"VOLVOISM" AT THE END OF THE ROAD?

DOES THE CLOSING-DOWN OF VOLVO’S UDDEVALLA PLANT MEAN THE END OF A HUMAN-CENTERED ALTERNATIVE TO A "TOYOTISM"?

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REFERENCES AND ACKNOWLEDGEMENTS
November 4 1992 Volvo announced the closing-down of its innovative plants in Kalmar and Uddevalla. These plants have become world-wide symbols of the possibility of combining high productivity and rewarding jobs. Does the closure of Kalmar and Uddevalla mean the end of a European, sociotechnical alternative within the industry? Does "Toyotism" mean the end of history in industrial organization?

No. The performance of the Uddevalla plant was according to Volvo management equal to that of its conventional Torslanda plant in Gothenburg when the closing-down was announced. All three assembly plants in Sweden were approaching European performance levels. Uddevalla's potential for further improvement in quality and assembly time seemed great, even more so in the area of marketing and customerorientation of production. The Uddevalla production model is thus a viable alternative, besides the Toyota production system, "toyotism" or "lean production" as its ideal type is called in the US bestseller The machine that changed the world. Today's situation is contradictory and open, and the features of post-Fordism are still not fully developed.

For this reason the closure of Uddevalla has a strategic negative impact. It is thus important that it becomes well established that Uddevalla's performance was at least equal to that of Gothenburg and that Volvo did not even demonstrate there were short-term economic gains, let alone long term gains, in closing Uddevalla and Kalmar, rather than making other reductions in capacity. Our task here is to try and understand why Volvo all the same decided to close the two innovative factories. We first give a quick description of the production model of the Uddevalla plant and of its performance. Then we discuss Volvo's official justification of the close-down decision: overcapacity and a cost calculation showing savings. We focus on the Uddevalla plant because it is the most recent and advanced in terms of design principles and because it was the first one to be closed.

1. THE UDDEVALLA PLANT

In 1974 Volvo's Managing Director, Pehr G. Gyllenhammar opened, with due pride, the then pioneering car factory in Kalmar and fifteen years later, the plant in Uddevalla. To an even greater extent than Kalmar, Uddevalla broke away from the once-dominant Taylorist mode of work-organization that divides the work and controls the workers in detail through machines and supervisors. The assembly-line was gone and in its place are: qualified, autonomous groupwork for assembly; advanced automation in the handling of the production-material; co-determination in the planning and a minimum of levels in the organization.

Some more details should be given about the Uddevalla plant. It has a centrally located materials shop, six product shops and two inspection shops. The materials are kitted for individual cars and transported by means of a camer system to the teams. The kits make up a comprehensible part of the car. Each product shop has eight teams with about nine workers. Each team assembles, independently of other teams, complete cars without moving the car more than once. The division of labour in the groups is usually such that each worker builds a quarter

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22 Earlier, shorter versions of this article were published in New Technology, Work and Employment, Vol 8, No 2, Sept. 1993, and in German in Frankfurter Rundschau (April 29, 1993) and the journal Arbeit (Dortmund), Vol 2, No 2.


of a car. There are no supervisors. Instead, there is a rotating job as a "lagombud" (group "ombudsman") who relates to other groups and to the product shop manager.\textsuperscript{25}

Advanced pedagogical principles and materials handling interact to create something uniquely new. The learning in this work organization is impressive. Being engaged in all aspects of work makes the production comprehensible and the employees become, as a part of their job, involved in the customers' demands and in striving after constant improvement. Work-intensity is high, as in all group work.

\section*{2. ACCESS CAPACITY IN VOLVO}

Like other car-producers Volvo suffers from excess capacity. Sales of "large cars" diminished by more than 30\% between 1989 and 1992. In this context it is easy to assume that the new Volvo management was simply choosing to shut the least productive plants. This assumption however is unwarranted. According to the management of Volvo Cars Kalmar and Uddevalla are on a par with the conventional Torslanda factory in Gothenburg in assembly-time and quality performance. The assessment and the goal is that all three Swedish plants would have reached the European level of the Belgian Gent plant by 1993 and be among the world leaders by 1997.

Then why did Volvo choose to close Kalmar and Uddevalla, and keep the assembly line in Gothenburg? This question remains also after the closing of Uddevalla - the last car left the plant Monday April 19, 1993. Volvo never seriously answered questions from researchers in leading Swedish dailies, but reiterated the figures in their original press information, already shown to be incorrect and the likewise refuted argument that the whole decision was a simple question of a necessary reduction of capacity and costs and not a strategic decision concerning Volvo's trajectory of advanced production organization.\textsuperscript{26}


\textsuperscript{26}The following researchers took part in the debate in Dagens Nyheter: Ake Sandberg (Feb 4 1993), Peter Cressey (March 8), Karel Williams and Colin Haslam (March 27) and in an open letter to the different actors Elsie Charron, Kajsa Ellegard, Michel Freyssenet, Bob Hancke, Ulrich Jurgens, Rianne Mahon, Ake Sandberg, Jesper Steen, Peter Ullmark and Karel Williams (April 6). Answers came from Volvo s former CEO, now board chairman Pehr G Gyllenhammar (April 1) and from Volvo cars director Lennart Jeansson (April 13). Ake Sandberg continued the debate in Goteborgs-Posten (GP) and Aftonbladet (both April 16) and Lennart Jeansson answered (April 17 and 19 resp.) with the article already published in Dagens Nyheter. The same day in GP Volvo group level unions chairmen Olle Ludvigsson and Andrej Krugli answered. The debate went on in GP with contributions (April 21, the day of the Volvo shareholders meeting) by the chairmen of the unions in Uddevalla Lennart Eriksson, Gote Klingvall and Janos Molnar and by researchers Kajsa Ellegard, Thomas Engstrom and Lennart Nilsson, and Ake Sandberg. The answer from the Uddevalla unions also appeared in Dagens Nyheter the same day. Further articles came in GP by Gosta Arvastsson (April 20), Olle Hammarstrom from SIF (The union of technical and clerical employees in industry) (May 16) and Ake Sandberg (May 17). In Arboret P O Bergstrom of the Swedish Metal Workers Union answered April 22. Besides this debate the Uddevalla plant was the subject of many articles especially by Gunilla Mosen in the regional newspaper Bohuslanningen.
3. THE UDDEVALLA PLANT PERFORMANCE

A closer look at the performance of the Uddevalla plant will make the need even greater to find explanations to the closing-downs.

In Torslanda the assembly-time in October 1992 was 42 hours per car. In Uddevalla the lowest figure was 32.8 work-hours, to which 6 hours of white-collar work should be added. Productivity measures like these are difficult to compare, but indicate that Uddevalla had reached the level of Torslanda. There is still a bit to go before they reach the Japanese level, but one indication of the potential of Uddevalla is the fact that several workers assembled whole cars in less than 20 hours, one of the workers there managed to build a whole car in just 10 hours, plus a few hours for materials handling etc.\textsuperscript{27} The Uddevalla plant overtook the Gothenburg plant’s assembly time after only three years of operation. The same is true for other indicators of performance. Here I will give a short overview; some of these and other aspects will be taken up below when discussing Volvo's cost calculations.\textsuperscript{28}

The quality of products from Uddevalla was higher than that of Gothenburg both measured as number of defects per car (6 versus 7 respectively) and according to J D Powers customer survey. Kalmar's quality however was the best among the three Swedish plants.

In the autumn 1992 Uddevalla's total lead time for delivery, from the individual customer order, was down to four weeks, and a further reduction down to two weeks was planned during the first half year of 1993. One explanation for this flexibility is Uddevalla's highly parallellized production system which gives no balancing problems and no need for a fixed product mix. Customized production and short lead times combined means higher sales prices and virtually no cost for finished car stock.

To the astonishment of many observers Uddevalla needed less investments in tools and equipment than the Gothenburg plant; due to long job cycles the number of jigs needed is reduced as one operator finishes a whole task rather than the task being divided among several workers each one needing one jig.

Also model changes in Uddevalla needed less time and less costs in tools and training than the Gothenburg plant. The explanation is low-tech solutions and the workers' high competence level which facilitates learning of new tasks.

4. VOLVO'S COST CALCULATIONS

Volvo justifies its decision to close down Kalmar and Uddevalla by referring to an estimated saving and strengthening of its cash-flow by 350 million Swedish Kronor (MSEK) per year (approx. 50 million US dollars) by concentrating the assembly to Torslanda. Volvo points out the following: 1. The cost of transporting the bodies from Gothenburg to Kalmar and Uddevalla as the latter do not manufacture or paint bodies themselves, and then of transporting finished cars back to Gothenburg. 2. Management and administration costs. 3. Facility and other plant costs, for one as compared to three plants.

\textsuperscript{27} “En besviken elitarbeteare”, Metallarbetaren, January 1993
\textsuperscript{28} This section is based on interviews with Volvo managers and on articles by Gunilla Mosen in Bohuslanningen; see also a manuscript by Christian Berggren “Volvo Uddevalla - a dead horse or a car dealers dream”, 1993, for a more detailed discussion of performance comparisons.
Out of the 350 MSEK approximately 100 MSEK is a pure book-keeping transaction. The investment in Uddevalla is depreciated at once and this does not, as we shall see, correspond to real savings. The rest, 250 MSEK, is what Volvo sees as savings in costs for operating the two new plants. Each of the three items above can be criticized and shown to be incorrect: 1. The cost for the transportation of finished cars back to Gothenburg should not be included. The pre-delivery inspection (PDI) which has been concentrated to Gothenburg can easily be decentralized and Uddevalla can deliver directly to the market. There are indications that the total cost of the in-transport of parts per car is bigger in Gothenburg: limiting the calculation to bodies gives a distorted picture. 2. Volvo assumes that 30 MSEK savings in white collar labour in Uddevalla and Kalmar will not be compensated for by new employees in Gothenburg although production volume is planned to raise there; but if that is the case such savings might have been implemented independently of the close-downs in Uddevalla and Kalmar. Furthermore, in Gothenburg staff and bureaucracy have been built up for decades while Uddevalla, after reorganization, had a small administration. 3. A possible future 15 MSEK investment in Uddevalla in 1998 in equipment for production of a new model is anticipated as a cost 1992 and the closing-down is regarded as a saving of the same amount. This is another example of book-keeping operations to Uddevalla's disadvantage. The Uddevalla plant could have operated another five years without really incurring such a cost. Furthermore the real costs of the facilities are reduced only if one can sell or lease the plants: the plants in the peripheral regions of Kalmar and Uddevalla can prove to be difficult to sell.

Altogether it can be said that the calculations seem to substantially overestimate the cost-savings of a concentration in Torslanda. The cost calculations are misleading in a systematic way to Uddevalla's disadvantage. The above examples are meant to illustrate this bias. Participants from the Uddevalla plant in Volvo's study of capacity problems found that closing Uddevalla may - given the preconditions for calculations set by Volvo result in possible cost reductions of around 50 MSEK. This is a small sum, not sufficient to explain the plant closure. Furthermore the preconditions given are questionable and were criticized by the Uddevalla unions. Considering these additional aspects the Uddevalla closure probably has negative economic effects for the Volvo group. First the closing down of Uddevalla is not compared to other possible reductions of capacity. Second the calculations do not include the revenue side. Both facts are to Uddevalla's disadvantage and will be discussed below.

5. ALTERNATIVE CAPACITY REDUCTIONS

Let us first look at the fact that the cost comparison is made only with an unchanged present situation and not with possible alternatives. This is an elementary methodological mistake when making cost calculations. Even if Volvo's management does not present them, it is not difficult to see alternatives that not only would include cost-cuts but also possibilities for an increase in revenues and strategic strength.

A first basic possibility would be to look at the long-term demand and not make decisions about irreversible closures based on the present weak trade outlook and non-existent industrial policy. If capacity reductions needed to be done, a short term solution, argued by the Uddevalla trade unions, was running the Gothenburg plant at day shift only, closing its evening shift.

If factories were really to be closed down, the obvious alternative would have been to direct the changes to the more conventional assembly plants in Belgian Gent or in Torslanda. It can be difficult to compare the Swedish plants to the one in Gent with its proximity to the European
market, but a closure of that plant should possibly be considered by a company that is motivated by its need for concentration. This was done in the trade union group with representatives for the Gothenburg, Kalmar and Uddevalla plants for analysis of capacity and economic problems. The conclusion was that considerations of the European market and substantial investments made in Gent in the late 1980’s in new body and paint plants made a closing down there difficult.

Secondly, a cut-back in the assembly-work in Gothenburg could have been implemented. One possibility was to rebuild one of the assembly lines there and, if the trade outlook did not change, close down the other or both. With shiftwork the capacity of Uddevalla and Kalmar would have been enough to assemble the number of cars the management has planned to produce in Sweden in the near future; if more capacity should be needed one of the lines in Gothenburg could be modernized and kept. A concentration in Uddevalla and Kalmar would have implied at least as big a saving as the Torslanda alternative:

- the cost of the transport of frames would be higher, other transport costs lower, at least in the case of Uddevalla.
- the administrative superstructure would probably be smaller through decentralization and orientation towards production and customers in the two new plants
- the prospects of selling the site and the plant at Torslanda are better as it is centrally located.

Even just a short-term analysis of the cost figures seems to favour a concentration in Kalmar and Uddevalla. The outcome would be even clearer with a long-term analysis. Torslanda will have to count on future investments in order to improve factory buildings, control systems, as well as the organization and the competence of the work-force.

6. THE REVENUE AND MARKET SIDE

Let us now look at the revenue side, which was completely excluded from Volvo's calculations. It speaks clearly to the advantage of the alternatives, which, compared to conventional production models are a dream for the participants in the markets of the future, for the car-builders (assembly workers) as well as for the customers. On the labour market side Volvo has to take into account a future situation where there may again be a lack of highly skilled car-builders - even if we will not return to the almost negligible unemployment during the recent overheated period. In the late 80's turnover in the Gothenburg plant was as high as 30 % making efficient operation of the plant difficult. With future similar labour market situations the plant will run into the same difficulties and the lean production and kaizen-activities envisaged as the keys to the further development of Torslanda's productivity would be quasi impossible.

On the product-market there is an increasing demand for flexibility, good quality and a steady stream of new models. If the management of Volvo quickly wants to correct a sales projection then Kalmar, but first of all the Uddevalla model is in a strong position compared with the more inflexible Torslanda plant. In the Uddevalla model it is easy to change the volume of production: it can be varied by the opening or closing of a "miniplant". This quantitative flexibility in Uddevalla is surpassed only by its unique qualitative flexibility that allows the individual customer's wishes to be met.
The plant in Uddevalla is a model for the flexible specialization or differentiated quality production that unites production on a large scale with customer-orientation. The plant can sell directly to customers and car dealers in the region and can also ship directly from port. And, more advanced: some customers could even be with the builders at the final assembly, before taking away the car. At the time when the decision to close the Uddevalla plant came, 70 % of the cars were built for specific customers. Such customer-oriented made-to-order cars command a higher price.

Torslanda and other conventional factories build cars according to a plan made from sales projections for different models and variations. If the cars in stock do not fully correspond to the wishes of the customer the stocks of unsold cars grow at the high price of 100 Sw. Kronor per day. The sales staff are forced to give price reductions at the last minute. With today's overproduction, the customer is the king and the reductions are estimated to between 1000 and 4000 Sw. Kronor. The cost of finished car stock in Torslanda (on average 10 weeks) is 7.000 Kronor and this is equal to the total manpower cost for assembly of one car. Adding the higher sales price for Uddevalla cars, i.e. recognizing Uddevallas market advantages, Uddevalla seems unbeatable for Torslanda and other conventional plants.

With an overproduction of more and more technically advanced and often similar cars on a mature market, there is a tendency for new demands for quality from the customers to be important, e.g. environmental considerations. The more human way of producing the car is also a competitive advantage for Volvo - one which GM stresses in its recent advertisements for the Saturn car produced in GM:s factory with the same name. Kalmar and Uddevalla are, in international working life, cultural institutions. Uddevalla stands head and shoulders above the Saturn plant. Volvo has not only achieved the remarkable combination of rewarding and productive industrial work in totally breaking with line production and building real group work. It has also come far where the equality between the sexes is concerned: 40% of the employees in assembly work in Uddevalla are women, and work positions and tools are being adjusted for them in a unique way. Kalmar and Uddevalla are a part of Volvo's selling image for producing a different car. Like other advantages on the revenue side this contribution is not included in Volvo's calculation.

7. NARROW MANAGEMENT FOCUS

Volvo's management however focussed on efficient assembly and did not fully understand, let alone use the potential of the market end of the plant in Uddevalla, and especially not the possibility to produce unique cars that are made to order. They did not even let Uddevalla build special cars like police cars and ambulances although groups there build such special cars in less workhours than it takes the Torslanda plant to strip a standard car (already assembled using around 40 hours) and add special parts and equipment. - Soon after the close-down in Uddevalla Volvo management announced, however, its intention to let a miniversion of the Uddevalla production model survive within the Torslanda plant, for assembly of special cars with a limited volume totalling around 2000 vehicles per year. This decision may allow the production model to survive on a small scale, and it may make further research and development possible. It does not, however, allow for a continued full scale development of a relatively large volume and at the same time customer-oriented production - the unique feature of the Uddevalla plant. Given earlier negative experiences of efforts to introduce new forms of
assembly within the Torslanda plant, special preconditions must probably be created to ensure
the future development of the Uddevalla model there.29

Uddevalla was, during its first three years, busy adopting its new production-concept. At the
same time as it could show Volvo's group management that it could produce cars at least as
efficiently as Torslanda, it had also recently introduced almost complete production to
individual customer orders and it was ready to start to use and develop its marketing strength -
then the news came that management intended to close Volvo's best shops.

Correcting the cost calculations and adding the extra revenues in the Uddevalla model the
closing is probably simply an economic loss. But all these quantitative estimations are. difficult.
Volvo has not made public the basis for its decisions - which could have been expected of a
company traditionally proud of its openness and having received public support amounting to
hundreds of million Sw. Kronor - or several billion Kronor if you include taxexempted
investment funds.

It is thus difficult to see this decision as economically motivated even when seen in a relatively
short-term perspective. Management's calculations appear to serve to justify a decision that has
been taken on other grounds. That is not an unusual phenomenon.

If the consequences of the those costcutting reductions in capacity become strategic in the sense
that two innovative plants are closed and a conventional line plant remains - the decision is in
fact strategic. Volvo leaves twenty years of sociotechnical renewal and seems to approach the
toyotist line. When Volvo denies this aspect it may very well be "manging its way into
economic decline"30. It seems that Volvo has a problem with a double command in its
leadership. Former managing director, now chairman of the Volvo board, Pehr G.
Gyllenhammar stood for costly visions. They are closed by the new managing director Gyll's
costcutting program - in a moment when they in fact are surpassing the performance of the
conventional Torslanda plant.

8. VOLVO'S REAL WEAKNESSES

One of Volvo's weaknesses has been the slow and expensive way it has developed new
models. The latest, the 850, took nine years to develop. Volvo invested much of its profits
during the 80's diversifying into food and pharmaceuticals rather than concentrating on its core
business. Volvo's cars, like other European cars in an equivalent class and production-volume,
have also been difficult to assemble. An unrealistically large production capacity has been built
up and as it turned out, inefficient staff, especially on the marketing and design end. The walls
between construction, production and market functions have been high.

In the case of Uddevalla, Volvo as a whole has not been able to take advantage of its specific
potential - due to the unique competence of the workers - of possibilities of continuous learning
and to rationalize indirect work and of interaction with construction and sales. But the
Uddevalla production concept belongs to the future, as board chairman Gyllenhammar admitted
after the closure decision.31 Several other parts of the Volvo organization do not. Capacity
reductions and drastic savings were needed, but the new management was cutting where

29 See Jan Ake Granath: Arch~tecture, technology and human factors, Chalmers University of Technology,
30 Robert H Hayes snd William J Abernathy: "Managing our way to economic decline", Harvard Business
31 Pehr G Gyllenhammar in Dagens Nyheter April 1, 1993.
resistance was weakest, in the new and peripheral production units - a phenomenon known from similar situations in other companies.

9. ORGANIZATIONAL POLITICS AND DOMINATING IDEAS

The calculations above, do not explain Volvo's decision. They must be put into a sociological context which makes it possible to begin to grasp internal politics and dominating ideas within the company. One explanation of the decision to close down Kalmar and Uddevalla can be the "battle of ideas" that is going on inside Volvo between traditionalists and innovators. As early as 1989 the Swedish journal *Ny Teknik* reported that one group-manager in Volvo said of the "Uddevalla-experiment" that it was connected with Sweden's tight labour market and said that if Volvo moved its production to the Baltic States or to Southeast Asia, then the probable model would be Taylorism. The same could be said of Volvo's present investigations of a possible assembly plant for the 240-series in St. Petersburg, Russia.

Over the years the Volvo group management, and P G Gyllenhammar, has supported Uddevalla, but not wholeheartedly enough, and not as the futureorientated embryo of a rethinking and restructuring of the totality of construction, production and sales of Volvo cars. Uddevalla was an innovative part in a traditional company. By many it was regarded as an experiment to be closed in tougher times.

Innovation has been born and developed by Uddevalla and Kalmar as well as by Volvo's bus and lorry production in different parts of the country. The traditionalists are strong in Gothenburg at management level and has to some extent been so also in the unions. In a power struggle, Torslanda and Gothenburg has the numerical advantage. It also is the "cradle" of the company. The Gothenburg-based Volvo group unions defence of the decision to close Kalmar and Uddevalla is probably rather an effect of the geographical location of the plants, than of their lack of understanding of the unique qualities of the new factories. The former to them seems to have been more important than the latter.

Although Renault is probably more innovative than Volvo in design and marketing and in building its subcontractor system, within the sphere of work organization the traditionalists are likely to have been strengthened by Renault's entry to the scene. Renault is adopting a toyotist production system with short job cycles, kaizen, Japanese style teams etc. Also the need for interplant comparisons and the possibilities of moving production between units, that the alliance with Renault may bring about, may put pressure on the smaller and lately less profitable Volvo to adapt to facilitate teh creation of a common production network. Pioneers face opposition to their ideas, as well as big costs of entry. A consultant's report for the French government is very critical of the set-up in Kalmar and Uddevalla: Their "production model has reached its limits, and has no place in todays competitive context". And Renault is in a strong position after a successful year following investment in Japanese style rationalization. It may be a case of two production cultures colliding. The Uddevalla unbureaucratic organization with competent teams without supervisors may seem incomprehensible. Its mere existence points at enormous needs for investments and renewal of organization, training and culture in existing plants. French auto unions, like many others, on the other hand have looked upon Kalmar and Uddevalla as models for the future.

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32 Karel Williams snd Colin Haslam in *DaRens Nyheter* March 27 1993
33 Article by Maria Hammaren, in the journal *Ny Teknik*, spring 1989.
The consequences of the alliance with Renault may, in summary, be regarded in two perspectives. First, there may be good policy reasons, at least in the short and medium turn, to close plants like Uddevalla and Kalmar that differ fundamentally in philosophy and layout from other Volvo and especially Renault assembly plants. Coordination of production networks and also ideological coherence may be easier with a more streamlined set-up of plants; such arguments have however not been presented by Volvo. The second aspect is, as we have seen, organizational politics, the struggle between different dominating ideas within Volvo and between Volvo and Renault. Both aspects contribute to a close down that deprives the alliance of its most innovative production units.

The reduction of volume, and for that reason "village-political" antagonism between workplaces in the Volvo group, together with a change in management of the company and the entrance of Renault, could be seen as releasing factors for the shift in balance between opposing dominating ideas. Another important background for the closing of Uddevalla is the present high unemployment level in Sweden which makes the need and demand for good jobs weaker.

The decisions to close down these modern plants have a great significance for what is going to be the defining ideas of a future united Renault-Volvo. With the model plants gone and the "victors" writing the history, Uddevalla can end up being seen as a luxurious arctic deviation from the "one best way" in industrial organization, i.e. "Toyotism" or "lean production" with European companies trying to compete with the Japanese companies on their ground.

For Renault the present popularity of "lean production" may become a conceptual tool in the organizational politics that will determine the balance in the ongoing integration between Volvo and Renault. With Renault's economical strength and suffering on the wave of lean production Volvo runs the risk of becoming economically and ideologically very dependent on Renault. For Sweden there may be a risk of losing parts of its industrial base and finding itself in the periphery of European production networks and hierarchies.

Industrial managers from around Europe can be heard saying that Volvo's European alternative to Japanization obviously was not economically viable. In the worlds of researchers, consultants and trade unionists it is asked: "What is happening up there?" They have all looked upon Kalmar and Uddevalla as leading examples and symbols of how it is possible to unite productivity and good jobs. Also Japan's industrial sociologists gathered for an annual conference in Fukuoka in 1992, were studying Sweden, especially the Uddevalla plant, and two other countries to look for alternatives to Japanese industrial organization.

The breakthrough for Volvo's unique production concept has been great as great as the fall may now be. The fall seems to convey the message that all "realistic" traditionalists were right. It is not strange. Although Volvo officially informs that all three factories were equally productive, the Uddevalla plant was in fact closed, and the Kalmar plant is announced to be closed in 1994.

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35 The discussion of dominating ideas and releasing factors owes much to Albert Danielsson, see e.g. *Samtal om ledarskap, ledning och ledare*, Svenska Dagbladets forlag, Stockholm 1986
36 Williams and Haslam, ibid.
10. TRADE UNION SILENCE

True, one can read in the local newspaper Bohuslanningen about the protests of the workplace unions in the Kalmar and Uddevalla plants and about the performance of the Uddevalla plant. But the Volvo group union organizations in Gothenburg and the national trade union organizations, as well as many researchers in the sphere around Volvo, have been curiously quiet. The Swedish metal workers union did little in public to defend the plant, whose creation was partially dependent on its forceful support in earlier critical stages. The union silence is astonishing given the Metal workers'unions pioneering and longstanding commitment to what it calls "the good jobs" and "solidaristic work policy". This experience shows there is a long way to go, until solidaristic work policy is implemented in practice. 37

If the cost calculations and performance figures like assembly time etc presented in this article are correct - and in the public debate Volvo did not go into a serious discussion of those calculations - one would have expected a reconsideration by the Volvo group unions of its acceptance of the closures; with equal performance good jobs should be saved rather than hard line jobs. But they did not even defend the plants in symbolic manifestations. They are now unnecessarily weakening the idea of rewarding work as the basis for union policy.

Through the years Pehr G. Gyllenhammar has said, and showed, that he believes in Sweden and in the car workers as active and competent people. The plant in Uddevalla is the jewel in the crown, created through co-operation between the management and innovators among the production-technicians, trade union representatives and researchers in industrial technology and work-organization from Chalmers Institute of Technology and the Gothenburg University. It may be seen as an expression of a "new Swedish model" with the focus on the workplace and support of visions, agreements and expertise from a central level. The beautifully designed plant in Uddevalla could have become a symbol for the nineties, a renewal of work life and industrial relations, as important as the hotel in Saltsjobaden where the historical compromise between labour and capital was made. 38

11. THE PLANT IS CLOSED BUT THE IDEAS BELONG TO THE FUTURE

Can Volvo's unique concept in Uddevalla survive? The fordist factory model and the refinements of toyotism are overwhelmingly dominant. Volvo management did not have the stamina which would allow Uddevalla and Kalmar to survive today's difficult situation of need for cost cuts and waiting for a broader breakthrough for their ideas.

The last cars left the groups in Uddevalla Friday the 16th and Monday the 19th of April. Two days later the Volvo shareholders' meeting was held in Gothenburg. Board chairman Pehr G Gyllenhammar regretted the closures. Managing Director Gyll talked about cost cuts. The share holders asked about Gyllenhammer's salary, only a few researchers present discussed Volvo's strategic alternatives in deciding upon production concept and plants of the future. Except for a few articles by Swedish and international researchers all was silence in the national press and debate. It will need some research and thinking to understand and draw scientific and practical conclusions of this sad process.

37 This theme is further developed in my article "Justice at work" to be published in a volume with the preliminary title Market economy and social justice, edited by Akihiro Ishikawa et al, Chuo University, Tokyo spring 1994.
38 Recent developments in work organization and industrial relations are discussed in our book Technological Change and Co-determination in Sweden (Sandberg et al, Temple University Press, Philadelphia 1992)
A critical reading of the management's calculations, and public debate, did not save the Uddevalla plant, but a well-grounded record may preserve the ideas and the concepts for more insightful future-oriented companies as well as for the union members in Sweden and in other countries. Around the world the concepts of productivity through human beings, not against their potential, live on, adapted as they are to the customer's and the worker's growing demands for quality.

For example ABB in Sweden has a comprehensive program for organizational renewal with post-fordist ambitions - the outcome of that we do however not yet know. In companies with successful renewal we find a complete strategy with an efficient interplay between product development, construction, production and marketing. The "good work" and efficient production are developed concurrently. The one does not automatically follow from the other. ABB seems to have such a strategy from order to delivery, from product development to sales, and also an integrated view of work leading to "co-worker agreements" with local unions challenging the Swedish union structure with the separation between blue collar workers in LO unions and white collar employees in TCO and SACO unions. Only recently the latter agreements have forced the Swedish unions to catch up.

Today there is an international search for alternatives to taylorism and the fordist assembly-line which has dominated since Model T. The outcome is not clear. Uddevalla is a radical, vigorous alternative to the toyotist production concept which may be regarded as a sophistication of taylorism with its short-cycle jobs, automation and employees who are supposed to engage in constant, stringent rationalization of their own work and whose performance and motivation are continuously assessed. Toyotism's superior productivity must also be understood as a product of design-for-assembly, and long term relations with sub-contractors and with the core of highly educated workers. The subcontractor system with networks for production and development work is efficient and the low costs are further reduced due to lower wages and inferior job security and working conditions on lower levels in the subcontractor pyramid. Such a dual labour market is particularly alien to the traditional Swedish labour market model of solidaristic wages with national agreements independent of company.

The toyotist organization of the work itself is today questioned in Japan, not only by trade union organizations - now criticizing Japanese auto producers from several perspectives: working hours, working conditions, work load and overwork; competitive strategies, international trade relations, and ecology etc., but even by Tadaaki Jagawa, a manager of Toyota, who wrote a year ago in The Japan Times that it "was a mistake to design such gloomy factories. I wish we had used more of our profits to improve the working conditions". Protests against bad working and living conditions and difficulties in recruiting workers despite the unemployment are new trends in Japan, as well as a declining market demand both abroad and at home. Toyota has located its newest plant in the southern island Kyushu where recruitment to auto industry jobs is easier than in central Japan. The assembly line in the Kyushu plant is divided into 11 parts with buffers in between; work environment and ergonomics are substantially improved as compared to older plants, and automation level is initially lower and may be further developed with worker participation. In Germany the Mercedes plant in Rastatt, as well as the planned rebuilding of other plants, have been inspired by Uddevalla.

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39 Rianne Mahon, Carleton University, who is visiting Arbetslivscentrum, is currently studying these developments. See also her articles on "solidaristic work policy" and post-fordism in the journal Economic and Industrial Democracy 1987 (Vol 8, No 1) and 1991 (Vol 12, No 3).

Several Japanese subcontractors now develop and produce their own bodies and they assemble complete cars in short series oriented to small segments of customers. Although work environment is improved in the large car plants short job cycles (tact time) seems still to be a dogma. But perhaps the Uddevalla production model has a basis for further application in the small volume car producers in the near future. And in a more long term perspective, with growing worker demands for job quality also in Japan, perhaps the Uddevalla model may have a role to play also in a future postlean production concept for volume car producers: Automation of heavy and simple tasks plus human-centered group work for the remaining tasks.

"Lean production" and Toyotism do not mean the end of the history of industrial organization. Human and productive alternatives have a place in the demanding labour and product markets of the future.
REFERENCES AND ACKNOWLEDGEMENTS

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