participation in Kaizen Events to improve managers and employees ability to re-organize towards enhanced efficiency and performance. The top managers in RM took this speedy approach to avoid that Danaher would send an army of 80 "change masters" to enforce its Lean rule on RM (TR JN 13-02-07). The union representatives decided to support the Danish managers, and once again they became partners and took the role of change masters to make the best of the new situation. The production manager met with all the teams in order to clarify and discuss the underlying logic and future strategies of the lean-based re-organization. Union representatives worked out a manual for the co-managing teams that addressed the future roles and rules for teams and collaborative practices. These rules explicated the division of responsibilities, expectations and rights

of employees, union representatives and management in a work environment under constant change, and stated clearly that changes cannot be imposed, but must be negotiated.

Framed by these rules, it is of course still dependent on the creative powers of a multitude to actually make a dynamic team-based work arrangement. In RM, two different “tools” have been used to foster this. The first is the institutionalization of a role-division within teams. The second is a permanent second job (JOB2) arrangement, which invites employees to shift jobs with colleagues across units on a temporary basis in order to learn new skills and competencies that, of course, increase organizational flexibility. As we shall see, this diversity of roles enhances lines of lateral accountability, distribute intelligence and reflexivity within and across team settings.

As a way to develop and monitor work roles that facilitate an experimental and innovative work environment, the company has designed and implemented a role-matrix within each production team that, apart from their operational roles, includes:

- Quality responsible (process employee)
- Coordinator (planner)
- Documentation responsible
- Capacity responsible
- Stock responsible
- Technique responsible
- Education- and training responsible
- Environment responsible
- Information- and IT responsible

Union representatives have developed this set of formal roles in collaboration with managers and employees. To reach the highest degree of flexibility, more than one person within each team must, as a rule, be able to perform each role and employees are encouraged to shift roles. According to the convener and shop stewards the use and institutionalization of these different roles aim at reaching other advantages and objectives as well. This is what is listed in the manual for the co-managing team:

- Clear division of realms of responsibility
- Visibility among the co-managing teams and the environment
- Co-ordination of tasks across groups in own unit, section and in the whole production is facilitated
- Instruction, training, and course activities involving the individual roles can be established
- Information and communication channels become more transparent and thus faster

(Source: manual for co-managing teams 2006)

With explicit roles the division of responsibility becomes more transparent, and across teams and towards the wider surroundings, formal roles facilitate coordination and decentralization of work and authority. Moreover “role masters” with similar responsibilities exchange experiences and ideas across teams – creating a dynamic of learning and innovating across teams. Given that the team members perform the different coordinating roles and often do it by turns, they are all actively engaged in and share responsibility for the tasks and obligations of the nine roles. Through this form of mutual cooperation the individual team member becomes better able to take on the roles of others, reflect on

these and thus become able to contribute with new ideas and suggestions for improvements. Such forms of co-operative role taking and role shifting within teams seem to strengthen the intra-relational learning processes within the team communities. It institutionalizes a new form of competition, as shifting role-masters want to perform as well or better than their predecessors. In order to perform the new roles successfully the team workers must constantly reflect upon former experiences and routines. Furthermore, they must compare and correct the activities pertaining to their role in view of former role masters' or their colleagues' expectations - at the same time as searching for, finding, and evaluating new and better ways to handle the roles. Great learning potentials seem to be anchored in these forms of team practices, since the process of shifting roles and/or taking on new ones inevitably embodies a problematic situation that creates relations of rivalry which trigger the team members' aspirations and abilities to act and think in innovative and improving ways. Striving for recognition and success as a role master seems, in this way, to strengthen the aspirations to learn from previous well performing role masters, and to come up with new ideas and suggestions and actively take part in the team's managerial tasks. In sum, this form of intra and inter-team transactions between roles not only helps to distribute intelligence and know how – but also seems to enable a continuous flow of creating and re-creating new knowledge by institutionalizing lines of communication and coordination among the roles within and across teams.

The institutionalization of shifting jobs reinforces these tendencies. The JOB2 arrangement was implemented 10 years ago, and means that workers are given the opportunity to and are expected to shift jobs across team or units, and many have voluntarily been “expatriated” to a JOB2 more than once. It opens for acquiring new skills and competencies – and increases the functional and numeric flexibility within the organization. Over the years the JOB2 arrangement has been re-adjusted several times. A committee of union representatives, managers and employees are in charge of managing and adjusting the arrangement generally – but the practicalities of job shifts is self-organized by the teams. JOB2 arrangement is used in the following situations:

- Moving and adjusting capacity
- Employees' wishes for new challenges
- To ensure flexibility in relation to bottlenecks and key functions
- To currently expand the ability to change

(Source: Material from the JOB2 committee)

One of the shop stewards describe the genesis and current scope of the JOB2 arrangement in the following way:

*“30% of the labor force move around in JOB2 every day. They do it on a voluntary basis and management has no influence. The JOB2 arrangement has existed since 1995. The idea emerged when we were closing down a spray factory. A works council conference focused on how we could create job security and that we in return had to do something about the flexibility... according to our job security agreement we must move... that is, use JOB2 actively” (TR JN 13-02-07)*

Both workers and managers think that JOB2 is a success. The “tool” increases exchange (of e.g. people, resources, ideas, knowledge) across teams and units, it helps create a “collective conscience” and a collaborative team community across units and skills. In this way new competencies and roles are assembled and mixed on an ongoing basis. The union representatives list the following advantages of the JOB2 arrangement:

- Employee capacity is moveable within 24 hours
- Employees move on a voluntary basis to different units or different shifts
- Capacity within a production area can be increased by 10% within 24 hours
- Employees develop – personally and professionally
- Employees maintain abilities to learn
- Employees are kept in the labor market in spite of changed job conditions
- Employees feel more secure about change
- Job security creates pleasure, motivation and readiness to change
- Conflicts among employees can be solved without dismissals
- Culture and traditions are constantly affected
- Experience is exchanged across the organization.

(Source: Material from JOB2 committee)

Looking at the many advantages listed above as well as recalling the employees' stories about their experiences with shifting jobs, it is obvious that the JOB2 arrangement is a very unique tool that is monitored by the employees without direct management involvement. In many ways the JOB2 arrangement provides the same almost organic, fluid and highly flexible work organization form as Unimerco's ad hoc collaborative team practices. However at RM it is much more institutionalized and initiated and facilitated by the union representatives. But how has the clash between these dynamic co-managing team practices and Danaher's Lean concepts "materialized"?

### **Lean - a two-edged sword**

One of the central mantras of Lean is *to slim the organization* by getting rid of all waste and some of its critics have argued that some "waste" or slack is necessary for triggering innovation. However Lean is also a technique that triggers reflexivity and continuous re-learning, its rational being a constant search for improvements and strive for smarter ways of doing things. From this perspective, Lean is not a fixed concept – but a set of principles always being translated into a specific context. RM's "confrontation" with Danaher's Lean model is no exception. The pure model has resulted in the introduction and implementation of a set of Lean principles throughout the organization. All teams are using classic Lean concepts, such as Kanban, Kaizen and Six Sigma, but the actual ways in which these principles are being performed varies among different units and teams. This kind of diversity precisely illustrates that RM deals with Lean in a very pragmatic and flexible way – trying to integrate the useful while de-selecting bits and pieces. The following quotations demonstrate how people cope with and mediate between the two faces of lean in their daily practices:

*"Lean is a two-edged sword..... it carries a good deal of advantages, but it also has certain dead angles when things are not working according to the plan – and they don't in nine of ten cases! Therefore much of Lean is also highly irrational. For example I don't understand the zeal for speed – for while speeding up the pace you make lots of mistakes – so in a long-term perspective running faster and faster is not quite as efficient as the Lean concepts and its logic of effectiveness pleads"* (CU 04-01-07)

*"The Lean principle distinguishes between materials, machines, and humans. That is fine, it makes the division of labor clear. In the groups of shop stewards we merely need to take care of the human dimension and make sure that the labor force in production is flexible and qualified. The problem is that when the machines cause problems or there are not sufficient materials, it manifests itself as grit"*

*in the human machinery. Therefore it is not possible to distinguish meaningfully between the three dimensions” (CU 04-01-07).*

*”The Lean system is good for revealing problems but there are no resources for resolving them” (Ivan, employee 13-02-07)*

In the beginning the employees were very frustrated, as it was extremely difficult to find a meaning with the new concept and to realize the benefits of the lean-based re-organization. Gradually, they have discovered some of its advantages (such as reduced waste, better results, transparency, etc.) and today most express mixed views. But it is not the principles of Lean that set their aspirations and triggers their pride:

*”It is the black magic that we are doing that makes it fun to work here... that is what makes work exiting... we often have to extinguish many fires to achieve the desired result... Pride has much to do with delivering on time with high quality... When we are allowed to run it, it runs much better – not to be smug, but that is just how it is” (Ivan, employee 13-02-07)*

Thus one lesson that seems to crystallize from within the realm of Radiometer is that it is precisely the very mix of a little bit of this and a little bit of that enables the organization and its people to move and grow continuously. In this landscape of confused principles newness easily seems to enter the world since it gives rise to ongoing processes of re-combining resources in new and productive ways. And Lean is no exception.

## **2.5. Institutional foundations for work-system changes: Innovating the use of institutions**

It is a commonplace finding in our field studies of Danish firms that under critical episodes (risks of closure, manpower reduction, etc.), the industrial relation system helps shape partnership between convenors, shop stewards and top- and production managers. This facilitates negotiation of strategies, evaluation of options and information sharing enabling decision about which route to take – as we saw in both DSF and Radiometer – and we have found such negotiating partnerships in numerous other firms (Kristensen and Zeitlin, 2005; Kristensen, 2003). Often when such partnerships are less visible as in the case of Unimerco – and we also found this to be the case of in other, foreign owned, firms – it is because management has internalized the interests of employees in how they have managed and organized their companies. This is quite a remarkable shift that has happened after the first oil crisis. Up to then the dominant negotiating field was the centralized bargaining institutions, where unions and employers associations met and negotiated in gross terms nearly all issues that would govern each their members attitudes to opponents at the local firm level. Today, central negotiations sets a framework for negotiations at firm level and it is at this level that experiments and explorations of new organizational forms, wage systems, and collaborative governance systems becomes constructed. However, the strong position of shop stewards, convenors and work councils are themselves outcomes of and being regulated by negotiations among the national associations and corporatist levels.

As we have seen in a number of cases, the partnerships at firm levels often involves some form of profit-sharing, most predominantly in the case of Unimerco. But such schemes can be found in

numerous variants in different firms, also those owned by foreign multinationals. A good example is the train-factory in Randers owned by Canadian Bombardier. Here the teams, responsible for producing entire orders of trains for given customers, are given the freedom to manage themselves their entire business. They know the budgeted costs in advance, and if they are able to make cost-reductions, the team will keep 50% of the gain for themselves, while the subsidiary as such gets the remaining sum. The team is then able to decide quite autonomously how it will spend the bonus it has gained (hiring more workers, send people to further training or take out the gain in the form of increased wages).

However, it is obvious that in the late 1980s and the 1990s profit-sharing increasingly took the form of increases in further training, distribution of pc's to employees, etc. so that the employees at different levels became increasingly capable of expanding their skill-assets at a time, when the labour market was looking threatening, both in terms of new technology and increasing globalization. As the Danish welfare state co-financed workers salaries under training and grossly paid for many a training-course, this way of doing profit sharing became a very favourable way of joining interests between labour and capital and stimulated, no doubt, the formation of firm-level partnerships and a move towards integrative instead of distributive bargaining.

Such partnerships, as we have seen, in turn enable firms to undertake radical changes of the workplace by heavily committing workers, even in moments when employment prospects look bleak. The great achievement of these partnerships have been to engage even the best workers in these transformations, though they would - everything else being equal - try to find employment in other firms. The secret weapon has been further training for unskilled workers and upward. The effect has nearly everywhere been to engage employees in enduring and stable training programs codified in local agreements between the partners, and in a first radical and then continuous decentralization of responsibility to those that execute tasks at all levels of the firm. Combining the intangible tacit knowledge from previous work practices with new technological skills or perspectives for how work organization may be shaped in alternative ways, how teams are constructed and work, etc., helps creating a workforce that in itself is pushing for improvements, constantly searching for and responding to changes. In effect personal identities gradually come to comprise larger sets of roles and factories become more like experimental laboratories than cages of stable routines. Such experimental laboratories may, however, both develop into communities of teams with intensive interactions or become isolated islands in a sea.

Within this general pattern we find a huge variety both in how firms make use of institutions and in how these have repercussions on and allow for internal organizational evolution unanticipated from the outset. Below we will investigate a variety of these interactions and co-evolutions between firms and institutions, primarily training institutions. What we will reveal in what follows is a very experimentalist and differentiated way of making use of the same institutions. We will see that these institutions are used in highly surprising ways, unanticipated by the political institutions that in the last instance govern them. But it shows how institutions and work organization can change simultaneously in a fairly integrated way to create a very different system than when it was originally formed.

In the 1990s this experimental use of institutions took place within the framework of an Active Labour Market Policy and many of the innovative schemes that we will report goes far beyond the scope and imagination that central politicians and bureaucrats held at the time. As we shall see, they were formed by corporatist collaboration at firm and regional levels and bear witness of a system in which the plasticity of institutions is great. Interestingly, it is also obvious that by having their members take part

in such arrangements, shop stewards and convenors helped create employees that could continually increase their respective bargaining power and delegate this to their representatives, which then became increasingly powerful stakeholder in firm-level partnerships. In this way the system of complementarities became quite forceful in creating and maintaining a virtuous circle of governance by negotiation, experimentalist search for novel forms of work-arrangements and fast upgrading of skills. In this way one could say that local levels experiments helped transform the Social- to an Enabling Welfare State in differentiated and highly unpredictable ways – as we shall see.

### **2.5.1. DSF stabilizing human resources by vocational training: the coming of the industrial operator.**

Training institutions in Denmark are being used in very differentiated ways and can be used by firms to process an entire sequence of changes in different aspects of company life. As briefly mentioned earlier, when waiting for being sold to a new owner for the second time, DSF first made use of the local AMU-center (the former School for Specialized Workers) in Svendborg as if it were a consultancy firm. DSF asked it to run courses for union-representatives and managers on how to co-manage the plant towards new forms of work-organization. This illustrates a very crucial characteristic of these institutions, as they make it possible for the union-representatives to initiate advice from the outside, which is thus not the autonomous decision of managers. These courses in turn helped not only create a partnership capable of collaborating on changing the plant, but also laid the ground for creating a *deliberative polyarchy* among managers, union-representatives and the vocational schools of the locality. In effect a plan was designed for using the school's standard and tailor-made courses to prepare workers for coming changes. The transition of the plant and the workforce thus could be co-designed into an integrated process that led to a successful outcome for the firm, not least because it offered an attractive reason for staying with the plant for the most capable and ambitious workers.

Habitualising training in this way, provided the foundation for engaging in a more long term training program in which 21 operators (about 25% of the total) became involved in a 1½-2 years part-time education for industrial operator<sup>27</sup>. Picking this education for promising employees constituted, at the time, the most advanced form of continuous training for formally unskilled workers.

In many ways the education for industrial operator (IO) – and even more so for the 4 years education for process operator (PO) – is a recent social innovation of significant magnitude negotiated and designed in corporatist bodies at the national level. It is announced in this way:

*“Industrial operators are responsible for the practical operation of manufacturing processes and monitors production by PCs and other forms of screens. ... Modern manufacturing is dominated by expensive equipment that cannot be manned by anybody. CNC-control, programmed processes, hydraulic, electromechanical and pneumatic parts ask for a broad fundamental knowledge about how they work and are attended. Machines and equipment are useful for making fast changes and so must be the operator.*

*An industrial operator often takes part in team-production, which calls for communication and reporting skills ... and the ability to take part in technical documentation ”.*

By studying the official announcement of the education for industrial operator it becomes obvious that the designers of the education have tried to create an education that prepare trainees to take on

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<sup>27</sup> 1½ years for workers with industrial experience and 2 years for new entrants coming directly from primary school.

responsibilities, which are usually associated with high performance organizations based on functional flexibility. It provides an education that prepares people for the situation of post-Fordist practices and team-work, and from firms where it may be devastating to recruit people with minimal skills as under Fordism. In short it provides the labor market with an entirely new type of “skilled” worker. In our view these educations are exemplary for the way that the social partners continually re-engineer the overall skill level at the national level, when practises in the system have changed over time in an incremental process.

At the turn of the millennium many firms realized how they could benefit from a skill upgrading of their workforce to IO or PO and took joint action to create enough size so that these educations could be organized in their respective regions’ vocational training centres. In one region – North-Western Zealand – we have seen the coming together of HR managers from a number of major Danish firms (Novo, Novozymes, Lundbeck, NKT, etc.), vocational training institutions, adult educational institutions and associations, employee representatives, national union officials and university researchers to make a concerted jump by upgrading the entire local labor market through these educations. Collaborative institutions at the level of firms (works councils; employees representatives in boards, ad hoc committees, etc.); corporatist boards of training institutions (where many representatives were elected from the mentioned firms – both on the employers’ and employees’ side) were complemented with resources from the European Commission to form an experimental partnership among firms and institutions, rendering it possible gradually to redefine roles and division of labor as aims were reached and troubles discovered. When we came into contact with this network, many workers had progressed through the education as industrial operator (IO) and an emerging problem was that they were starting to look for more challenges elsewhere. Therefore the firms wanted to create, on a local basis, a new curriculum on top of the IO to keep people in the region. Some of the firms, e.g. NKT-Cables, even engaged in new experiments seeking more deliberative ways of engaging employees in innovative processes by having them collaborate directly with university-researchers.

Another example of novel use of the IO education is that it becomes an issue in integrative bargaining on a large scale, when convenors and managers negotiate over future globalization strategies. For instance, recently convenors and shop stewards in negotiations over NovoNordic’s future globalization strategy accepted a no-growth in employment in Denmark in exchange for an agreement that gave all workers the right to an education as industrial- or process operator, while receiving their normal, full salary during its duration. Obviously it makes it much easier for Novo to continually redefine the role of Danish plants and employees in lieu of the gradual expansion globally, but it simultaneously gives their workers a considerably higher bargaining power and mobility on the general labor market. It is interesting to note that by doing so the firms both increases the potential of poaching and deals with it simultaneously, and it forces the firms interested in keeping the best of the workers to an offensive strategy of further training that is competitive in the eyes of their workforce compared with other firms of a region.

Despite their novelty, these educations are rooted in the way that the specialized workers’ union (SID, now 3F) have always tried to create “routes of passage” for their members to skilled jobs and to be able to contest the position of craft workers. Perhaps the IO and PO educations should also be seen as a highly codified route for “adult apprenticeships”, which has for long been a possible route of passage for formally unskilled to enter and get the institutional support of the career options of formally skilled workers. In the late 1990s SID’s education officers saw this form of education as a major breakthrough

for their members. Not only because they finally peered themselves with many crafts, but because it created access to longer vocational educations within, for instance, electronics, diverse forms of technicians, plast-making and process operators (for industrial operators). But it was also a way of coping with the fact that during the 1990s skilled workers had made a very significant and visible jumps in qualifications and job-areas, while the formally unskilled, though also being very active in further training, were missing a tool for rendering their many courses during the 1990s visible and recognized by accumulating them into a comprehensive education. One of the important characteristics of the IO and PO educations is that each student can make a separate route within its frame as concessions can be made concerning all the courses and practices that they have gone through in the past. By complementing these courses by a personal curricula plan, formally skilled thus can achieve a certificate that is competitive with the apprenticeships of craft-workers.

### **2.5.2. APV turning a plant into a vocational training machine**

APV provides an illustrative example on how offensive the skilled workers had upskilled from the late 1980s. This complicated case has been described earlier (Kristensen and Zeitlin, 2005; Kristensen 1994; Kristensen and Petersen, 1994) and here we will exclusively focus on relations of skill evolution, strategy, and institutions. By the early 1980s, the plant, still owned by a Danish holding-company, had its position reduced to specialize on pumps, valves and fittings from being a full equipment supplier for the dairy sector. However, having one of the most skilled labor forces in the region, it opted for a strategy to produce a limited product range in plenty of variants and to customer specification. A production manager and the convenor stroke a very offensive partnership to develop the plant into a continuous flow organization by making extensive use of CNC-machines, which at that time were in the early introduction in Denmark. The professional challenges were very attractive for ambitious skilled workers, who would otherwise have had an easy time finding jobs in other, less technologically sophisticated engineering firms. The vocational training institutions offered hardly any courses in CNC and programming at that time. However, the skilled workers were so keen to secure that programming and other skills associated with the new technology came to rest with them (and neither with the technical staff nor the unskilled) that they followed courses at machine-suppliers and were active in setting up local evening classes on e.g. root programming. During the first visit to the plant in 1985 it was remarkable what workers could do with “their” new machines. The firm had managed to create an impressive product portfolio, fast throughput times and an early form of team organization that proved successful both economically and in terms of customer satisfaction. However, the holding company had failed in the strategy to capture the American market and had lost so much money that by 1986 it was looking for a MNC to take over the entire Danish holding company. In 1987 it was taken over by the British MNC APV.

As in DSF, the serious challenge was that the firm might risk losing the best workers, given that it would have to stop investing in the most advanced machinery and that lay offs would be in the air because of low sales. The solution was to send a large proportion of workers on courses in computer-based technologies, or whatever they wanted, as the state would pay for the courses and reimburse a large proportion of wages. Together they stroke one of the first Danish local training agreements, specifying the rights and obligations of workers to engage in at least two weeks of further training a year, fully paid. Having failed in setting up a promising curriculum at the local technical school, the convenor and the local union office of the metal-workers invested in a computer system that gave an updated overview of all courses for skilled workers in Denmark. This system provided the basic tool for the plant’s workers when planning curricula for further training. But with this instrument the metal

workers union was able to stimulate further training in the entire area as the percentage of course participants to their members increased from 15% to 30% between 1985 and 1988 (Kristensen and Petersen, 1994, p 81).

At APV this system spurred those already in command of the new technology engaged in rows of advanced courses that combined the use of the new machines with Cad-Cam tools, computer-based construction and design, etc. Later on they would attend series of courses that would qualify them, e.g. as process repairers, -diagnostics and -re-setters. The less trained would embark on courses that would give them the basic skills in CNC, computing and programming, etc. Within the first year the plant upgraded skills at an incredible pace and gained a wide functional flexibility. As Horsens engaged in a very offensive rivalry with the Germans over market shares on the internal market of APV and won, demand soon outstripped its current capacity both in term of machines and people. Despite investment and hiring stoppage they found a solution. The abundance of well trained workers allowed for a turn to three shifts instead of one, and mastering a computerized planning system, they could establish just-in-time relations to local and national suppliers that in part had undergone a similar metamorphosis as the local union office had used APVs training agreement as a template for other firms in the stainless industrial district. Through continuous changes in work organization, the Horsens plant reduced delivery time to one month or a third of their German superior and competitor<sup>28</sup>. Simultaneously, blue collar workers had achieved such skill levels that they not only served flexible production but also could take very active part in developing new generations of products, enabling the plant to document very low development costs compared to any other plant owned by the MNC. From the mid-1990s skilled workers were taking over many jobs that had previously been managed by white collar technicians, while they were handing over more routine forms of programming to the formally unskilled, who had improved their skills to the level of the skilled in 1985. New positions as team leaders, group leaders, etc., had evolved and many had embarked on careers beyond what the plant believed possible in the past. In the beginning of the 1990s the Horsens plant also succeeded in winning the position of “best practice plant” and Horsens became headquarters of the fluid handling SBU coordinating the 22 plants around the globe. Despite a very small managerial hierarchy it could cope simply by sending workers as consultants to engineer changes in the work organization of other plants. In this way it transformed organically these plants to high performance organizations. Now, in many ways workers learned more doing their job than following training courses, but they continued to do the latter, too, not least to protect their skill-level at the larger local labour market. As the convenor saw anticipated a high-risk future for the plant within the MNC, his strategy simply was to help workers gain as much education as possible as long as they were hired by the plant.

### **2.5.3. Sauer-Danfoss: Destabilizing institutions in times of internal volatility**

In the light of the previous cases it is even more remarkable that SD seems recently to be destroying complementarities with contextual institutions by restricting its employees' access to further training.

Being originally a part of Danfoss, SD used to work in the shadow of the larger company. Danfoss could be said to have been an island of Taylorism in a country dominated by craft culture up to the early 1990s. In Danfoss craft workers had colonized machine-setting, repair and maintenance each of which used to have its own department, while the factory floor was occupied by un- and semiskilled specialized male (belonging to SID) or female workers (belonging to KAD). Many workers would be

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<sup>28</sup> Later they reduced delivery time for customized pumps to only 11 days

laid off in the fall, as production of heat-regulators was concentrated to spring and summer. Selected semi-skilled workers would be sent to training courses in the fall, gradually upgrading skills to become included in the core group of workers. After a new management team had taken over from the founding father in the 1980s, expressed disrespect for unskilled workers in the firms' future strategy led to strikes and conflicts that had never been experienced before. Managers had signaled that in the future skilled workers were needed for new computer-based, more flexible technologies, and a greater variety of more customized products. Mass production would be reallocated to low wage countries. Unions and employer went into negotiations and the solution was the design of a program for and agreements about extensive training of the existing workforce. Danfoss used its dominant influence in the region to create advanced training programs in collaboration with technical schools, AMU centers, etc. In the plants, maintenance workers moved into the factories, unskilled became skilled and setting and programming were taken over in some sections. However, heterogeneity characterized different sections of the huge factory.

It was within this changing tradition that SD gradually developed its own distinctiveness. Part of its development was that it would gradually create islands of teamwork, e.g. to solve quality problems or to create teams that could be compared directly over performance with external suppliers. This gradual creation of autonomous and economically responsible teams created a new and pressing need for new skills among specialized workers. When this emergent system became systematized in the so-called TPM concept around 2000 it implied an explosion in the demand and need for training in maintenance, continuous improvement methods, quality control, team formation, etc. On the whole the regional training institutions were able to respond to these needs having prepared themselves for such a quantum jump during the 1990s.

One of the critical new jobs was the team-leader/spokesman of the teams, being responsible for external contacts and for setting the stage for internal and external negotiations on job planning. To help normal workers transform into teamleaders a new education was created in a very new way. In the education co-designed by SD and schools, the team leader would formulate a problem that reflected his/her experience in the new job and then be supervised by HR-people from the plant, while being taught available knowledge by teachers from the AMU-center or other parts of the vocational training system. Combining the two spheres meant that teamleaders themselves were "co-designed" by bringing into the relationship the best available general knowledge from the schools together with accumulated practices and experience of the firm, in such a way that each new team leader would come to embody continually improved knowledge from the two spheres. On the other hand, by working with projects, the students would be solving problems, the solution of which was of interest to the larger group of team leaders and HR managers. Organizing education in this way in other words became a way for the work organization, continually to reflect on its practises. From what we know this system improved gradually and was very successful until it allowed Nordborg to expand very extensively on the American market.

However, the resulting explosive demand for new workers, huge investments in new capacity, the confused introduction of American versions of lean –production, and the constant struggle against deadlines not only undermined the TPM concept, it also made it impossible to follow a stringent training policy. Training evaporated and became again something, which different sections initiated when they would suddenly face dropping demands – primarily during the fall. One reason for this situation, compared to DSF, was that SD did not in a systematic way let their semiskilled workers

follow the curriculum for industrial operators. The convenor held the view that in the region this education had been by and large used to socialize and educate troublesome youngsters to the effect that it demoralized the older SD workers that had attended. But in case SD had frozen training, the American managers would have faced major troubles dismantling the model.

As managers from the US subordinated such areas as Human Resources, Quality, Marketing and Communication, it simply became very difficult for the convenor to strike an agreement, and, as in DSF and APV, stabilize the labor force in a time of major threats. As the American vice-president was convinced that many a production area would be outsourced, there was no reason to invest in training. Money would be wasted. Notice how different this policy is from NovoNordic, which in a similar situation decided to handle it by massive investments in training.

However, despite the American view, the upgrading of skills did not stop. During seasonal fluctuations, when the demand for some products decrease, several workers are sent for courses. The courses to be attended are negotiated between the employee, her supervisor, shop steward and the HR-department. Focus is on technical courses, expected to support a more flexible workforce able to understand the lean production model and its concepts. Courses are focused to fit the needs of the company, and they are not responding to the high skill-levels of old and some new employees. Workers do not see choice of courses, in effect, as a response to their aspirations. The courses currently offered, upgrade skills to a minimal level but do not improve employability at the external labor market. Thus the training “policy” rather than compensating for uncertainty, seems to signal to ambitious workers that the future lean model limits the challenges for the workforce.

Simultaneously, it is also seen as a destruction of the boundary-less careers that some employees had started to see in SD. For instance, a team leader had started as a skilled worker, worked for some time as shop steward, finalized a business bachelor, worked as a director at the local municipal administration, and returned to SD to form successful teams. Another example is unskilled women that had stopped working full time for temporarily dedicating more time to their families. When returning to full time jobs in a highly flexible workshop after children became teenagers, they were very eager to learn new skills and had time to pursue them. A final example is a human resource manager, who started as unskilled worker, made intensive use of his union education while being a shop steward and combined this with courses offered at the local AMU center to transcend from blue to white collar worker. From such persons the new SD way of organizing the last years have been disappointing and some will probably leave, making the internal labor market only attractive for to those that cannot find better employment elsewhere.

But prospects for the potential leavers do not look bleak. Danfoss has taken initiative to turn the many SMEs of the region into an engineering cluster that can help make Danfoss an attractive owner for foreign firms that are looking for being associated to an engineering multinational. As this gradually becomes realized, workers with the type of careers that we have indicated will have great chances to find employment in the region. Where this will leave SD, however, is another story – to be written in the future. The paradox for SD will probably be that they will have easy access to man the jobs that they are planning to outsource, while recruiting for the jobs they want to keep will be hard. It is indeed interesting to observe how difficult it is for American expatriates to make use of the Danish institutional system.

#### **2.5.4. MicroMatic: Solving internal problems by continuously rejuvenating the institutional matrix.**

When we turn to our next example, to the contrary, we shall observe a through master in the art of making innovative use of institutional contexts. MicroMatic(MM) offers a chance to study a series of transformations in the use of welfare institutions.

MM produces and sells a whole range of products that make up draft beer dispensing systems in many types and variants. Demand for particular products and systems varies from week to week, and gross-demand shifts radically among seasons. In the 1990s the factory was reorganized towards a line organization, each functioning as a large team, with job rotation and allocation of manpower, dependent on shifting demand. This reorganization together with various training programs (CNC-operation, quality control, etc.) effected a radical up-skilling of a workforce of primarily specialized workers.

Benefiting from the Danish flexicurity system MM, as numerous other firms in the region, used to have easy access to numerical flexibility by firing quite a large proportion of its workers in the fall and re-hiring them in the spring. With high unemployment rates, it was possible for MM to hire enough of its former workers to make possible the new work organization. However, as demand for skills increased with the novel work organization, and as unemployment fell after 1995, it became obvious that combining up-skilling of workers with seasonally adjustments would become difficult.

However, the job placement center (ArbejdsFormidlingen (AF)) offered a solution. Working within the framework of the Active Labor market policy of the 1990s, the AF had access to resources for activation and training, but needed firms, where unemployed could be offered practical jobs and job-training for a number of months as a socialization back to employment. Thus what was a problem for MM was seen a great opportunity for AF. In principle, AF could place workers at MM in high seasons, have MM clear the space for them in low seasons and offer new openings at the next high season.

Together MM and AF agreed to set up a job-bank. The idea was that people would apply for a job with MM by signing up in the job-bank at AF, which would then make in dept investigation of skills, motivation and readiness of each applicant. From MM they would get descriptions of vacancies – both permanent and seasonal. With the changes in work organization within MM, there were obvious and increasing discrepancies between what qualifications unemployed possessed and what qualifications MM requested. To solve this problem MM, AF and the AMU-center created a collaborative network, jointly designing an education lasting 14 weeks during which the unemployed under activation would first follow a number of courses in new technology, use of computers, principles of modern work organization, team-formation and collaboration, etc., and then be guaranteed some weeks of practice at MM. To ensure that the chosen unemployed were motivated for actually filling the jobs available, MM, AF and AMU would frequently interview the participants about their readiness for actually filling a vacancy in case it would become available, their attitudes to modern forms of factory work, etc. Sometimes these interviews would also detect that some students would need extra courses in order to learn better to read, write and do calculus. In other words, unemployed would be as carefully screened concerning skills as would normal employees and become prepared for working in high performance organizations.

This system worked from 1997 until 2003. Unintended the co-designers had invented an institution that enabled the labor market to transform unemployed into post-Fordist workers on a large scale. For unemployed that went through this sequence of activities, especially if a seasonal job at MM was included, bargaining power on the job market increased dramatically as many firms were being transformed along the same principles as MM. At the same time these activated workers created a challenge to the more permanent workers at MM, and some of the knowledge the unemployed had achieved became their aspiration. And this created a vision for a much more offensive and systematic training program and –agreement for the core MM-workers.

To the convenor and the shop stewards this form of institution building provided visions for a number of new initiatives. Internally, they wanted to educate a number of “pilots”, which were so multi-skilled that they could be used in every sphere of MMs factory. The idea was to let these explore every job inside the plant in order to detect what kind of training, they would need to always be well-prepared and then use this to explore which courses and training needs should be followed by different teams of workers on a larger scale. Simultaneously, the job-bank had been implemented in a number of other firms in the region, so that a group of firms, all having seasonal fluctuations in employment and experimenting with new forms of work organization, was tied together in a small labor market reform movement. First, they would start communicate early warnings about layoffs or hiring-campaigns mutually so that they could float a common pool of workers, exchanging practical and taught skills among each other. Second, some suggested a new system of “pilots”, chosen among the best workers from all involved plants, should be collectively available, for instance through a temporary employment agency. By circulating such workers it would be possible to explore emergent needs for training on a broad, regional scale and to circulate work-practise knowledge among many firms. In many ways such a system would create some of the advantages that is connected to the use of contract work in Silicon Valley (Barley and Kunda, 2004). However, this idea fell from resistance of both unions and employers’ associations as they were unable to see how such workers could be properly be integrated into Danish labour market agreements and how to make sure that firms did not use this to organize systematic poaching.

By 2003 the entire system evaporated. With declining unemployment, few job-applicants would accept 14 weeks of preparation before getting a job. Second, MM decided to outsource large parts of the more standardized parts of its production, which would reduce its labor force with one third, and after which Chinese sub-contractors would carry much of the seasonal fluctuations. Furthermore, remaining workers would be so multi-skilled that they could easily regroup according to changing demands.

But MM had learned a very useful lesson: It could be highly inventive to work with institutions to create support for internal change processes. For that reason they from the outset collaborated with the AMU center when having decided to implement lean principles in the remaining Danish production. Instead of introducing lean principles in a top-down process, all workers would in turn attend courses in “lean principles”. The courses would wind up in sessions on how to adopt the principles in the work areas of participants. Consequently, the courses became a search-machine for identifying possible improvements, which were suggested in immense numbers by the participating workers. Following these swarms of suggestions, MM’s work organization was changed dramatically. Instead of belonging to a team that comprised the whole line, the team was now a much smaller subsection, more like a U-cell, where workers could easier rotate. Within a quite short period, productivity improved by

18 % and in 2006 MM was considering to reintegrate some of the jobs that had been outsourced in 2003-4.

An unexpected outcome from the more narrow teams was less variable work. This was anticipated to be the cause for an increasing number of workers being worn-down, physically. However, from earlier lessons, MM created an institutional innovation to get out of troubles. When problems were detected with an employee, the shop steward, a HR manager and the potential “client” would gather to search for possible solutions. If no replacement job within the firm proved possible, the firm would call for a meeting with municipal social workers and a vocational guidance counselor. Together the firm, the “client” and these advisors would plan for a sequence of acts that would effect a change and rehabilitation of the client and bring him or her in a position where the emerging occupational disease would cause much less harm. In this way former factory workers have transformed by attending educational institutions to e.g. social advisers, schoolteachers, clergymen, etc..

Such movements across sectors and in careers-trajectories may be highly effective in creating institutional innovations on itself. For onstance, the officer at the AF, who had initially been a co-designer of the job-bank, had a typical boundary-crossing career that made him eligible for institutional entrepreneurship. He was first working together with his father in a small family owned engineering firm. Then he moved to Copenhagen and became, after substantial additional vocational education, “Meister” at a large electricity plant. When his Copenhagen wife finished her education as a physician, he followed her to Funen and her new job, where he became unemployed. Under the active labor market policy he became activated and took a series of courses and practices that made him an “activation adviser” and it was in this new position that he played an active part in co-designing the job-bank with MM. Obviously, such a career makes it possible to think of a situation from many positions (firms, the unemployed, the activation agency, etc) and to create a co-designing team across sectorial boundaries.

### **2.5.5 The new art of retaining employees in the new work organizations: Fritz Hansen**

MM was not the only firm in which we found a *deliberative polyarchy* (Dorf and Sabel, 1998) created around employees or unemployed in trouble. Fritz Hansen (FH), one of Denmark’s most famous furniture makers, has experienced a process of factory reform and outsourcing, very similar to MM. One of the consequences is that each employee has become a very critical and necessary resource that is not easily replaceable. At the same time, employees are often working under extreme pressure and tight deadlines, which make them very vulnerable to disorganization in some life-aspects.

FH has built an early warning systems that can detect if people are severely stressed, are developing an addiction or become partly physically or psychologically disabled, etc. Instead of waiting until people are in so bad a shape that they qualify as clients in the social or healthcare system, a procedure has been created. A HR-manager, a shop steward, a spokesperson for and the person in question create a group, discuss a preliminary plan of action and which public authorities and services to involve. Then the relevant “partners” (social advisers, doctors, psychologists, family advisers, etc.) are called for to negotiate how the person can best be brought back to normal. The firm may offer reduced working obligations, a part-time salary, extraordinary assistance, etc., in exchange of getting services that the public sector would only provide, if disabilities had been more severe. The public authorities do not have to be strict rule-following as they are not dealing with a person that potentially try cheat but a whole set of stakeholders negotiating on his/her behalf. This deliberative polyarchy can create a

program of part-time work, additional part time social insurance, a sequence of health-treatment and recreation, additional social services (childcare, home service, advisory counseling, etc.). Each stakeholder can see his/her own obligation as part of a larger scheme and understand the project of rehabilitating the person in question.

It is obvious that such polyarchies may be constructed for many situations creating an entirely new type of demand for public services, but it seems also quite obvious that working in this preventive way will be much more cost-effective if the system can be governed to avoid abuse. In this respect, it is interesting that a private firm, Falck, has created a number of services enabling firms to take preventive actions against a number of incidents that may cause lower effectiveness of their employees. For instance, insurance against employee divorce has diffused quickly. Falck delivers counseling, psychological assistance and lawyer advice so that employees will return to normal proficiency as fast as possible. It is clear in these cases that personalized services become a complex product that involves many partners from both several service providers, private as well as public.

#### **2.5.6. Plant closings and re-employing skilled masters: The APV-Horsens end story**

As mentioned in 2.5.2, APV-Horsens (APV) turned itself into a machine for upgrading skills among its workforce. Doing so allowed for continuous improvements in production, changing work-organization numerous times according to shifting fashions of shifting headquarters, innovating successive new product-generations and improving on external and internal logistics, reaching a delivery time of just 11 days. In 2005 the HQs decided that Horsens should outsource to China some parts, and move necessary machinery to a plant in Kolding also owned by the MNC. Workers under the leadership of the highly experienced convenor made calculations that showed that APV probably would save less than half the wage of a skilled worker if everything went well and the Chinese did not disturb delivery patterns, quality, etc. The convenor also promised that he and the workers would jointly work out ways to save this amount of money within a short period. This time negotiations went against Horsens, though the European Work Councils supported it. Deutsche Bank, as an important lender, wanted to regain some of the capital put into APV at great risk. The Horsens plant was located in a housing area and the site could be sold for property development at the price of DKK 12 mill, whereas the machinery was believed to be housed in Kolding at nearly no costs.

The whole story of effects from such decisions is very complicated. The short version is this: All attempts to outsource to China failed both because of time schedules and quality levels. The Kolding plant was not prepared to receive the machinery from Horsens and was reconstructed for millions of DKK.. The Horsens workers negotiated a very favorable deal that helped the firm make the move to Kolding, but at very high costs in terms of extra pay to the workers, earning over three months an extraordinary 6 months salary. Finally, Kolding failed to organize production with the same throughput time, and at the time of our investigation, delivery time had increased to 3 months instead of 11 days. Before Horsens had run with a large profit, Kolding was now incurring losses.

What happened to the workers from the Horsens plant? First, they were all offered a job in the plant in Kolding, but less than a third accepted and left after having assisted in moving equipment and machinery and starting production. Many shared the feeling expressed by a secretary that: *“We had been fighting for the continuous improvement of this plant and had made small miracles for decades, and yet the executive officers had deceived us. Who cares to work for people like that?”*. Second, almost all except those that just wanted an easy period before early retirement, got a new job fast, often

more challenging and demanding than their previous job. For instance, some of the most enthusiastic ones had been following series of courses that enabled them to diagnose and repair heterogeneous automated, CN-controlled manufacturing processes. Instead of being skilled operators for CNC-machines they now became responsible for large-scale processes in other firms in the region. One might say that their knowledge was not only retained but was made use of to a much higher degree in their new jobs, helping to make the region more competitive but through different firms. Another example was a CNC-machine worker, who was so highly trained in the newest generation of CNC-machining centers that he was recruited as a sales consultant by the CNC-machine maker to help machinists in customer firms with the initial setting, experimentation and programming of newly sold machines. A repetition of careers pursued by former colleagues (Kristensen and Petersen, 1994).

The former convenor from the Horsens plant had originally negotiated with a new experimental school to become an all-round handyman. But shop stewards from other plants urged him to become a consultant for shop stewards and convenors that were going through work reorganization and living under the ownership of foreign MNCs. He was hired by the local office of the metalworkers' union and could now make use of two decades of struggles, negotiations and strategizing in advising union colleagues. By hiring him, the local union office took a strong move towards rejuvenating the role of unions in a direction, which looks very promising (Kristensen and Robson, 2006). His wife, who had been a trilingual secretary, became a language teacher at a vocational school, a job she enjoys very much.

A team-leader and two of the best CNC-machinist bought some of the leftover CNC-machines from the Horsens plant at very low prices, created a small company and started to make parts for their old employer in Kolding, who had failed in engaging satisfactory suppliers from China. At the time of interviewing they were very busy and had no excess capacity, though they had already bought more sophisticated machinery to enable search for new customers. Moreover, because the MNC also had great troubles in running a new plant for supplies in Poland that had been constructed in response to the Chinese failure, they were engaging with the new firm in Horsens, which they wanted to train polish workers in Denmark and to run the new plant in Poland.

Finally, a second firm was in the making, as another team-leader had used some leftover materials from the former APV plant to construct a new product, which was under patenting. While waiting for the patent application to be processed, the former team-leader had created a consulting firm so he could accumulate a starting capital, simply by selling his consultancy services to the plant in Kolding.

Though all the people mentioned were some of the most radical union representatives in the APV-Horsens plant, they had an easy time transforming into capitalists. Together with the former convenor they had become members of the local chamber of commerce, and through this they became connected to a whole new setting of institutions, advisers and business networks that had public support to help them become new entrepreneurs. Simultaneously, they could use their skills in calculus, cultivated for wage- and other negotiations in the former plant, for new purposes. The former convenor was often called to negotiate prices and conditions for these firms towards customers.

All in all it was probably a great gain for workers and other employees that APV decided to close down the Horsens plant. On a visit just before the decision was made, it was obvious that the workers were tired of fighting continuously for the survival of the plant, making continuous improvements and

innovations without the owners ever remunerating or recognizing their high performance and the extreme profitability of the plant. However, it would soon be clear to all that the locality clearly recognized their skills. Hardly had the decision to close the plant been made before local firms contacted many of the workers with job offers. And had the convenor not negotiated a favorable transition salary for these workers, it might have been impossible to move the plant to Kolding. One of the last lessons, which the Horsens employees learned was that the recognition of the plant's high skill level served as a certification device for all employees. Therefore, firms and public institutions in the region were more than eager to recruit people from a firm of such reputation.

### **2.5.7. Beyond the normal reach of institutions: Unimerco inventing a new high skill route.**

One of the crucial though unintended effects of the dramatic changes that has been going on in Denmark may be that highly positioned firms becomes un-intendedly "skill-certifiers", so that its employees have strong position on the larger, external labour market. However, reputation and recognition of high skill level for a firm may also be a useful tool in recruiting highly skilled people. Though probably unintended from the outset, Unimerco (U) has created an organization that looks so favorable from both the in- and outside that it is easy to recruit people of high caliber, even during times of low unemployment. The roofed village, employee shareholdership, profit-sharing and an extraordinary canteen with delicious food can be seen as a masterpiece of organization, if you want people to stay in the midst of a high-mobility labor market.

Given these considerations of its comparative advantages, it was surprising to learn that Unimerco in its brochure on employee training policy simply stated:

*"Education and courses comparable to AMU-courses or short-term management-courses will never occur in UNIMERCO. We rather believe in more long-term forms of education, in which the student explores the subject in depth and in parallel makes use of the new knowledge in practice. Education and specialized courses will not be used as re-numeration or as 'depository' or 'capacity-adjustment' during periodic slumps."*

Thus Unimerco breaks with the pattern observed earlier, and rather emphasizes proficiency in languages, where nearly all language are relevant due to the ongoing globalization. In addition the firm suggests and supports education

- at universities, business schools and other tertiary educations,
- at business colleges and merkonom-, teknonom- and diplom-management-educations,
- at higher secondary educations (HF) within areas of language, math and IT;
- preparatory adult education,
- a variety of technical positions
- general adult education

The CEO, Kenneth Iversen, has pursued such forms of educations by being very entrepreneurial in creating the combined engineering and business high school in Herning (HIH) that has substantially increased the regional capacity for tertiary, middle-range academic educations. It is obvious that Unimerco tries to reach much further than do normal Danish manufacturing firms with this form of educational aspirations. The policy suggests that the individual employee have an educational project that develops in parallel with his or her job in the firm. Focus is not on short-term updating of knowledge, which the firm probably organizes internally, but on a long-term engagement that in the

end may transform the professional identity of the person in question. The individual is asked to consider two questions in searching for relevant personal education:

- What education would it take to get my current job in competition with an external applicant?  
And
- What education might I need in order to get my dream job at Unimerco in competition with an outsider?

These questions are discussed in recurrent employee interviews with his/her manager, yet it is left to the initiative of the employee to suggest new education and which must be arranged so that it is possible simultaneously to do the normal job. Unimerco often arranges specialized courses in their own facilities to cover specialty needs. But the facilities are also being used to run full diploma educations, where shifting university teachers comes to Unimerco to teach classes composed by students from both Unimerco and other firms of the region.

Unimerco's self-narrative is about a gradual transformation of itself and its manpower trying both to reach higher by taking on greater challenges and simultaneously educating people to increasing levels:

*“The last 25 years Unimerco has developed immensely. The keywords that describe the processes, we have gone through, are restructuring, development, globalization and growth. Within 25 years Unimerco has e.g. increased from 35 to 600 employees, from DKK 16 mill in yearly turnover to DKK 550 mill, from craft-educations as the highest level to employing basic employees with educations as engineers, bachelor- and masters degrees and from a Jutlandic Danish to German and English and in the future Spanish, Chinese and Russian languages.”*

Whereas technical-, commercial- and schools for adults and specialized workers have created strong ties and routines for working together with firms on upgrading skills (as we have seen), universities, business- and engineering schools in higher learning are much less in the habit of making such cooperation. Unimerco is probably among the first firms to actually push for a transformation of how such educational institutions interact with business firms. But a new pattern did not become clear to us. It is as if Unimerco is tired of waiting and makes new institutions internally, rather than externally, for instance by arranging new diplom courses in the university facilities on top of the factory.

#### **2.5.8. How to govern institutional experimentation: New needs for institutional reforms?**

Obviously, by entering the Danish Business System through only six cases, we have been able to reveal an astonishing variety and ability to experimentally create innovative deliberative polyarchies between the private and public sector. Firms and institutions have benefited highly from being able locally to experiment, governed by local corporate bodies at different levels. If abuse is being exercised it is within reasonable and acceptable ways of bending the rules. Institutional innovations are no doubt legitimate in the eyes of the local interest groups at such levels as school-boards, regional labour-market councils, etc. The largest problem is that a number of innovations, e.g. the new team-leader education in Sønderborg, the job-bank and the series of courses transforming unemployed to high performance workers in Funen, is not known outside these rather closed local circles. Asking e.g. for some kind of documentation of the job-bank experience, we could only get the collaborative agreements that were signed when initiating the deliberative polyarchy between the AF and a number of firms. No description of its function, nor an assessment of effects or of future possibilities had been

made. Only by in-depth case-studies of firms may such institutional innovations become detected and visible to a wider public.

There may be a way out of this problem. In a way the local union office in Horsens had early showed this by building a computerized overview over all available courses in the country to help the local metalworkers plan further training. They had to discard this system due to financial restrictions, however. Recently the national union office of electricians, which is among the most frequent users of continuous training, has created a computer system that makes it possible for the individual electricians to code into the system their own further training experience and then compare their personal profile with the average and best among their colleagues within different types of specialization. If such a system allows for the coding and assessment of all new local courses, it could become a media that rendered local innovations visible and diffused them to a much wider public. Especially if all unions or professional groups organize similar systems. However, it would be mis-information to enter into such a system just simply any ongoing experiment. Some kind of certification and quality assessment is called for to document, which kind of benchmarks may be achieved through certain courses or series of courses, and the big question is how such a certification of novel experiments can be organized?

Also from another point of view, there is a need for working with the experimental processes on a more systemic level. Unimerco almost illustrates the problem as the current system of unconnected courses may lead to complete disarray of the professional profile of an employee gaining totally unique combinations of skills and knowledge. Is it only if certain course combinations become clustered around a named certification as in the case of industrial operator or process operator that it will be possible to combine the short courses into more systematic educational efforts among firms and citizens? No doubt, a precondition for the high mobility on external labor markets in Denmark is the broad application of craft-educated workers with skills and vocational training comparable across the country. If a similar outcome shall be possible in further training, then a way to proceed might be to cluster together series of courses in a whole, huge set of novel educations that make it possible to recognize and contest the qualifications of certain new groupings of employees. Such an attempt might be very helpful because with the constant changes in work arrangements in firms, new types of positions are constantly created between the small managerial hierarchy and the incomprehensive jungle of teams. In no case, apart from Unimerco, have we seen a lasting organizational solution to the emerging new type of firm that is evolving. By creating a systematic route to certain, certified professional roles, the institutional system might create the building blocks for constructing new, more coherent forms of organizations in the private sector.

Another point is that while the intensity of continuous training was high and increasing throughout the 1990s it has been less intensive and decreasing after 2000. This is probably due to two factors. First, the new Liberal-Conservative government has reduced the institutional support for continuous training. Second, due to very high activity and employment over the last couple of years, firms have had less time to send employees to courses and to help them initiate long-term educations.

In this way the training system unintendedly has become a device that works as a new form of “automatic stabilizer” more oriented towards output than demand as was the case under Keynesianism. Ideally the further training system could be activated quite heavily during slumps and be reduced under booms so that the slumps were times of exploring and developing new knowledge and booms for exploiting this knowledge. The consequence would be that not only students moved in larger numbers

into the system under slumps, so would teachers, consultants and managers, whereas all groupings would move back into the private sector during booms to exploit new skills. For such a system to constantly improve across slumps and booms, it is mandatory that a monitoring system takes care of documenting and assessing practices so that they can be made useful later, given that the organizational memory of schools cannot be expected to rest with the teachers, etc. To the best of our knowledge, no government agency has of yet been assigned such a task. However, if this problem can be solved then teachers would probably gain a lot of knowledge by finding employment in private firms under booms as the changes and learning that goes on in private firms are very impressive and highly relevant for being able constantly to rejuvenate the curricula of vocational schools.

The institutional system surrounding the labor market seems highly plastic for those engaged in using the system offensively. However, it does not cover all groups. The system has difficulties in playing in concert with very small-sized enterprises that hardly can plan several weeks ahead concerning which workers to send for further training. Second, when interviewing the AF-consultant who had co-designed the job-bank in Fünen, he expressed great frustration with the new institution that had been restricted to unemployed under employment-insurance. People under social insurance were only allowed to participate if the municipality in which they lived was prepared to cover additional costs. Consequently, people under social insurance were systematically kept away from upgrading and modernizing their skills in accordance with developments in the labor market. This seems to call for some kind of novel state intervention. While the unions some years ago made it a universal right in the general agreement to have at least two weeks free for attending further training, they have in the 2007 general agreement created a fund that gradually will make it possible to finance such participation – in terms of salary and course fees. During the negotiations the unions were strongly in favor of reserving these funds for members of the LO-unions, and though they did not succeed in this claim, there is no doubt that they will try. By running a computer system for curricula planning as do the electricians' union, they might create a very efficient system that enlarges the division between the ex- and included. Some form of state intervention must secure that the excluded is not the most needy.

What we want to emphasize with the row of problematiques in this section is that a very dynamical process is going on at many lower levels of the “system”, but these experiments are not deliberately used to re-configure and systematize the system so that its future potential can be detected and designed. Piecemeal innovations occur constantly, but as these steps are taken without being recognized at higher political and corporatist levels, which primarily see in the system devices to fight current and future unemployment, it is very difficult to make institutional innovations that turn the system into a tool for offensive continuous innovation. The danger is that firms simply outgrow the system, as illustrated in the case of Unimerco, and then it is evident that partnerships at firm-level may be less able to create offensive strategies through the creation of polyarchies between the public and private sector. For that to be possible in the future collaborative polyarchies must be created at higher aggregate levels and this calls for institutional innovations that none seems to be engaged in engineering.

### **3. Synthesizing the distinct dynamic of the globalizing Danish Business System and comparing its strengths and weaknesses with other Nordic Business Systems**

#### **3.1. Synthesis of the Danish Dynamic**

At a first glance, it may be difficult to discover an overarching common dynamic between the firms we have described. It could be said that what unites the cases and the institutional adaptations that we have

just described is their diversity and variety both in strategizing and in organizing. However, this view does not point to what the cases rule out. As mentioned, in 2000 only 30.000 became unemployed because of lay-offs, while 260.000 shifted employer primarily to get a more challenging job in another firm. This high labour mobility has many repercussions on the entire firm structure.

First, it means that there will be a tendency for employees to de-select firms that do not offer chances for continuous learning. Whereas in many countries transnational outsourcing is a major mechanism for reducing more simple, Taylorized work, in Denmark it is as much the mobility of employees that reduces the jobs that are stable and simple routines. This could be one of the reasons why it has been discovered that overseas outsourcing only reduces existing jobs by 5% yearly and that the firms that do outsource at a general level create as many new jobs as the firm out.

Secondly, we observe a high tendency for firms to react to flexicurity more by trying to use the institutions to “tie” workers to their plants by offering opportunities for training, shifting challenges and participation in different forms of team- and projects. Risk of losing employees make firms up to their toes to find continuous better ways of tying workers to plants so that they do not suffer from extensive poaching.

But this dynamic is not all encompassing. Some firms enter for various reasons, temporarily (as in the case of Sauer-Danfoss) or more enduring, into a vicious circle where they lose the more offensive of their employees while recruiting to a larger extent workers that have much less ambitions for learning and challenges. When this happens, the loss is not only related to the quality of the immediate employees but also for making use of the institutions of the welfare state, in particular those connected with further training.

Despite the fact that Denmark has rescued itself from the tendency to create the strong dualism on the labour market that is associated with Anglo-Saxon countries, there is obviously also a tendency for firms and employees to drop away from the institutionalized mainstream. As Gjerding (1999) showed, 42% of all firms were neither internal nor externally flexible and within these there is a tendency for part of the unskilled workers, in particular, to stand outside the overall dynamic of learning at job and searching for further training programs (Undervisningsministeriet, 2005: 28 ff).

From our case-studies we think it is possible to characterize a mainstream dynamic for Danish firms. They enter into fairly tight engagement with customers and try to improve their capabilities to service their customers with increasingly more sophisticated products, services and consultancies, which they develop by gradually discovering how they can become useful. Thus Unimerco first sell tools, then start to repair and regrind tools, continue by developing specialized tools where the general market is found lacking and then finally starts to consult customer-firms on how to optimize management of tooling more generally. In a similar way Radiometer has used its instruments to become deeply involved with customers by adding accessories, services and consultancy. APV did it by customizing their pumps and valves and simultaneously reducing delivery-time so that their customers, primarily engineering staff, could specify pumps and valves just before a turnkey-food-processing plant were finalized for delivery.

The way in which Danish firms moves towards globalization probably differs. The complicated steps that lead Sauer-Danfoss to become a favoured supplier for John Deere and other OEMs on the

American market differs very much from how Unimerco simply follow their Danish customers in their steps to globalization. However, when the step has first been taken, the trajectory of sophisticating services is continued so that their role is redefined, dependent on what the customers on a larger scale are now asking from them. This mode of pursuing a strategy is, as far as we can assess very different from firms that pursue a strategy of endogenous R&D, where it is the scientific and technical advances that create options and open opportunities. In these Danish Firms the logic operates in an opposite way as it is discoveries of customer-possibilities that trigger technical search and experimentation. A good example of this is when Unimerco discovers that it can open up an entirely new market segment if they learn how to make and maintain cutting tools after the new Airbus-specifications, or can apply Nano-technologies to the surface of tools. In this case increasing technological capabilities is rather used to open up new relations of tight customer interaction and to increase services for those already serviced. In the case of Radiometer, close relations to certain points of acute care in hospitals open up for looking for new products for these environments beyond Radiometers existing product portfolio. This way of working makes it indeed difficult to create an R&D department that fits all purposes. Rather the R&D department, perhaps, becomes a device for being able to search and communicate in a proper technical way with both customers and suppliers and to organize - with whatever is available in-house resources - projects that serves to solve the problems that make it possible to exploit the seen possibilities.

It is a repeated pattern in our case-studies that employees in production belongs not only to a primary production-team. Across the firms employees are engaged in ad hoc project teams that serves to develop something new, often coordinated by the typically small R&D team. Thus the firms in a very spontaneous way make use of the increasing skills that is cultivated in production also in developing new products and services. Old demarcations become blurred, and often technical staff departments becomes located in production serving the process of continuous improvements and this process might easily move towards discrete innovations both in production processes and in services. The general impression from our case-studies is that this is most often, and in particular in Unimerco, organized in a very informal way, very much dependent on the situation. Danish firms therefore have had difficulties in implementing Lean-management principles and making the organization transparent. However, the often strong position of union-clubs, convenor and shop stewards and work-council arrangements have been used, best illustrated in the Radiometer-case, to prevent such organizations from evolving into departmental opportunism on a grand scale. The presence of a mutuality of “interests” from many parts of the organization in new, temporary teams and ad hoc committees make the organization transparent in very different ways than achieved by lean-practices. Communication becomes lateral, informal and yet it is a constant process of renegotiation of roles and rules that makes the involved collaborate in efficient ways.

This pattern of informal collaboration obviously makes “documentation” a seemingly unnecessary cost, but we think it has also repercussions to the larger pattern of interaction with external firms globally. Voigt (2007) studying the outsourcing of IT-jobs to India in a number of small Danish firms found that that the Danish firms originally expected to be the “architects” of software-systems and the Indian suppliers to become the “craft” programmers – fully in tune with the normal expectations of how Western firms optimize the global value chain. In most cases these expectations proved wrong and the Danes discovered that they would have to specify and document jobs to a much higher degree than they were used to. But instead of searching for how to do this, they engaged in a different route by inviting Indians to Denmark and work with them in the Danish facilities so that the Indians became accustomed

to the Danish way of interacting and collaborating. During this process the division of labor between “architects” and “craftsmen” dissolved and instead a more egalitarian way of discussing how customer-needs could be fulfilled in the most efficient way by their collective capabilities came into being. Thus instead of cultivating a closed collaborative relation to the Indians, this relation was used to experimentally make use of the skills in both communities and change the reach of both. For instance, a manufacturer of moulding-forms had used the Indian relation to increase its capacity both in terms of IT-programming and of craftsmen for making the forms. But the Indians succeeded in capturing new orders from the Indian based GM. The Indians dared to take this step by having the Danish firm as a backup, and by taking the step both firms increased their customer-range considerably. On the other hand the Danish firm started to service its normal customers on a broader scale taking on board also more simple, or labor cost intensive tasks that it had previously rejected, thereby creating much more new jobs for the Indians. As in the case where customer relations helps redefine the firm, we see that also supplier relations have this effect rather than stabilizing an optimal transnational value chain.

Thus we see a pattern repeated. Danish firms work closely together with customers in such a way that they continuously upgrade their services. They do the same with suppliers, so that they learn about new options (technologies, skills, and customers) that may gradually redefine the original relations in a quite encompassing way. And this dynamic of external relations is founded in a work organization in which employees can be combined and re-combined to solve highly shifting problems. Preparing the workforce for such work organization is done in a vocational training system that has always aspired for creating independent and responsible employees, which in case of new technologies, new forms of organization and shifts in labour demands are very offensive in searching for employment by which they can learn new skills. To manage such a labour force, firms engage in internal rivalry and collaboration, to a high degree monitored by the intervention of union representatives, in situational collaboration with vocational training, labour market- and social welfare institutions.

Obviously, the more this system becomes tied up to a multiplicity of customers globally, the more will it receive inputs and challenges that enable the firms to learn and to organize search. To the extent that firms are able to organize their home-organizations in Denmark in such a way that it is possible to react to this multiplicity of demands, it will be possible to cultivate this new version of the traditional pattern of Danish enterprises.

However, it is quite obvious that this at the bottom depends on how well the educational and vocational training system is able to respond to firm-level developments by supplying skills that co-evolves with the firms. Perhaps this task has been surmountable as long as the firms cultivated skills on top of existing apprenticeships, engineering specialties, etc. or renewed these by diffusing knowledge and mastery of new technologies or organizational forms. With the independent cultivation of products and services for each firm in each their idiosyncratic way, the system as such faces a major large-scale challenge. How to renew educations, vocational and further training in such a way that the system deliver on a broad scale employees that can be recruited and live up to the new demands? And how to offensively develop new skills that are relevant on a general scale so that employees are attractive on the larger labour market?

In its classical form, the Danish system had the Technological Institute and a number of branch-specific technological service-institutes, themselves engaged in research and development, upgrade curricula for both Technical Schools and AMU-centres. Today it is not very easy to identify independent

institutions that serve the same purpose. So the question is how the offensive – ahead of the demands as incrementally recognized by firms themselves – identification of new skills can be organized?

In interviews respondents have told how small groupings of employees across firms organizes quasi-professional groupings that share interests in technical issues and by meeting each other at still more advanced courses form a community, which is mutually capable of assessing and progressing skills. In such quasi-professional-communities it is much easier to assess specialized skills and knowledge than is the case of individual firms, where the employees with the best developed skills are often isolated and without any group of likeminded colleagues. Skills without a social space could become a major problem for the Danish system. Whether such places may be able to develop through the internet is an open question, but it is obvious that unions and professional associations in one way or another should frame virtual meeting places for such communities and could use these to point towards new and more advanced training/courses.

### **3.2. Comparative lessons from the other Nordic countries.**

Obviously, a number of Danish firms as Novo, Danfoss, Lego, Vestas, Bang & Olufsen, etc. are large enough to organize endogenous R&D departments of a considerable scale and by doing so setting a quite consistent, self-chosen agenda of learning and search within their organization. But compared with the large Swedish firms or Nokia in Finland, they are unable to ascribe this logic to and give a common orientation for the larger context of R&D institutions and the educational system. It has been very difficult for Danish firms and universities to develop increasingly intensive collaboration, and the Centres of Excellence (Brenner, 2003) that has been formed since the beginning of the 1990s seems not to have changed this pattern to a recognizable extent.

As far as we can assess from Gergils (2006) analysis of Innovation systems in the Nordic countries, Finland is the only country that have been making use of centralized corporate bodies to create systematically negotiated and coordinated Innovation Systems in which distinct firms becomes involved – as did Nokia – in a concerted action pattern that is even supported by the most important ministries. According to Gergil's account of Sweden, the large Swedish firms have not been able to mobilize the political system to such a pattern of combined action. According to recent case-studies of technologically advanced firms in the Norwegian oil- and gas- supply-industry by Eli Moen, the more general corporate system has been able to renegotiate reforms under which the interaction and collaboration between Statoil, its technical suppliers and their equipment suppliers have changed dramatically.

Such “layered” and partly complementary changes have not been discovered by us in the Danish case-studies. We would doubt this to be a more general trend in Norway, too. The oil-industry in Norway constitute an extraordinary concentrated system, where it is understandable that levels can interact in such ways. But outside this particular system, we would expect search and development to be as uncoordinated as it is in the Danish context.

When looking into the small subset of myriads of small incremental changes that we see going on, it is indeed very difficult to anticipate how the agents – firms, research-institutes, vocational schools, professions and unions of different groupings – could organize lasting unifying innovative programs out of any corporate body and sanctioned by the highest political levels. As firms are penetrating or

gets penetrated by out- and inbound globalization, their relations to other firms and research-institutions becomes increasingly “occasional” and situational. Andersen et al (2006) have found that globalizing firms make less and less use of the clusters out of which they have originated. We think that this might be a signal of a transformative period, where they less and less make use of each other for more stable businesses, but a new period may gradually emerge, where they use each other to help search for contacts globally, so that they can increase their global network as demand and problems changes. However, we do not think that this new search-network will emerge deliberately among managers in these firms and they may in responding to surveys, as in the cases studied by Andersen et al, even not know what networks the firm are tied into.

In the firms studied, among all employee groups, we have found very heterogenous careers that have brought the people through a myriad of different institutions and firms on their route to their current job. By taking this route they have created a myriad of contacts to many distinct persons in different firms and institutions and they may draw on these contacts if they in their current job faces a problem that they do not immediately know how to solve. Even among the group of so-called “unskilled” have we met people with a background as skilled workers, many with a high-school degree, engineer-drop-outs and graduates with humanistic university degrees that could not find a job in their original “trade”. Obviously, such persons have a highly varied repertoire of outside contacts and as they across their differences have expressed their satisfaction over working in a factory that has been turned into an experimental laboratory, it is obvious that a new system of multilayered networks is in the making in such firms. To identify new institutional devises that may re-enforce this evolution is an important research topic.

Obviously research-institutions could play the role of tying up and connecting firms mutually, when they discovered that a number of national firms were working within similar areas. But this would demand a feel for the game of the national Business Systems’ ongoing activities that is not easily detected. In these years, however, Denmark is suddenly discovering that through swarms of discrete and coordinated steps a myriad of firms possess jointly a capability to create energy systems based on heterogenous energy-sources and turn them into uniform output. On such a topic it might have a major effect to create unifying institutions, meeting places and communities of quasi-professionals. For that purpose, we think the Finnish system has more to offer than do the Danish or any of the other Nordic countries. But if a meeting place for e.g. engineers is created, while all other groupings are denied access, it might reduce the overall communication within the system instead of increasing it. Thus to create national systems that on a systemic level enlarges the capabilities of each firm to specialize its distinctive relations to the global is indeed a difficult target.

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