THE FIGHT AGAINST TAYLORISM IN EUROPE

STRATEGIES, ACHIEVEMENTS IN JOB DESIGN AND TECHNOLOGY, SETBACKS, OBSTACLES, CHANCES FOR UPGRADING WORK

(DE STRIJD TEGEN HET TAYLORISME IN EUROPA. STRATEGIEËN, PRESTATIES OP HET GEBIED VAN HET ONTWERP VAN ARBEIDSPLAATSEN EN VAN TECHNOLOGIE, TERUGSLAGEN, OBSTAKELS, KANSEN VOOR VERBETERING VAN HET WERK)

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Preface

Studying initiatives for change tends to make one *sadder but wiser*. Beyond a certain point, however, a change in perspective sets in; both the opportunities and the pitfalls are seen more clearly. The purpose of this book is to give you, the reader, a shortcut to the latter more informed position.

In the field of organization, fads come and go out of fashion ever so often. However, you will find the subject covered in this book to be relatively timeless.

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Hans Pruijt
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INTRODUCTION

On the surface, Europe seems to adopt its organization of work entirely from other parts of the world: first by deepening the division between thinking and doing according to the principles of classical Taylorism, later by embracing neo-Tayloristic trends like lean production from Japan and McDonaldization from the U.S.

There is, however, a countermovement. In some organizations, innovative managers, staff personnel and union groups are pursuing anti-Tayloristic[1] strategies. They receive support from researchers who, combining consultancy and research, accumulate expertise on changing working life and feed this back into organizations. National unions have supplemented their bread-and-butter activities with involvement in the organization of work. So did politicians, who, in several countries, pressed for working life legislation that covers work organization as much as health and safety. And in Scandinavia and Germany, there are state-sponsored research and development programs that explore alternatives to Taylorism. These programs include efforts to develop technologies that do not have a Taylorist bias and that could support change in organizations. This book addresses the following questions:

- What types of initiatives does this countermovement consist of?
- To what extent can these types of initiatives be successful in bringing about durable change at the shop floor level?
- How can differences in the effectiveness between these types of initiatives be explained?

There are several reasons why these questions are interesting:

Reason #1: The existence and the continuing emergence of jobs that are at odds with the ideals of self-realization, freedom and democracy have been branded as a social problem. There are many studies that explore this social problem by tracing the development of the labor process in terms of:

- the possibilities for workers to exercise and develop their skills, sometimes called the "complexity of work", or the extent to which the work is interesting or challenging;
- autonomy;
- influence on the work process beyond the immediate personal work environment.

These studies have shown, that at least a substantial part of the jobs exhibit less of these three qualities than technological and economic development would allow. This prompts some of the authors to recommend policies that imply a belief in a certain malleability of the quality of working life. Kern and Schumann (1984: 323-327), for example, recommend a policy of modernization that promotes professionalization in

industry.[2] Also policy-oriented reports (e.g. by the OECD: Delors et al. 1975: 14-15) have called for job enrichment, for greater worker participation in decision-making and for the development of humanized technology.

The answers to the research questions posed in the present study will indicate how realistic these recommendations are.

Reason #2: To get a sense of the level of realism of anti-Tayloristic policy, one would like to see comprehensive policy reviews. Such reviews exist (e.g. Den Hertog and Schröder 1989, Auer, Tergeist and Penth 1983), but generally they do not provide information about actual resulting change on the shop floor level. In other words, it is not clear whether the policies are just theoretical change or entail real change.

Reason #3: There are studies that do provide information about the actual resulting change on the shop floor level. However, these are generally (and understandably) restricted to a limited context, like a particular development program such as the German Humanization of Working Life Program, a particular type of working arrangement like teamworking, a particular design approach (like integral sociotechnical design) or a particular type of actor (e. g. unions). Without attempts to compare between different policies and between cases in different contexts, it will be hard to find out what works best and why.

Reason #4: When browsing through the literature, one finds widely divergent sweeping statements on the general character of anti-Tayloristic policy. For example, Auer, Tergeist and Penth (1983: 12) describe humanization of working life (a term widely used in Germany) as: "New forms of work organization, designing jobs and work environments that do justice to humans, social cushioning of technical innovation and cooperation of dependent employees in the changes that affect them". On the other hand, Doorewaard (1989: 52) sees humanization of working life, job redesign and work structuring as "control strategies". In contrast with this view, McGregor (1970: 315) sees it as a mode of organizing in which management makes it possible for workers to develop their intrinsic motivation, capacity for development, capacity for assuming responsibility and readiness to direct behavior towards organizational goals. Kelly (1982), on the other hand, sees job redesign primarily as adaptation of the organization of work to turbulence in product markets while intensifying work. He emphasizes extrinsic motivation as a factor that leads to higher productivity after job redesign. Braverman (1974: 39) views work reform as "a style of management rather than a genuine change in the position of the worker", while Ramsay (1985: 59) analyses the phenomenon as concessions that managers make in times when their legitimacy is threatened.

These are just a few examples. The sheer variety of interpretations suggests that their is room for further clarification of the nature of anti-Tayloristic policy.

Reason #5: Many writers have expressed the opinion that Taylorism is obsolete, that there are ways to organize work differently ("organizational choice"), and that managers *should* depart from the Taylorist way. However, broad based empirical studies to determine the depth and breadth of the expected transformation (e.g. Child and Loveridge 1990, Schumann et al. 1994, Huys, Sels and Van Hootegem 1995) have shown that this vision has not become a widespread reality. (The first chapter covers this persistency of Taylorism in some depth.) Studying the ups and downs of those organizations that did take the plunge to depart from Taylorism might help explain why the transformation did not materialize to the extent that many had hoped for. No discussion of work is complete without an attempt to answer the question whether the reality described is the only possible reality; social reality reveals itself best when one tries to change it.

The main part of the study consists of an analysis of attempts within organizations in Germany, The Netherlands, the U.K., Sweden and Norway to break with Taylorism. The reason for choosing Sweden was the high level of activity in this area. Internationally, Sweden seemed an exception with respect to worker influence on the introduction of new technology (Levie and Moore 1984a, 1984b, 1984c, Levie 1985). A good sign for worker influence in Sweden is that more than 90 per cent of the workforce is organized in unions. In the 1980's, many working life researchers in Western Europe and in the U.S. saw Scandinavia as an Eldorado for worker influence on job design (Buitelaar and Vreeman 1985: 582-586, Howard 1986: 208-209, Gill 1985: 140-160). Germany seemed interesting because of the massive (generally around 100 million DM a year) state involvement through the programs "Humanization of Working Life" and "Work and Technology". I included Norway when it became clear that both government sponsored development programs and legislation with an anti-Tayloristic content originated there. The U.K. is important for historic reasons, having been the scene for pioneering change projects; the U.K. also offers contemporary technological developments that are relevant for this study. And in The Netherlands, high-profile events are far and few between, but in several firms, managers and unions in their own way and aided by consultants, are quietly trying to move away from Taylorism.

The analysis does not stop at the company level. Instead, the various activities designed for promoting change in organizations were the object of study as well.

Box 0.1 The principles of Taylorism

"Taylorism" (after Frederick Winslow Taylor, management expert, 1856 - 1915) has become a catchword for management strategies that lead to impoverished jobs. (Impoverished in the sense that skill content and autonomy are going down and that workers are allowed less influence on the work process at large.)

The central feature of Taylorism is the separation of conception from execution. Managers achieve this by applying three principles. The first principle of "scientific management" as Taylor called it, is the decoupling of the labor process from the skills of the workers: "The managers assume [..] the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws, and formulae" (in Braverman 1974: 112).

The second principle is: "All possible brain work should be removed from the shop and centered in the planning or laying-out department" (in Braverman 1974: 113).

The third principle is, that management should not leave it to the workers to decide how they go about their tasks. Instead, management should prescribe exactly how, and how fast, the tasks must be performed. The main reason for doing this is to prevent workers from holding their output down.

Taylorism is a refinement of the management strategy of detailed division of labor. It is important to draw a sharp distinction between detailed division of labor and specialization. Through specialization, people can develop themselves further in their crafts or professions; whereas detailed division of labor reduces people to performers of routine tasks. Detailed division of labor entails analyzing a production process and breaking it down into a multitude of tasks performed by different workers. In this way, a craft-based labor process, that was once controlled by the workers themselves, falls to pieces. Then, managers put the pieces together to create a process that is under managements' control. The financial advantage of is this strategy is that it becomes possible to hire less well-paid workers. This principle was already clearly stated by Charles Babbage in 1832, the same Charles Babbage who devised the first computer architecture. (Braverman 1974: 188). Taylorism tends to carry the detailed division of labor to new extremes, where work cycles are measured in seconds.[3]

Taylorism implies low-trust relations between employer and employees. Therefore direct control is needed to ensure that labor power bought is turned into labor performed. This control question urges managers to find ways of imposing on workers what they should do, in what way, within which limits and at what pace, and to evaluate work performance and apply sanctions. Taylor's prescriptions amounted to reliance on a raft of

supervisors, but the Ford Motor Company proved that a mechanically paced assembly line is a more efficient control system. The assembly line functions as a system of technical control, which means that the entire production process or large segments of it are based on a technology which regulates the working pace and controls the labor process (Edwards 1979: 112-113). The assembly line supplants the direct conflict between worker and foreman.

CHAPTER ONE TAYLORISM AND ANTI-TAYLORISM

1.1 Introduction

A possible reaction to anti-Tayloristic policy is skepticism about its relevance, based on a feeling that Taylorism is on the way out anyhow. (An example of an influential publication that leans heavily in this direction is: Womack, Jones and Roos 1990.) The first part of this chapter will show that, on the contrary, Taylorism exhibits considerable persistence.

The last part of this chapter is an overview of the study as a whole. This overview, at the same time, introduces the basic structure of anti-Tayloristic policy.

1.2 The persistence of Taylorism

Scientific management, as an explicit method, became unfashionable after the 1930's. Its principles, however, continued to have an impact on the design of jobs, up to this day (Braverman 1974: 119, De Sitter 1981: 21, Schumann et al. 1989: 67). Examples are:

- In banks and insurance companies there is a tendency to permanently analyze and standardize the work. The routine tasks are relegated to a category of workers who are only engaged in "bulk" work, and who have to work according to strictly specified rules. An elite group handles the more complicated, incidental cases. The work of this elite group is permanently analyzed to see if parts can be formalized and transferred to the bulk group (Doorewaard 1986).
- Planned automation can be an impetus for routinization and standardization of work, as an intermediate step towards automation.
- Even the organization of software development itself now shows a Tayloristic pattern, with its division of labor between, on the one hand, analysts and designers, and on the other hand, programmers (Philip Kraft 1979: 10-12).
- In the early 1990's, a labor shortage in the Dutch health care sector prompted managers to tap the reservoir of people with little formal education.[4] To create special jobs for this category of workers, they split-off simple tasks from nurses' jobs. Subsequently, a Labor Party committee took this as a model solution for the problem of creating jobs for the disadvantaged.[5]

- Finally, the rise of the McDonals-type firm ("McDonaldization") (Ritzer 1993), saturated by predictability and controllability, testifies to the vitality of the Tayloristic organization concepts.

Some, for example Blauner (1964) and Woodward (1958) saw automation and information technology as factors that tend to upgrade work and to put workers back into control of the labor process. However, it is easy to identify several ways in which automation and information technology can deepen Taylorist patterns.

Depending on how it is used, information technology facilitates Taylorist division of labor. An example of an application that can strengthen the separation of conception from execution is Numerical Control (NC).

Box 1.1 Numerical Control

An important technology in the discussion about Taylorism is Numerical Control (NC). A changeover from hand control to numerical control facilitates a division between, on the one hand, planning and programming, and, on the other hand, unskilled operator work (Braverman 1974: 197-206, Noble 1983). NC is an example of the way in which Tayloristic views can influence the development of technologies, that in turn influence the organization of work. In his study on the coming into existence of the NC technology, Noble (1983: 86) emphasizes that technology has a social history. The design process involves choice, the selection or discarding of alternatives. Social relations affect these choices. This is not a clear-cut process; the outcome of technological development is characterized by a large proportion of unintended consequences.

Originally, two competing principles guided the development of automatic machine tools:

a) The "record playback" principle, i.e. that a skilled worker uses hand control to produce a first piece of work, which is then automatically copied to produce the required number of products. This technology depends upon the skilled worker.

b) The NC principle in which the instructions for the machine are delivered on tape. This system makes a division of labor between programming and operating possible.

The NC principle prevailed, to a large extent, because of financial support from the defense sector. The military wanted to avoid the presence on the shop floor of blueprints of military equipment.

NC makes the division of labor between programming and operating the most likely work organization. However, there is no complete determination: apart from programming in a separate department, programming on the shop floor itself is possible.

Further development brought the CNC (Computer Numerically Controlled) machine. CNC technology makes shop floor programming easier to realize (Gill 1985: 77, Sorge et al. 1983).

The next step in the development is the DNC (Directly Numerically Controlled) machine. In DNC, there is a direct connection between the CAD (Computer Aided Design) system and the machine tools. This implies the disappearance of programming, and with it, the opportunity for shop floor programming.

The creation of data-entry work is a current example of detailed division of labor, leading to dead-end jobs, particularly for women. Information technology makes this kind of division of labor more feasible, because transporting information becomes easier. This enables firms to tap the labor markets of home workers and the labor markets in low-wage countries.

Through automatic data collection and feedback loops, the introduction of computer technology widens the possibilities for technical control systems. Management does not actually have to use the computer-collected information to control the workforce, but it reserves the power to do so. This is the "panoptical" principle: all subjects know that they can be observed from a central point, but they have no way of knowing whether, at a given moment, actual surveillance takes place (Foucault 1975: 197-229). A study by the U.S. Office for Technology Assessment uncovered a system connected to a set of CNC machines that registered production data. These data were used against the "banking" of work, which workers did to maximize bonuses (Gill 1985: 85). Automatic registration of work performance occurs in the financial and telecommunications sectors. Figures for the number of Americans who work under some form of computer surveillance range from seven to fifteen million.[6] In the early 1990's, software products that allow managers to see exactly what users are doing at their PC's or terminals became widely available.

Logistic information systems can issue instructions to workers and then check whether the instructions are executed within the specified time. In the supermarket company Albert Heijn, warehouse workers use magnetic cards to signal the production control system after the completion of each task.[7] Some companies practice paperless order picking:

> "In this method each worker is assigned to a section of an aisle. You enter the order you are going to pick. For the rest, the computer takes care of everything. You pick up a box and all you have to do is to look for the nearest red signal light. You walk towards that shelf. On a tiny display you can see how many products you have to pick. Are you ready, then press a button next

to the display. At the next product, a signal lamp lights up."
(Kooistra and Tom 1992: 18)

Kooistra and Tom (1992: 19) report a trend that information systems determine storage locations, thereby robbing workers of the opportunity to create efficient storage schemes. They just have to do what the information system tells them to do.

Continuously increasing are the possibilities for the incorporation of skills and decision-making into automatic machinery and information systems, and thus for the removal of brain work from the shop floor - a key element of Taylorism. In a classic study, R. Bright distinguishes four main levels of mechanization in industry:
1) "Hand control";
2) "Mechanical control";
3) "Variable control, signal response" (i.e. the machine provides information about the progress of the production process);
4) "Variable control, action response" (the machine is capable of self-correcting actions).
Bright notes, especially in the fourth group, a degradation of the level of skill needed to operate the machines (Braverman 1974: 218). Wilkinson (1982: 42-44) describes how the use of automatic machines for the production of lenses for glasses led to a change from highly skilled craftsmen to semi-skilled machine operators. Other examples of machines that embody skills are blood analyzing machines and automatic photo-developing machines.

Information systems tend to enforce a fixed way of entering information. Decision rules can be incorporated in the system as well. In a case study on automation in the insurance industry, Rolfe (1986: 42) observes:

"Task variety is small, and the range of tasks has reduced, particularly since information is immediately accessible and premiums calculated automatically. Much of the clerk's working day is spent in routine processing and dealing with enquiries. The administration manager considered it 'flattering' to call the clerks underwriters, stating that 'zombies' could do much of the work and that underwriting is now a 'process'."

Box 1.2 Expert Systems

A subdiscipline of computer science, Artificial Intelligence, is partly devoted to enabling computers to take over skilled tasks. In contrast with traditional automation, AI deals with problems for which no algorithmic solutions are known (i.e. that not all steps leading to the solution are

known). One of the most flourishing areas is that of expert systems. An expert system is a program for solving decision or judgement problems, on the basis of built-in expertise that was gained from human experts. The principle is that a "knowledge engineer" interviews experts and tries to make their expertise as explicit as possible. This process of "elicitation" is difficult because, to a large extent, expertise consists of intangible rules of thumb and heuristics; reluctance of experts to give away valuable knowledge may be a complicating factor.

One way to represent knowledge in an expert system is to use "production rules", rules with an IF .. THEN structure. The expert system includes a knowledge base of production rules and an inference engine that selects rules and takes appropriate action. Possible actions could be: asking the user - who is consulting the system - for information, performing calculations, looking up information in a database, etc.

The yardstick for success is whether or not the expert system matches or improves upon the accuracy of human experts. This line of development in computer science is more oriented towards competing with humans, than with supporting them.

An example of a successful expert system is Digital Equipment Corporation's XCON. XCON's purpose is to configure the VAX line of computers. Each VAX is an often unique combination of thousands of parts. A first abortive attempt was to automate parts of this process in a traditional way. A big handicap was that the project meant "aiming at a moving target", because of the constant introduction of new parts and options (Scown 1985: 114). An expert system, growing to around 4200 production rules, proved accurate in ca. 95 percent of the cases.

An addition to XCON was XSEL, an expert system designed for assisting salespeople in making quotations. The possible threat to salespeople was well recognized by one of DEC's managers: "Naturally, salespeople could be very threatened by this type of expert system. Imagine the plight of a computer-systems salesperson with ten or twelve years experience, who could go to a customer or prospect and using his or her wealth of accumulated knowledge, prepare the framework of a quotation with only minimal reference to technical documentation. Now, all of a sudden, a portable terminal and a remote computer are part of the salesperson's toolkit. The salesperson is now, potentially, portrayed as having to rely on the computer and expert system, thus appearing less self-sufficient." (Arnold Kraft 1984: 46)

In 1984, the book "Das Ende der Arbeitsteilung?" ("The End of the Division of Labor?") by Kern and Schumann initiated a discussion about a possible end to the detailed division of labor. A similar proposition was made by Piore and Sabel (1984), who claimed that flexible technology and

fragmentation of markets would usher in an era of "flexible specialization".

Kern and Schumann (1984: 19) proclaimed a rise of "new production concepts" in the core sectors of German industry, the automobile, machine tools and chemical industries. These new production concepts revolve around greater respect for skill and worker involvement. This means that in the core sectors, the polarization between elite and routine workers is coming to an end. Product quality, flexibility and enabling technology are given as reasons for this change. But Kern and Schumann specifically state that this change is restricted to the core sectors. For example, in the food industry, they could trace no such development. In a follow-up study (Schumann et al. 1989), the change process in the car industry proved slower than expected. Even in 1983 and 1989, two new, traditionally organized car assembly plants were put into service.

An important point in the theory of new production concepts is the appearance on the scene of a new category of workers, the "system regulators". System regulators monitor the actions of automated machinery and intervene when they deviate from their programmed course. But even in an almost completely (99 per cent) automated production phase, like spot welding in body construction, it turned out that few of the workers had risen to system regulator. 95 per cent of them were still engaged in manual welding and correcting faulty weldings. Only five percent of the workers in the spot welding phase were working as system regulators (Schumann et al. 1989). A survey of Dutch case studies from the 1980's detracts from the new production concepts thesis as well. It showed that polarization (between a relatively small number of complex jobs and a large number of simple jobs) was the main trend.[8]

A large-scale study on information technology in the European service sector (Child and Loveridge 1990: 360) concluded that banks rarely exploited the new possibilities of broader access to pooled information and knowledge and that "modifications to existing hierarchies are modest". Huys, Sels and Van Hootegem (1995) found that Belgian car plants did acquire the capability for flexible adaption, but not through discussions among workers. On the contrary, it was sophisticated planning in advance that produced flexibility. Furthermore, management was pushing towards enhanced predictability and uniformity of actions. The researchers could classify only two per cent of the jobs as system regulator jobs. Finally, a mammoth trend study on rationalization in the German car, chemical and machine tool industries (Schumann et al. 1994: 659) concluded that the division between conception and execution proved stronger than expected in "Das Ende der Arbeitsteilung". Professionalization was not a sufficient condition for emancipation. Moreover, the study found that a substantial gap remained between direct

and indirect sectors, between "new production specialists and specialized specialists".

1990 saw the publication of the book "The Machine that Changed the World" by Womack, Jones and Roos. This study compared productivity in seventy automobile assembly plants around the globe, while controlling for various factors like the complexity of the car being made. One of the findings was that the "best" Japanese plant needed 13.2 hours to assemble a car, whereas the "best" European plant needed 22.8 hours for this. The differences between high-productive and low-productive plants prompted one of the researchers to coin the term "lean production". Lean production means producing, in comparison with traditional mass production, a larger variety of products, with less than half the working effort, with less than half the investment in machines, tools and floor space, with less than half of the inventories, and with less defects (Womack, Roos and Jones 1990: 13).

The study sent a shock wave through the automobile industry. In all four automobile firms that I visited in the course of my research - Mercedes-Benz, Volvo, DAF Trucks and ZF Friedrichshafen (supplier of gearboxes and steering gear) - I was assured that moving towards lean production was their paramount goal.

But what is lean production in relation to Taylorism? From "The Machine that changed the World", it is apparent that in lean plants, like in traditional mass production plants, assembly lines are used and that work cycles are around one minute (Womack, Roos and Jones 1990: 101). This means that lean production - in its practical implications for the design of jobs - is not dramatically different from Taylorism. But what about the ideas behind lean production?

The book states clearly that the Toyota Motor Company is the origin of lean production. Secondly, that the Toyota Takaoka plant is the most productive plant in the survey. Therefore it seems that we can safely equate the Toyota Production System to lean production.

Three readily available sources offer insight into the Toyota Production System:

- An account by Taiichi Ohno (1988), who played an important part in the development of the Toyota Production System after 1945.
- A diary by Satoshi Kamata, who recorded half a year of experience as a Toyota worker in "Japan on the passing lane".
- A paper by Paul Adler (1992), who studied "New United Motor Manufacturing, inc" (NUMMI), a U.S. joint venture of Toyota and General Motors. This was formerly a GM plant, which was closed down two years before its reopening as NUMMI. According to "The Machine that changed the World", NUMMI represents an exact copy of the Toyota Production System (Womack, Roos and Jones 1990: 83).

Ohno explains that a goal of the Toyota Production System is: cost reduction independent of economies of scale. This implies a constant search for ways to decrease the number of hours worked per product, independently from volume: "In business, we are always concerned with how to produce more with fewer workers" (Ohno 1988: 67). The way in which Ohno looks at workers boils down to distinguishing "work" from "waste". His ideal is that the movements of the workers consist for a hundred per cent of work that adds value to the product. The forms of waste that should be eliminated are waste through waiting, through production of parts that are not needed or not directly needed, through the production of defective parts, through keeping stores and through unnecessary transport. The tight coupling of activities, caused by the elimination of buffers and enhanced by the kanban system (section x signals section y directly when x needs a product from y), reduces autonomy to a minimum. Adler (1992: 42) confirms that autonomy at NUMMI was less than it had previously been under GM. Pushing back buffer inventories turns the whole factory into a disciplinary machine, because it instantly exposes anyone who steps out of the preordained clockwork rhythm.

The Toyota Production System requires a "standard work sheet" for each task that specifies the allotted cycle time, the order of operations and the standard inventory that is inherent in the task.

Ohno (1988: 67) states that machinery must be "fool proof" and that it should be possible to learn how to operate it in three days. On his first day at Toyota, Satoshi Kamata (1982: 22) found that complexity was not the problem, but that the sheer speed of the line was the difficult part:

> "Somehow, I learn the order of work motions, but I'm totally unable to keep up with the speed of the line. My work gloves make it difficult to grab as many tiny bolts as I need, and how many precious seconds do I waste doing just that? I do my best, but I can barely finish one gear box out of three within the fixed length of time."

Kamata (1982: 87) describes his work and that of his colleagues as: "a kind of lobotomy."

One might argue, as Womack, Roos and Jones do, that automation will do away with routine tasks:

> "Thus by the end of the century we expect that lean-assembly plants will be populated almost entirely by highly skilled problem-solvers whose task will be to think continually of ways to make the system run more smoothly and productively." (Womack, Roos and Jones 1990: 102)

However, from their own study, one can glean that the most productive plant in the survey is at the same time the least automated of the Japanese plants (Womack, Roos and Jones 1990: 94). If one concentrates on the substantial information in "The Machine that Changed the World" (the use of assembly lines, job cycles of around one minute, the equation of Lean Production to the Toyota Production System) rather than on the vague assertions about highly skilled problem solving, the conclusion must be that lean production is neo-Taylorism. If, on the other hand, one is willing to accept the assertions about problem solving, the conclusion that there is at least a Tayloristic side to lean production is still hard to escape

Lean production is to anti-Taylorism what carbon-monoxide is to oxygen. Its strong claim of efficiency (it is hard to argue about Toyota's economic success) makes the lean production concept attractive to managers. It even takes care of the quality of working life, albeit only by asserting that it is all right. The assumption seems to be that when efficiency is good, the quality of working life must automatically be good as well.[9]

1.3 Conclusions on Taylorism

Taylorism (i.e. management strategies based on the separation of conception from execution) is far from dying. To this day, it continues to be widespread. There are developments that, on the surface, might represent a break with Taylorism like the far-reaching application of information technology and the appearance of "new production concepts" and "lean production", but these do not constitute its death spell. Although Taylorism has become unfashionable, new Tayloristic impulses like "McDonaldization" are in evidence.

1.4 Anti-Tayloristic policy - brief overview

For years, the obvious waste of human resources and the liberating potential of information technology fostered hopes that the days of Taylorism were numbered. However, as we have seen, massive delivery on this promise did not happen. All along the period studied, there has been a gap between the vision of organizational choice, specifically the idea that non-Tayloristic development is possible, and organizational reality which remained dominated by Taylorism. Bridging this gap were a variety of activities, that, to various extents, attempt to curtail Taylorism or to produce change in the opposite direction. These activities vary in several respects:

- Scale, ranging from small-scale experiment involving a few workers to the design of entire plants.
- Ambition (limited or far-reaching change).
- Motivation (value driven or driven by business requirements).
- Type of work process (flow line, continuous production, office work etc.).
- Sector of the economy (most sectors where Tayloristic patterns exist: industry, retail, finance, insurance, health care, government bureaucracy).
- Directness vis a vis the labor process: whether the change agents are working inside their own organizations, whether they are trying to influence organizational developments from the outside or whether they are active in (inter)national policy arenas.
- Type of change agent: managers, workers, researchers, government policy makers.
- Type of change process (social movement like processes or planned change).
- Type of theoretical frame of reference (for example: various flavors of sociotechnical systems design).

In order to make anti-Tayloristic policy researchable, we need to capture its structure in a conceptual framework. This conceptual framework is depicted in Fig 1.1.
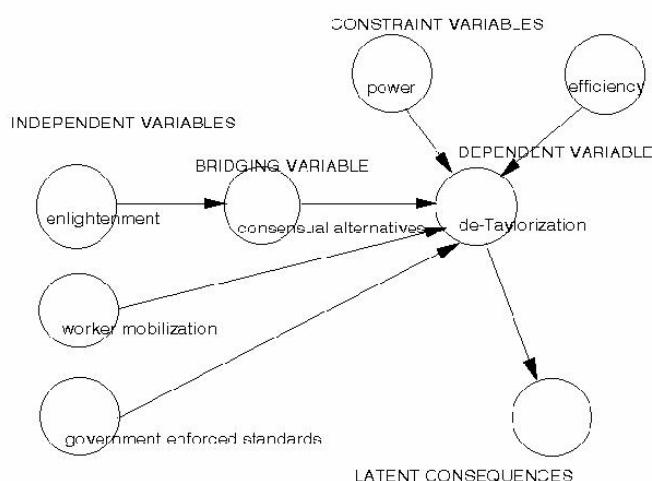
Fig. 1. 1 Conceptual model

This model depicts a (simplified) causal representation of the policy problem. The dependent variable is the level of de-Taylorization of jobs, the intended outcome of anti-Tayloristic policies. The independent variables are three distinct anti-Tayloristic policies.

Within the countermovement to Taylorism, there are three streams of initiatives. One of these streams concerns the variable chain:

enlightenment ® consensual alternatives ® de-Taylorization

Central in this chain is the development of consensual alternatives, i.e. the creation by managers and organization experts of alternative ways of working within their own organizations. They do this primarily because of economic dysfunctions of Taylorism and/or because of moral concerns. The idea that underlies these alternatives is that humanization (i.e. departing from Taylorism) and boosting efficiency are nowadays two sides of the same coin. This implies that, as far as the organization of work is concerned, there is no fundamental conflict of interests between managers and workers. This explains the consensus aspect.

The variable *enlightenment* refers to policies originating from outside the organizations to be changed to promote and support the implementation of consensual alternatives.

Specifically, the *implementation of consensual alternatives* is an intervening variable (i.e. an intermediate outcome between the independent and the dependent variable). The *implementation of consensual alternatives* is an intervening variable of a specific kind, a bridging variable. A bridging variable is an "attitude or behavior necessary to attaining the policy objective but beyond the policy maker's direct control" (Mayer and Greenwood 1980: 126). The implementation of consensual alternatives is beyond the policy makers' direct control because managers act as gatekeepers. External policy makers can try to create optimal conditions for managers to develop the desire to depart from Taylorism. However, they have no control over this.

Chapter Two deals with the dysfunctions and concerns that prompt the implementation of consensual alternatives. Chapter three offers an insight into consensual alternatives. Chapter Four delineates the various enlightenment policies and attempts to trace their effect on the implementation of consensual alternatives. Chapter Five operationalizes the variable *de-Taylorization* of jobs and presents the achievements of 62 cases of consensual alternatives in terms of job design which is the final touchstone for determining to what extent de-Taylorization can be successful.

There are also constraint variables in the model. A constraint variable is "a factor influencing the policy process over which the policy maker has no control" (Mayer and Greenwood 1980: 127). An entire strand in the sociology of labor concentrates on management power. Therefore it seemed necessary to include the *maintenance of management power*, or more specifically, the extent to which the maintenance of power is an end in itself, as a constraint variable. This is examined in Chapter Six.

This brings us to the second type of anti-Tayloristic policy, *worker mobilization*. Worker mobilization, or in other words, independent union action, might counteract the constraints imposed by the maintenance of management power. At the same time, worker mobilization would be a policy that bypasses the bridging variable "implementation of consensual alternatives". This is dealt with in Chapter Seven.

A second constraint variable is the *relative efficiency of Taylorist solutions* (Chapter Eight). This variable is included to take into account the possibility that the central assumption on which both enlightenment and worker mobilization rest (the assumption that departing from Taylorism nowadays necessarily boosts efficiency), is flawed. Suggestions to this effect come from a culturally pessimistic strand in social theory, that is rooted in an integral critique of contemporary society.[10] The third type of anti-Tayloristic policy, *state enforced standards*, can be seen as an independent variable that might offset the effect of the constraint variable *relative efficiency of Taylorist solutions*. This is dealt with in Chapter Nine. By imposing standards on work organization, that hit all competitors evenly, governments could push humanization of work beyond the bounds of efficiency. Like *worker mobilization*, this policy seeks to bypass the bridging variable *implementation of consensual alternatives*.

Finally, throughout the text, some attention will be paid to latent consequences or unintended side effects of the realization of the policy objective.

Box 1.3 The various types of anti-Tayloristic policies correspond to paradigmatic differences in working life research

In his penetrating analysis of the underlying assumptions in working life research, Alvesson (1987b) distinguishes three paradigms: consensus (acceptance of present-day society; humanization and efficiency go together), control (class struggle) and critique (total rejection of one-dimensional society). The consensus paradigm maps to consensus oriented policies (consensual alternatives propelled by enlightenment efforts).

The control and critique paradigms do not map to any form of anti-Tayloristic policy, therefore they are irrelevant for the present study. However, Alvesson also distinguishes two approaches that are mix-products of paradigms:

The consensus-control approach entails "explaining the problematical conditions in working life by the leaders' efforts to maintain control without acknowledging any basic conflicts between different classes" (Alvesson 1987b: 49). The consensus-control paradigm corresponds to worker mobilization-based policies.

In the consensus-critique approach, efficiency and humanization do not coincide, therefore the quality of working life must be introduced as a value in itself. To this end, state intervention is necessary. This approach maps to government enforced standards.

1.5 Data collection

The objective was to collect information on a large number of initiatives that showed at least one of the following goals:
- preventing separation of conception from execution;
- preventing further detailed division of labor;
- preventing or pushing back direct control by technical means over workers;
- counteracting the disappearance of human skills and expertise into automatic machinery and information systems;
- job enrichment;
- decentralization of responsibility;
- real participation.

(For descriptions of these goals, see Chapters One and Five.)
There was to be no restriction as to:
- the level at which the initiative took place: department, plant, company, scientific organization, region, nation, European Union;
- actors: managers or unionists, consultants, politicians,..;
- type of intervention, whether it be job redesign, software development, standards setting, or whatever.

In order to enhance empirical richness, I included countries in the study that, according to the literature, had substantial activities in the relevant area. Sources for cues for cases were the literature and expert advice. (Since a "who is who" in this field does not exist, finding out who the experts were was a research problem in itself.)

It is more likely that authors and experts who offered advice mention successful cases rather than unsuccessful cases. Therefore, one must expect that the data set is biased towards success. This, however, is not a problem. On the contrary, it is helpful because one of the research questions was to what extent the types of initiatives can be successful.

The information that I looked for pertained to real change rather than to ideological window-dressing. Most of this information came from the literature. In some instances I was fortunate enough to receive

unpublished case studies and internal company documents. In several cases I supplemented written information by interviews. This strategy provided a longitudinal aspect to the research as well. The interviews gave me an opportunity to review developments in cases that had been described earlier in the literature. Additionally, I participated as much as possible in meetings and conferences where practical experience with change efforts was shared. Where possible, I sought to enhance validity by collecting information from different sources and parties.

1.6 Data analysis

150 of the initiatives had as common characteristic that, in one way or another, they reached down to the level of the shop floor to create real changes. To process these cases, I constructed a "closed-ended coding instrument" (Yin 1984: 123), which I applied to each case. The initiatives were classified into four types of policy, corresponding to the conceptual framework: consensual alternative, enlightenment, worker mobilization or government enforced standard. For each case I recorded which of the following goals were pursued:

- preventing separation of conception from execution;
- preventing further detailed division of labor;
- preventing an increase of direct control;
- pushing back direct control;
- counteracting the disappearance of human skills and expertise into automatic machinery and information systems;
- job enrichment;
- decentralization of responsibility;
- participation.

I also recorded whether there was any success (criteria and indicators can be gleaned from Chapter Five) and whether regression to the old work organization did take place. Other items scored were obstacles to change related to power or to efficiency, or other obstacles, and whether obstacles proved fatal or not. I also recorded changes in the size of the work force. Then I sorted out all the structured and unstructured data into sets corresponding to the various variables in the conceptual framework. Thereafter I analyzed each variable, creating further subdivisions. This means that nowhere, cases are presented in their entirety: I used information from cases whenever it was appropriate for the theme at hand.

The coding instrument was implemented as a database application (developed along the lines described in Pruijt 1993). The application allows entry of qualitative information, like further description of changes

or obstacles. This made it also possible to record the unexpected (Zwanenburg 1994: 17).[11]

For qualitative analysis, I used the program Interview Streamliner (Pruijt 1991). Interview Streamliner helps researchers to turn a body of texts, e.g. interviews, into thematically organized information. The user can split the body of texts into fragments and assign an arbitrary number of key words to each fragment. One can then, using Boolean logic where desired, retrieve all fragments from all texts that meet his search criteria. This can be an iterative process. As new ideas and concepts arise, new key words can be added.

1.7 General theory

As indicated in the Introduction, there are widely divergent wholesale interpretations of the initiatives that are the focus of this study. However, most interpretations have one thing in common: they analyze the initiatives as adaptation of the organization of work to progressively changing conditions in the environment. Specifically, these changes include increased levels of formal education, increased volatility of product markets, increasingly specific demands from customers and increasing possibilities for automation of routine work. On a meta-level, we could call these interpretations modernization theory. The following theories fall into the general category of modernization theory:

a) Because of increased formal education, and because lower material needs have been met, higher psychological needs like self-actualization become more important. Making jobs less Tayloristic means adapting job design to these psychological needs, which raises intrinsic motivation and thus leads to increased productivity. Kelly (1982: 33-34) calls this the "classical theory of job redesign".

b) Volatile markets lead to shorter production runs, requiring more flexibility to reduce non-productive time. Flexible work groups are the solution. Kelly (1982: 143) asserted that: "flexible work groups may be seen as a new 'best way' of organizing work under conditions of product and/or process uncertainty."[12]

c) Streeck (1987) analyses anti-Taylorism as a strategy to attain flexibility, by extending workers' status to obtain "extrafunctional" contributions from them.

d) According to Aglietta (1979: 129), "job enrichment, leading to the formation of semi-autonomous groups" is "*the* mode of organization" corresponding to the flexible integration made possible by automation (italics mine).

The following chapters will show that the modernization theories do have explanatory power. However, several aspects of anti-Taylorism could not

adequately be explained as adaptation of the organization of work to progressively changing conditions, i.e. by modernization theories. A clue was provided by a study that was not on anti-Tayloristic developments at all, but on dockworkers "between affluence and discontent". In this book, Ter Hoeven (1969) maintained that as long is there exists a labor market, class-based action will occur. The character of this class-based action changes as workers become affluent and politically integrated, and as class struggle becomes institutionalized in the system of industrial relations. With respect to the concept of class, he notes that it has unfortunately become fixed to a 19th century perspective, and placed under taboo.

Class analysis proved a good candidate to fill the gaps left by modernization theories. Therefore, I will argue that anti-Taylorism is not only adaptation of the organization of work to progressively changing conditions, but that it is also a result of a need to find new ways to cope with the immanent, pervasive characteristics of the employment relation. No matter how modern an employment relation (in the sense of wage-labor relation) is, the following three characteristics are always there:

1) Subordination
The single most defining characteristic of the employment relation is subordination of the employee to the employer (within limits defined implicitly and explicitly by the employment contract) (cf. March and Simon 1990).

2) Asymmetry
Employers and employees have equivalent market positions only on paper. In practice, control over the means of production is a decisive difference. The employment relationship is asymmetrical (Mok 1994: 200); generally the employee is more dependent on the employer than the employer is on a particular employee.[13]

3) Employees are instrumental
Employees (i.e. "those that are being used") are instrumental in the accumulation of capital, which is, as Marx (1967: Vol. 1, Ch. 10) put it: "dead labor, which, vampire-like, lives only by sucking living labor, and lives the more, the more labor it sucks." This means that a worker, by putting much effort into his job, might help to generate profits that enable the company to make him redundant through automation or by relocating production to another country. Hyman (1984: 185) notes: "management's role as servants of accumulation means that there is a constant drive to reduce labor costs, to intensify the pressure of work, to render existing workers 'redundant'."

These three immanent characteristics of the employment relationship lead to discontent - often latent - on the part of the employees, that at

certain times in history becomes unrest. There are many factors that can explain why this unrest rarely leads to radical action:

- While there is a conflict of interest between employee and employer regarding the distribution of revenues, employer and employee also have a common interest in maintaining continuity of the production process itself (Kelly 1982: 53). Conflict is necessarily mixed with co-operation.
- Employees are largely dependent on the employment relation.
- Institutionalization of class conflict in the system of industrial relations.
- Regulations, for example on the length of the working day and social security, improve the position of the employees.
- The Fordist triangle of mass production, high wages and affordable products.
- To many, alternative economic systems are not attractive.
- Individual escape from the employment relation into self-employment is often possible (although hiring the first employee means re-entry into the employment relation from the other side).
- A self-protecting power system avoids exercise of power in such a way, that classes confront one another as identifiable groups (Habermas 1968: 53). Habermas asserts that class conflict becomes latent, and that the conflict zone moves to other areas of society.

The general result, in the view of Ter Hoeven (1969: 34), is that "protest behavior" can surface in "turnover, absenteeism, reduction of performance, withdrawal of efficiency, manipulation of wage standards, verbal expressions and other forms of striking without quitting". He emphasized that in many cases, this does not involve class consciousness, but that protest behavior flows forth from "experienced but not recognized" conditions. The implication is a "constant struggle around the workers' margin of freedom". Therefore, unease related to the employment relation is not unilaterally characteristic of workers.

It is also a cause of stress for employers. As a joke goes: "In the new year, I wish that you will have lots of employees in your business", said the businessman to his competitor.

The unease that emanates from the employment relation can take many shapes. Edwards (1990: 136) noted: "People develop policies to handle contradictions - or, to be more exact, to handle the consequences of contradictions, for people respond to felt pressures and not to the abstract nature of the mode of production." Conflict, tension or "structured antagonism" can be latent or dormant. Much has been laid down in rules and regulations, the costs of open conflict are high, a certain level of consent is needed for successful operation for the organization[14], schools to some extent prepare for the role of compliant worker (Edwards 1990).

The unease that flows forth from immanent characteristics of the employment relation is a elusive and difficult to measure phenomenon.

Stuurman (1985: 152) remarked that "vague discontent and manifest, visible expressions of conformity do not exclude one another". Giddens (1979: 148) noted that: "The aggressive banter of the shop-floor is likely to give more insight, by its form, as well as its manifest content, into how labor is experienced and understood, than any number of questionnaire responses, or even lengthy interviews." De Swaan (1972) concluded that researchers resemble personnel officers, and therefore receive the type of answers reserved for personnel officers.

To summarize, on the plane of general theory of anti-Taylorism I will argue:

1) Up to a point, modernization theories do have explanatory value.
2) The immanent characteristics of the employment relation tend to remain unnoticed - focused as we are on the novel rather than on the more permanent aspects of society. However, they continue to have an impact. This impact is dynamic. In current society, the employment relation is something we cannot live with and cannot live without; therefore, it constantly creates a need for action.

Anti-Taylorism is both a result of the need to adapt the organization of work to changes in the environment, *and* an effect of immanent, pervasive characteristics of the employment relation. It is thus a double adaptation of the organization of work: to fluctuations in the environment and to the immanent characteristics of the employment relation.

CHAPTER TWO TAYLORIST TROUBLES, ECONOMIC AND MORAL

In the post-WW II era, all along there have been managers and organization experts, who turned away from Taylorism. This chapter explores the issues that caused them to do so.

2.1 Inherent dysfunctions

Taylorism in many ways is efficient and effective. Had it not been, it would have long been eliminated by the market forces. However, there is a price to be paid for organizing in a Tayloristic way. A Tayloristic organization of work generates system losses. Since subsequent operations tend to vary in duration, a complicated division of labor causes "balancing" (ensuring that all workstations are fully loaded) problems. This increases idle time, and there is a greater chance that unfinished products must be allowed to move on. This makes it difficult to work "RFB" (Right from the Beginning) (Berggren 1989: 177-179).

Furthermore, low-trust relations introduce control costs. Thus, moving away from Taylorism should be appealing to managers who are keen to reduce labor. For example, Eckart Wintzen, CEO of the software company BSO/Origin until 1996, learned that "coordination is more expensive than letting people duplicate one another's work".[15]

As early as the 1960's, cost reduction has been one of the motives behind initiatives to change. An example from this era is an "industrial democracy" project in a Norwegian fertilizer plant that was part of the Norsk Hydro company.[16] And in the 1990's, we find a labor cost cutting company like Mercedes-Benz proclaiming "consistent delegation of decision making, wherever this is useful, to those who add value to the product" as an official company guideline.[17]

Inefficiencies concerning information processing are especially salient. In a Taylorist system, it is a logical strategy to fight increasing complexity by introducing more sophisticated and complex planning systems. Weizenbaum (1984: 31) noted that the "computer revolution" tends to prevent a real revolution because computers allow the process of bureaucratization to continue. At Felten & Guillaume (Nordenham, Germany), producer of components for electric installations and equipment (among which are spark-free motors, distribution boxes and earth leakage circuit breakers), sophisticated planning systems were tried, but to no avail.[18] In this plant, the detailed division of labor required much information processing. Supervisors had to give orders for each small step and later they had to check whether the orders had been carried out

correctly. An analysis showed that around half of the hours worked consisted of direct labor. A quarter was information processing, largely concerned with checking on the timely completion of orders.

When the variety of products increased, Felten & Guillaume experienced a disproportionally steep increase in information processing load. In addition to this, market changes led to more express orders. An industrial engineer explains:

> "For each order, the x departments that are involved need information on y items like product, material, machine, tools, coolant etc. In this way, a seemingly simple express order leads to information about x times y items. Then the planner must push the order through different departments. If he has a good relation with the foreman ("Meister"), he will succeed. But on the other hand, it might happen that the foreman is not very much inclined to do it. Then the planner has to call in the supervisor, but he can't do that too often, otherwise he loses credibility." [..]
>
> "For the office too, it is impractical that the factory is organized in departments. When Sales receives an inquiry about a certain product - about price and when it can be delivered - they need information from the planning department. The planning department in turn needs information from Production, and Production needs information from Calculation. This increases lead times. At each department the request for information lands in a basket, and there it can wind up at the bottom of the stack etc. Such a request for information means a one to three weeks lead time. With electronic data processing, and we did a lot in that area, it proved impossible to make an information flood like that manageable."

This information problem was the chief impetus behind a shift in company policy away from Taylorism.

Box 2.1 Feedback is a weakness of Taylorist planning

At connectivity products manufacturer BICC, R & D worker Andrew Ainger discovered that feedback was a bottleneck in Tayloristic planning systems. The first step in his research was to take stock of the problems of 24 plants that were part of BICC. A few underlying difficulties emerged: long lead times, frequent failure to meet agreed delivery dates and much production loss. The second step was to select four plants for further research. This research showed that the problems were related to the performance measures that were in use. One of these measures was machine utilization. Use of this measure led to over-production. Another

performance measure was the value of the products delivered over a certain period of time. This measure led to "cherry picking". This means that the parts that are easiest to manufacture get done first. As a result, the customer gets these parts too early. Manufacture of more difficult parts tended to get postponed. Thus, delivery was either too late or too early. Customer satisfaction was not measured at all. In the meantime, the market developed towards smaller batch sizes and greater variety. The engineers tended to try and bend this trend backwards, "making tomorrow look like yesterday". Following a traditional pattern, the trend was to use more technology instead of changing the organization and the deployment of workers. In the complex Tayloristic planning, feedback from the shopfloor to the planning department was a problem. Ainger carried out observations in a factory in which a group of eight planners allocated jobs to machines. The planning system produced lists of what should be done when and on which machine. Ainger proceeded to find out what happened to these lists of orders on the shopfloor. When Ainger, together with one of the workers, was going through one of these lists, the worker pointed to the job at the top of the list and said, "this job for instance goes to that machine". When Ainger asked why he chose a different machine than the one that was indicated on the list, the answer was that this machine had been scrapped two years before. The operator had mentioned this a few times to the supervisor, but the supervisor did not consider it important enough to pass the information on. As long as production proceeded smoothly, he was happy. It turned out that most of production did not proceed according to the planning department's schedule.[19]

Organizations based on detail division of labor do not have the flexibility to thrive in an unstable environment. This was already seen in the 19th century by a well known management expert:

> "Modern industry, indeed, compels society, under penalty of death, to replace the detail-worker of today, crippled by life-long repetition of one and the same trivial operation, and thus reduced to the mere fragment of a man, by the fully developed individual, fit for a variety of labors, ready to face any change of production, and to whom the different social functions he performs, are but so many modes of giving free scope to his own natural and acquired powers." (Marx 1967: 488)

More than a century later, we find for, example, Mr. Stapelmann, owner of a metalworking company[20], deliberately avoiding the introduction of a centralistic computerized planning system, because of limited technical flexibility, dependency on external suppliers, lacking standards, but

"above all because of the danger that it makes the production team less autonomous and thereby less flexible" (Lauenstein and Stapelmann 1992: 15).

Inflexibility causes Taylorist organizations to remain locked into high volume, low variety production. Companies that are moving away from this need a dramatic increase in flexibility. The Rietbergwerke in Rietberg, Germany, makers of tanks for substances like oil or fuel out of sheet steel are an example of this. Around 1980, increasing competition had put the Rietbergwerke's management in a position where they had to choose between either trying to cut costs through automation and a reduction of the workforce, or by diversifying the product range to cater for individual client wishes. The latter seemed the most attractive. It would require preservation of skilled jobs and development of knowledge at all levels of the firm. Organizational and technological flexibility would be needed. This implied that the traditional organizational structure would be unsuitable.

Increasing flexibility was an important motive for starting change. This is clearly compatible with modernization theory. But as many authors have pointed out, there are other ways to attain flexibility than by moving away from Taylorism. Huys, Sels and Van Hootegem (1995: 137), found that in the Belgian car plants, increased process control and modular product design made it possible to improve flexibility without leaving behind Taylorist principles. Using subcontractors is another possibility (Child 1985).

This brings us to the question: why did some organizations choose to gain flexibility by going the anti-Tayloristic way? One answer is already contained in the data presented above. Increasing flexibility without decentralizing responsibility leads to high information processing loads (cf. Galbraith 1976). Furthermore, decentralization of responsibility makes it possible to cut in the ranks of supervisors. But is this all?

2.2 Ethical concerns

There are managers who attach to the quality of working life a value in itself, not (only) because it is instrumental for attaining flexibility. Staco's owner wants to stimulate workers to join into discussions and in the planning process, even granting them veto rights in decisions on investments. This takes more time, but he reckons that it should make employees identify with projects and contribute ideas. Furthermore, he expects that participation will lead to an early detection of teething problems. He wants to defer the introduction of robots until technology would be so much advanced, that no meaningless residual jobs, like simply inserting workpieces in machines, remain.

The experience of Staco's present owner helped shape this anti-Tayloristic policy. In his youth, the present owner has worked on the shop floor on and off since he was fourteen years old. He recalled feeling the monotony of Taylorist work when he bended 40,000 screw hooks using a simple jig.

Christian ethics inspired Klaus Hoppmann when he initiated a process of democratization in the car retail firm that he inherited in 1957 (Opel Hoppmann, Siegen, Germany, 200 workers in 1981).[21] In The Netherlands, the management of ECT (Europe Combined Terminals - Rotterdam's largest stevedoring company) committed itself to the "formation of varied and safe jobs, with room for self-development" (Van Delden and Stel 1985: 35). One of their design principles was that "automation must lead to more attractive work":

> "The company believes that many decisions are best left to the employees who do the work, provided that they get information that is correct, timely and understandable. A computer is an important tool for this." (Bosselaar 1986: 162)

This commitment underpinned significant efforts to break out of Tayloristic patterns, especially in ECT's large container operations.[22]

From the literature, it is easy to gain the impression that ethically - driven social reform has given way to rationalization. Hart, for example, notes: "Such issues as workplace democracy, work enrichment and the humanization of work are becoming more integrated in production efficiency. Secondly, however, there is increasing acknowledgment that improvements in working conditions will become marginalized unless they are integrated with changes which have practical problem-solving functions" (Hart 1992: 5). Knights, Willmott and Collinson (1985: 3) say: "Increasingly, 'soft', high-sounding moralizing on job redesign has given way to a 'hard-nosed' pragmatism dictated by managerial perceptions of conditions in the marketplace."[23]

This seems at most partly true. Both economic motives and concerns for the quality of working life as a value in itself, played a role in "old" (1960's) cases and in more recent (1990's) cases. If we see anti-Tayloristic initiatives exclusively as adaptation to progressively changing conditions in markets and technology (modernization theory), we will have serious trouble with the interpretation of humanistic motives. We would have to accuse the managers of lying or otherwise take recourse to the unverifiable construct of false consciousness. Humanistic motives for job redesign are more easily seen as reactions to the unease that the immanent characteristics of the employment relation cause to managers. This is most clear in the case of Opel Hoppmann, in which the owner

sought to radically change one of these characteristics by neutralizing the firm's capital.

2.3 Labor market troubles

Eras of full employment reveal that few people, when given the choice, like working on assembly lines. In assembly line work, the pressure of the employment relation appears in an unmitigated form:
- discipline, relentlessly enforced by the line;
- little possibility for the worker to see himself otherwise than as some-one who is selling labor power;
- the mass of dead labor that confronts the worker is clearly present in the form of the technical structures that control the worker's movements and that develop towards further rationalization and elimination of labor.

In the 1960's for instance, when there was full employment in The Netherlands, Philips faced high turnover rates for assembly line workers. At one point, 80 per cent of the newly-hired female assembly workers left within a year (Teulings 1977: 220).

Under full employment, the quality of working life itself becomes a problem of efficiency/effectiveness. In the 1960's, Philips' management in The Netherlands faced recruitment difficulties for simple jobs. From the middle echelons, initiatives emerged to provide a solution by changing the organization of work. A committee, chaired by a deputy director of production, launched the idea of "work structuring":

> "Work needs to be organized in such a way, that workers can use their abilities soon after they start in their jobs. In the long run, the effect of work structuring must be the development of 'professions' for unskilled workers, that do justice to their abilities, ambitions and self-esteem. [..]
> Short-cycled and, for the worker meaningless, detail operations in situations where mechanization is not coming about, generally fit in ever worse with the rising individual ambitions to enjoy social recognition and matching responsibility. [..] The jobs of unskilled workers can also be extended to the organizational level, by assigning to them tasks that are not necessarily performed by indirect workers." (Bolwijn et al. 1973: 5)

A more recent definition of work structuring was:

> "While holding on to or improving productivity, organizing work, the working situation and the working environment in such a way,

that the tasks fit in as well as possible with the abilities and ambitions of the workers." (Philips 1968: 2)

A few years after its launching, the top management adopted the idea. Work structuring was not centrally planned. The ideas spread around through seminars and reports. A survey performed by the works council in 1973, showed that there were 54 projects altogether, involving 3094 workers. In 47 cases, the initiative came from the plant management, in nine cases, from workers, in nine cases from staff members and in three cases from worker representatives (some initiatives originated from more than one level) (Bolwijn et al. 1973: 9-13). Only part of these initiatives were anti-Tayloristic. Some were merely cosmetic. In Philips jargon they did not go beyond the "flower box phase". Other cases dealt with just reorganizations or with enhancing group processes. The phenomenon of work structuring disappeared as full employment disappeared in the 1970's.

In Sweden, however, full employment remained throughout the 1970's and the 1980's. The unemployment figure for 1970 was 1.5 per cent, for 1986, it was 2.7 per cent.[24] Labor turnover, absenteeism and recruitment difficulties led Volvo management to search for alternatives for the assembly line in car production. One of the outcomes was the Volvo plant in Kalmar, which started production in 1974. In this plant, a system of computer controlled carriers took the place of the mechanically paced assembly line. A contributing factor was Volvo's President P. Gyllenhammar's personal interest in the quality of working life (Gyllenhammar 1977).

An opportunity for drastic innovation presented itself in the 1980's when Volvo, for the first time since Kalmar, was ready to build a new car factory at the site of a former shipyard in Uddevalla. Again, a major consideration was the low unemployment figure (1.1% in 1990 in the Uddevalla area).[25]

The situation in which the quality of working life becomes a business problem is not uniquely restricted to conditions of full employment. Even when there is unemployment, companies can face a level of absence through illness that can make managers think about job redesign. In the late 1970's, the Dutch branch of paint producer Sigma Coatings struggled with a level of absence through illness, that was hampering production. Results were so bad that the holding company threatened to abandon production in The Netherlands altogether. A study pointed to organizational shortcomings. This study led to an anti-Tayloristic turn-around project.

2.4 Summary

When managers and organization experts have turned away from Taylorism, they have done so because of the following concerns (alone or in combination):
- the possibility of labor reduction through reduced need for control and less balancing problems;
- keeping the information processing load within limits;
- flexibility (in the sense of ability to change activities at short notice);
- ethical values (in contrast with statements in the literature; this factor remains important over time);
- recruitment and turnover;
- absence through illness.

CHAPTER THREE INSIDE CONSENSUAL ALTERNATIVES TO TAYLORISM

3.1 Introduction

Managers and organizations experts, who turned away from Taylorism, worked to create alternatives in their own organizations. These alternatives tend to be consensual in nature: the managers involved see no fundamental contradiction between, on the one hand, improving efficiency by eliminating Taylorist dysfunctions and on the other hand, humanizing work. Therefore, they see, at least in the field of the organization of work, no fundamental conflict of interest between management and workers. This idea is expressed in the literature as well:

> "The trend towards integral organization renewal offers both parties opportunities to gain. The employers get a flexible, lean organization, that can quickly react to customers' wishes. The employees get more interesting work, more opportunities for training, more responsibility and because of that, higher wages. Gain for one party does not have to mean less gain for the other. On the contrary: there are many indications that no party can gain unless there are benefits for the other." (Buitelaar 1990: 3)

In most cases, union groups subscribe to this view, sometimes playing an active role. A good example of this is Volvo Uddevalla. Initially, the plan was to set up the Uddevalla factory in accordance with the Kalmar model (i.e. with a system of computer controlled carriers instead of a mechanically-paced assembly line). Intervention from Gyllenhammar and pressure from the unions led to a more radical solution. The metal workers' union took part in the designing of the factory from the start. (This is unusual, union opinion is not often asked for before the first plans have been developed.) Six shop-stewards were members of the project group preparing the design of the factory. They played an active role in the brainstorm sessions, and not only defended the interests of union members, but also contributed their experience as car makers. The final design for the factory showed a more radical departure from the assembly line concept than the Kalmar plant did.

Of the 150 cases that make up the data base for this study, 98 belong to the category of consensual initiatives that reach down to the level of the shop floor to create an alternative organization of work. These initiatives predominantly, but by no means exclusively, pertain to assembly work, operating machinery in discrete production (not in an

automatic flow) like turning, boring and milling, and operator work in flow processes. Table 3.1 is a breakdown of the different types of work that are the foci of these cases.

Table 3.1: Types of work involved[26]

Type of work	cases
assembly work	28
operating machinery in discrete production (not in an automatic flow) like turning, boring and milling	24
operator work in flow process	18
custom production work	1
maintenance	1
goods handling	5
nursing	2
police work (officers and clerks)	1
cleaning	1
sales	3
administrative case-handling	2
clerical work in the back office	2
other clerical work	4
cooking and serving food	1
mining	4
bus driving	1

This chapter describes some of the activities involved in creating consensual alternatives.

3.2 Changing structures

Changing structures are the most tangible aspect of consensual alternatives. Breaking with Taylorism entails structural changes that transcend the level of the individual jobs. The depth of change varies, but there is a tendency towards deeper change. In 1973, the Philips works council noted that projects were too isolated. That is to say, the change projects did not touch product design and factory lay-out. An "integral approach" was lacking (Bolwijn et al. 1973: 21). Furthermore, the works council criticized the organization structure for not supporting the initiatives to change, in particular, the budgeting system, the methods of cost accounting and job rating, and "the many do's and don'ts issued by staff departments and corporate management" (Bolwijn et al. 1973: 8). The "integral approach", that - among others - the Philips works council had been clamoring for, later became *de rigueur*. In such an approach, organizations engage in several of the following activities.

1) Team formation

At DAF Trucks, the transformation involved the creation of a cell structure, covering the entire production organization. Each cell is the domain of a team, or, in case of shiftwork, two teams work in the same cell alternately.

The size of the team varies. In Component Manufacture, teams number six to ten workers. Mr. A. Coppens, a DAF organizations expert, considers this to be the ideal size. In Assembly, team sizes range from ten to twenty. This is because in Assembly, the infrastructure does not have the logical decoupling points that are required for smaller cells.

At the level of production at Van Nelle, the old organization structure consisting of two departments gave way to a team-based organization. One team receives incoming tobacco, checks its quality, mixes it and adds flavoring to it. Then they pass it on to a second team, who cut it. Three more teams handle the packing. There is a team for packing large volumes (this team is based in another plant). Then there is a team that operates packing lines for medium-sized batches. Finally, there is a team that packs special orders.

In the Halmstad County Hospital, the wards are subdivided into mini-wards. For each mini-ward, there is a team of three nurses and three assistant nurses that is responsible for seven patients. For the patients, this means that they have to deal with fewer nurses. This facilitates the development of relations of trust.

2) Defunctionalization

In a functional or synonymously, product-centered organization, each different operation to be performed on the products is, in principle, concentrated in a special department. Felten & Guillaume initiated a change from a functional organization to an island-based organization. For example, in the manufacture of metal parts, previously there were separate departments for turning, drilling/milling, punching, bar work, soldering, indexing table machines, sheet-metal working and electro-plating (Klingenberg and Kränzle 1988: 8).

At Felten & Guillaume, the island principle means that the machines that are necessary for making a particular type of product are grouped together. The workers who man these machines operate as a team. Islands are profit centers. Each production island has an island leader. Production islands have between four and ten workers. (A side effect of a shift from a workshop-based organization to production islands is that it becomes easier to transfer the manufacturing of a product to another country.)

When products require a heterogeneous set of operations, creating production islands involves moving machines to new locations. This was the case at Felten & Guillaume and the Rietbergwerke.[27]

A limitation of defunctionalization is that it can harm flexibility. At IHC, 1984 saw a cautious start with a regrouping of products. This involved the formation of production teams, each with its own array of products. This proved not practical because it was too rigid. Many products were one-offs. Furthermore, it can happen that a certain product is not being made for two years.

3) Decentralization

Several organizations decentralized secondary functions and brought these closer to production.

In addition to the production islands, Felten & Guillaume has logistical islands. These islands consist of four persons with the following functions:

- Sales management. This person is supported by a sales information system.
- Order tracking. This worker has a database with basic production data at his disposal.
- Materials planning, supported by a production information system.
- Purchasing, supported by a purchasing information system.

The four workers in a logistical island share one large desk. They coordinate their decisions in personal interaction, but not through the information systems. It was a conscious decision not to integrate the four information systems, keeping the workers in the island in control. The logistics island makes a rough planning; detail planning takes place in the production islands. The production islands only report back when they finish the job completely (Klingenberg and Kränzle 1987: 16).

In the DAF Trucks engine plant, teams keep their own supplies; there is no central warehouse.

4) Creating a specially adapted built environment

Defunctionalization and decentralization put special demands on the organization's built environment. Volvo's Uddevalla plant mainly consisted of six small factory buildings connected to a central warehouse. The design goal for the new Sigma plant in Amsterdam was to ensure that there would be no way back to a traditional organization. Four product groups - two for decorative paints, one for maritime products and one for powder coatings - constitute four factories inside the factory. Each product group has its own identical "working differently-strip" consisting

of an office, a laboratory, a canteen and a smoking room. Packaging also has its own "working differently-strip".

5) Adapting production technology

Changing the organization of work without changing technology can cause difficulties. In many factories, noise hinders communication, thereby forming an obstacle to efficient horizontal coordination and co-operation (Bolwijn 1973). A cell-based structure, a common cornerstone in anti-Tayloristic factory redesign, involves grouping different machines that are needed for making a family of products. This can increase the noise level. When AEG introduced complete assembly of power drills to replace assembly line production, noise levels increased (Klingenberg and Kränzle 1986: 29-38). Machine paced systems, like assembly lines, inhibit decentralization of responsibility, because they preclude group discussions. This a problem at Mercedes-Benz in Bremen, particularly because of the policy that the line should not be stopped. In a German micro-electronics firm (E-T-A), clean room conditions impeded the development of group structures.

In the examples above, non-compatible technology stood in the way of change. A case in which specially adapted technology did get created was Volvo Kalmar. This plant required a flexible alternative for the assembly line. This resulted in the development of a patented carrier system (Gyllenhammar 1977: 56).

6) Flattening the organization

In some cases, a reduction of the number of management layers was part of the change. An example is the SKF D3 bearing factory, which reduced the number of management layers from six to three (Hellstrand 1989: 13).

German research manager P. Binkelmann said that the flattening of an organization in Germany usually involves the level of the foremen ("Meister"). Further reduction of management layers seldom occurs. The firm's organization is something no one wants to touch.

7) Changing from production pushed by projected sales to production pulled by orders from customers

In classical mass production, the mode of production that most closely fits Taylorism, quantities of standardized products are made in the hope that the sales force will succeed in selling all the products. In an organization where production is pulled by customers' orders, nothing is produced unless there is an order for it. Many production chains are in effect a mix of both modes, with pushing going on at the beginning of the chain and

pulling taking place near the end. In some cases, organizations shifted their approach from production pushed by projected sales to production pulled by orders from customers.

Before the change, workers at Staco produced anonymous grids in standard dimensions. Other workers would then cut these grids to the exact dimensions that customers needed. This required intermediate storage and led to wear on saw-blades and to waste. Staco changed this around completely and integrated jobs. Now workers produce grids for specific customers in the correct sizes right from the beginning. Lauenstein and Stapelmann write that this was a much more difficult way than, using new technology, optimizing the Taylorist way of working. Nonetheless, according to all concerned, the goals were met, including providing scope for job enlargement and decision-making by workers (Lauenstein and Stapelmann 1992: 15, 75-80).

8) Introducing specially adapted information systems

Information systems often reflect the organizational structure to such an extent, that they become obstacles to change. This prompted several organizations to include information systems among the targets for change.

In German life insurance company Aachener & Münchener Lebensversicherung, teams take care of all the business of all clients in a certain geographical area. To make the change more feasible, programmers created an overarching interface for the various applications and put the supporting handbooks on-line (Müller, Münster and Nocker 1990).

In a German steel factory sales, calculation, work preparation and quality assurance were integrated into teams. The project involved the creation of software to integrate the applications for sales, calculation, work preparation and quality assurance (Thienel, Richter and Zimmerman 1990). At Sigma coatings, the new information systems reflect the decentralized structure based on product groups.

The value of specially adapted information systems is underlined by the experience gained in cases where these systems were not available. At ECT for instance, information systems that gave one-to-one instructions were hampering efforts to move towards more autonomy (Bouwman, Van Halem and Van Klaveren 1989: 14-15).

9) Introducing pay systems that are compatible with a flexible organization

Pay systems that are geared to Tayloristic organization tend not to reward but rather punish flexibility. They penalize the learning time that workers need when they switch to other tasks. A case in point is the German

clothing industry (Gebbert 1991: 86). A remedy is to develop alternative pay schemes. One of these is a system of pay supplements for learning new operations that is in use at the Willy Bogner clothing firm in Germany (Paß 1991, Gebbert 1991).

10) Formation of business units

A drive to increase responsibility does not have to limit itself to workers' jobs, it can include managers' jobs as well. The formation of business units is a strategy to decentralize business responsibilities.

The first step in the change process at the tobacco branch of Van Nelle in Rotterdam, a success story of Dutch sociotechnical systems design (Van Amelsfoort 1992: 64-74, Kuipers and Van Amelsfoort 1990: 129-132, Joosse et al. 1990, Pot et al. 1989: 199-204), was to turn the tobacco branch into an "operational group", responsible for buying raw materials, production and sales and having its own technical department.

At IHC, 1987 saw the formation of business units. These units can try selling products on the external market. For example, one of the units operates an automated welding line for hull panels. This unit started selling panels to other shipyards.

11) A new orientation towards the market

Getting out of mass markets can be part of the set of strategies involving a departure from Taylorism. A good example is the Rietbergwerke, that geared production more closely to customers' specifications and entered the market for environmental protection technology.

3.3 Changing attitudes

Responsible autonomy[28] requires more worker commitment than direct control. In several cases, a proportion of the workers did not show a level of commitment that commensurated with responsible autonomy. The active union members that I spoke with in the Volvo Uddevalla plant (a car builder and a warehouse worker) emphasized that Volvo Uddevalla should not be regarded as an ideal factory. A major problem, as they saw, was the lack of commitment on the part of many employees; a new way of working, such as that at the Uddevalla factory, could only succeed if all employees were interested in the work. This was a point of serious concern. In their opinion, the lack of commitment jeopardized the success of the factory.

Furthermore, the atmosphere in some of the teams was bad. People could ask to be transferred from one team to another, but evidently, this

presented no real solution to the problem of poor relations within the teams.

It is an almost typical experience that part of the workers do not show commitment. "If you would interview people now, you would probably hear: 'it is all shit'", says an industrial engineer at Felten & Guillaume, "This happened in a TV program, leading to all sorts of questions. Partly they have not known the old workshop-based organization, partly they take the present organization for granted." A unit manager at Van Nelle notes: "There must clearly be more discipline, I must lay down a guideline. For example, it happened that they went home at half past nine, while there was still a pile of work. That would have had to be ten a clock."

At ECT, researchers assessed whether workers were interested in job enlargement and job enrichment. Half or more of the operational workers wished to have some of these activities added to their jobs, in order of popularity: cleaning equipment, safety, scheduling vacations and days off, organizing training, manning and allocation of work, environmental protection and scheduling manning of equipment. 38 per cent were interested in recording data, 36 percent in administrative work, 32 per cent in processing and analyzing data, 33 per cent in dealing with malfunctions, 31 per cent in light repairs, 29 per cent in preventive maintenance. There were employees who were interested in organizing tasks, but they were not the majority (Bouwman, Van Halem and Van Klaveren 1989).

At Holec, worker commitment to teamwork fluctuates. When it goes down, it results in increased lead times, in losses through manufacturing wrong products, waste of material, poor quality and low productivity.

Language skills (in the vernacular) are an important requirement for efficient socialization into teamworking. A manager at Van Nelle explains:

> "There is good cooperation in the workteam for special products, which does manual work. In other teams, it can happen that when you just pick someone, that he does not even know that he is part of a workteam. With some foreigners, it is difficult to discuss abstract things because of language problems. Workteams may not be abstract, but nonetheless more abstract than 'put the lid on that thing'."

At Holec, several migrant workers do not speak Dutch. There were language courses, but not everyone was interested.

There is no shortage of possible explanation why employees - in significant proportions - do not wholeheartedly embrace anti-Tayloristic change projects:

1) The new job content can be too demanding.[29] At Holec in The Netherlands, this was initially the case for several workers with good technical skills, who ran into difficulties when they had to perform organizing duties.

2) Task integration often entails inclusion of less desirable tasks in jobs.

3) "Instrumentalism", i.e. the attitude that work content is not important, that work is no more than a means to an end. In some cases, this has been part of the management experience. In the Rietbergwerke, one of the explanations advanced for the lack of interest in training is that workers are rurally molded ("ländlich geprägt"). At home, many of these workers are involved in agriculture or livestock breeding. "Some of the workers do not want more interesting work at all", says a manager at Van Nelle "They do what they have to do. Then they get their coffee, they go on working, have lunch, get coffee and go home. They find it important to be able to talk while working."

4) Through anti-Tayloristic change, jobs acquire characteristics of higher-paid jobs. Employees can be expected to want pay raises in return, which in fact has often happened. When satisfactory pay raises are not forthcoming, wage-effort bargaining might ensue. Huiskamp (1991: 13) mentions a case of a factory where, after the introduction of semi-autonomous groups, effort bargaining took place. In some sectors there is a tradition of game-like effort bargaining. An example is mixed or general cargo stevedoring (Smit 1992). But in organizations where no explicit wage-effort bargaining takes place, employees can still withhold commitment when they are not financially satisfied.

5) Anti-Tayloristic developments can threaten the ways in which, in the words of Watson (1987: 223) "people adjust to the variety of ways in which they are made use of in the employment situation". A change from line assembly to complete assembly in individual workstations can minimize the possibility for non-work related conversation. When a redesigned job requires constant attention, possibilities for daydreaming and conversation become less.

Shop-floor culture may be an area where some self-expression takes place. According to Willis (1979: 188-189) "working class culture of work is not simply a foam padding, a rubber layer between humans and unpleasantness. It is an appropriation in its own right, an exercise of skill, a motion, an activity applied towards an end". Elements of shop-floor culture are a "half-mythical primitive confrontation with the task" (Willis 1979:190) and a sense of competence involving the superiority of practice

over theory. The social group is the basis. Apart from sexist attitudes, jokes are important:

> "It is the area precisely of irony and the joke where the controls downwards from supervisors can be partially blunted by joking. [..] The shop floor with its 'piss-takes', 'wind-ups', and jokes inserts the young worker into something of an artificial reality: denying the strict logic of a capitalist productive disposition of real bodies in the labor process; denying a direct control of the individual body. This supports practically the possibility of alternatives: and that the abstract logics of control need not always be followed. The cultural apprenticeship is an important ground for the practical, often unpleasant learning of the range of the ways of being related to work, of handling external direction, of understanding the invisible bargains over how work is shared out and finally limited through informal control. It is one of the concrete modes of opposing the 'political technology' of the factory with its rule book, interdicted areas, and the pace of the machine. Of course, and this is crucial, all this is experienced culturally, as a living out, not as a political opposition to the logics of capital." (Willis and Corrigan 1983: 96)

A small gain in work interest as a result of job redesign might not compensate for the associated loss of self-expression through shop floor culture.

De-bureaucratization paradoxically can mean a loss of autonomy at the bottom of the organization. Following Crozier, Giddens (1981: 311) concluded that "it is plausible to argue that the more tightly knit and inflexible the formal relations of authority in an organization, the more they can be circumvented and manipulated by those in subordinate positions to their own advantage".

In order to effectively perform any job, an employee must do at least a little more than just follow the rules (cf. Edwards 1990: 140-141). If employees are, at the outset of anti-Tayloristic change, unwilling to put at least some creativity into their work, we can read this as resistance to the employment relation in general. Gorz (1980: 45) describes this kind of resistance as "active passivity".

6) It may be that job redesign in general benefits management more than employees. Some writers on organizations have come to this conclusion. In a handbook on organization, Child (1988: 46-47) writes (following Kelly 1982):

"[..] the needs and interests of workers which are involved in job redesign are not confined to 'psychological' aspects such as job satisfaction or personal fulfillment. They also extend to economic issues such as an acceptable intensity of effort, job security and levels of pay. In our present social and economic system, most employees will of necessity if not of preference, give highest priority to these requirements being met. Since keeping effort down, security and pay are at the sharp edge of conflict with management (which will perceive the same issues in the opposite terms of raising effort, treating labor as far as possible as a variable not a fixed resource, and keeping wage costs down), then it is appropriate to examine how the introduction of job redesign has affected this balance of interests. The conclusion is that it has generally benefited management far more than workers."

It seems reasonable to assume that employees themselves might come to similar assessments (cf. Elshof and Wetzel 1992).

7) Insofar as the change project involves participation, employees may fear that their knowledge is appropriated by management, thereby weakening the position of the employees.

Thus, making people fit into the new structure is a major management problem in consensual alternatives. Two basic strategies to deal with the problem of worker commitment are evident. Both strategies in some way violate the idea of decentralization of responsibility.

One strategy relies on rewards to stimulate compliance with the new system. In the Halmstad County Hospital one finds informal rewards in free time. One of the head nurses faced the problem that particularly older workers were not interested in the change:

"At first, I invested a lot of energy in people who did not want to change, later I concentrated on the people who did want to change. For example, as a reward they would get a few hours off. The other saw this and thought 'that's interesting' Now there are only two older nurses left who do not want to participate."

Furthermore, there are specially designed pay systems for encouraging learning. In the Volvo Uddevalla plant, the larger the proportion of a car that an employee mastered, the higher the pay. However, this only applied up to a certain degree. Consequently, learning to assemble an entire car was not encouraged financially. In the new factory of Sigma Coatings, pay is based on knowledge rather than performance. At IHC, every course out

of the training program, that is successfully completed, leads to a pay supplement.

Time and again, the idea of group bonus systems in the form of additional wage comes up; but it is generally unpopular. Works councils fear that teams will push out weaker workers. In some cases (Holec, Van Nelle), teams receive bonuses that they must use collectively. At Van Nelle, one team decided to use their bonus for buying ventilators, another team decided to spend it on a stereo system for their department. However, a Holec manager experienced: "Something like this works only for a short time. The renewal must come from inside." At IHC, there is no group bonus for performance: "We still assume that everyone does his best. After a terrific performance there is cake for the entire production personnel."

The second type of strategy uses direct control. "We used gentle pressure to move them to get training", says G. Hedemann of Felten & Guillaume "After the training, they did not find it a problem. As an argument we told them that their jobs would be more secure if they would participate. We told someone, who was only engaged in boring, that there might be less boring to do in the future, or that there might only be punching, and that it would make his job more secure if he would be able to mill and turn. But some resistance remained, some people did not want to participate at all."

At Sigma coatings, potentially less popular jobs like filling are part of the rotation schemes. In case of unwillingness, some pressure is applied. When hiring new personnel, willingness to rotate is a requirement. For example, no one can be hired who wants to work only in the laboratory.[30]

In 1994, ECT tried to achieve a breakthrough in the area of job rotation. (Earlier attempts had been unsuccessful.). The new Delta 2 terminal runs on an experimental basis under a job rotation scheme. All workers on the Delta 2 terminal have chosen to work in this place, knowing that there would be job rotation. Job rotation is mandatory, but Willem Galama, ECT's in-house organizational expert, says that management seldom has to intervene. Workers consider job rotation a right rather than a duty. One reason for job rotation is to reduce physical strain. The job structure on the new terminal has four levels. On the lowest level, workers have two jobs, on the second level three jobs, on the third level four jobs and on the fourth level, five jobs, including the coordination role. The idea is that everyone tries to get to the highest level, taking all his jobs with him. The carrot in this scheme is that participation in rotation is a precondition for moving up one level.

3.4 Social movement aspects

On a deeper level, consensual alternatives exhibit aspects of social movements. To a varying extent, there is unmanaged and open-ended collective action, directed towards change. This involves a mobilization process, not just of workers but at all levels in the organization. It includes bottom-up mobilization activity - a process completely different from change program implementation by management.

Bader (1991: 362-363) and others pointed out that it is possible to see social movements as collective learning processes. Indeed, in consensual alternatives, one finds intensive and collective learning. This does not only include learning how to achieve certain goals, but also setting and redefining goals. In the literature on organizational learning, this is often referred to as "multi-loop learning" (Ramondt 1996: 119).[31] Multi-loop learning is seen as the highest stage of organizational learning. The lowest stage is single-loop learning. Single-loop learning is based on detecting and correcting deviations from pre-given operating norms. The next stage, double-loop learning is an extension of single-loop learning: it involves taking a "double look at the situation by questioning the relevance of operating norms" (Morgan 1986: 88). The highest stage is multi-loop learning. It involves reflection on the context for learning (Ramondt 1996: 120).

There is a pro-active consciousness, a sense of history making, of making a difference. Actors seek to acquire freedom to maneuver. Subgroups are expected to develop their capacities for self-organization; debate and involvement rather than compliant apathy are the norm. Emancipation goes on as part of the process.

Finally, there is a strong element of voluntariness. Although all participants are paid for their work, their commitment extends far beyond the call of duty. Since taking control of the organization of work is a central feature, these social movement-like processes are in conflict with the general characteristics of the employment relation.

As said, the strength of this dimension varies. A case in which all elements of the social movement aspect are present is the Halmstad County Hospital (Sweden), in which grassroots mobilization led to an effective organization redesign process. Traditional Tayloristic principles had shaped the organization of work in the County Hospital of Halmstad for decades. Normally, one person did the same thing for all the patients in a ward. Furthermore, there was a deep division of labor between assistant nurses and regular nurses. Assistant nurses made beds, washed patients and served meals. Regular nurses restricted themselves to the more medical tasks. Taking blood samples, letting patients take baths and internal transportation of patients were separate jobs. Although nurses were qualified, their autonomy was limited because they could not do

much without the consent of the head nurse. Looking back at this period, a head nurse remarks:

> "I was the main person, the central figure. I 'knew everything', everybody had to talk to me about the patients, I gave all the orders as to what they should do."

The head nurse was the only person who was in contact with the doctors. Thus, one person was responsible for all the patients in a ward seven days a week, 24 hours a day.

When we look for the impetus to change, we find that it did not originate from higher management, i.e. above the level of the head nurse and the department doctor. The shortcomings of the ossified organization structures were most acute at the ward level. This held certainly true for workers who knew from their own experience that the organization of work could be different and more effective. One of these workers was Eva Jönsson. After nursing school, she started her career in an intensive care unit. Intensive care units tend to be characterized by teamwork. Every nurse is responsible for his or her "own" patients. Later, Eva Jönsson became one of the head nurses at the clinic for Internal Medicine. There she found that nothing had changed since her days in the nursing school.

Under the right circumstances, discontent at the shop floor level can lead to innovation. In this case, the catalyst was a crisis, in which working stress ran unacceptably high. Several of the nurses wanted to quit, saying that they would take jobs anywhere except in health care. Eva Jönsson discussed the crisis with Bengt-Göran Hansson, the department doctor, and together they came up with the idea to introduce teamwork. The staff's reaction was "let's do it, it can't be worse". They organized meetings in which all who worked in the ward, from cleaning person to doctor, discussed the manner of working and the organization. There were 13 meetings of three hours; all held after working hours. The reason for having the meetings after working hours was to enable everybody to participate, except the two or three nurses that had to stay in the ward. Training officers participated in the meetings as well.

The solution that emerged was to subdivide the ward into two parts, each part having 14 beds. In each part, a fixed team would work. This new organization required having an extra part-time nurse in the ward. The possibility for obtaining money for this depended on a political decision. In Sweden, local politics has a substantial influence on hospital management, because local taxes provide the funding for the hospitals. The innovators managed to influence the county council's decision in their favor. At the same time, the training department of the hospital exerted political influence. They felt that it would be a good idea to give all nurses

management training. They made this suggestion to politicians, who decided accordingly.

Giving management training to persons who are not managers is, regardless of the content, a somewhat subversive activity. A doctor described the effect as follows:

> "We send nice nurses [to the course], and we get troublesome nurses in return."

Plans for a new building offered chances for a more radical application of the team concept. A nurse, who had been a hospital manager in charge of nursing, was responsible for investigating the organizational aspects of the new building project. The organization of work was part of this. Local politicians encouraged her to look into possible alternative ways of organizing. In Denmark and Norway, she found a system of "primary nursing" that had been adapted from the U.S. In the primary nursing system, every patient gets assigned a primary nurse with whom he or she has the most intensive contact. Primary nursing, however, was not an employable concept because it involves only regular nurses. This would have been unacceptable to the assistant nurses' union. For this reason she tried to avoid the term "primary nursing" as much as possible. Instead, she coined the term "deeper teamwork". This concept involves assistant nurses and regular nurses in equal numbers.

From this point onwards, redesign activities built on the experience accumulated in Eva Jönsson's ward; the ward that had already been split up in 1980. One of the shortcomings in this ward was that the teams were too large, causing an ever-present danger of a relapse into the old pattern. Therefore, they were eager to reduce team size, but they would need additional staff for this. This experience provided a strong argument for basing the design of the new organization on smaller teams. A nation-wide study by SPRI (Planning- and Rationalization Institute) helped set the scene for a change in the organization of work. That is, their study concluded that it would be preferable to have smaller teams and to employ more nurses. This prompted politicians to put alternative hospital organization on the political agenda.

In the hospital, a wide debate followed. From a hospital in Stockholm, where one ward worked with the primary nursing system, came a delegation consisting of a doctor, a head nurse, a nurse and an assistant nurse to share their experiences.

The innovatory coalition grew stronger by the day. To this testifies the fact that Eva Jönsson and Bengt-Göran Hansson rose to the ranks of management respectively as nursing manager and as chief doctor.

Finally, a political decision made the new working organization the norm for the entire hospital. Eva Jönsson played an important role in

stimulating the head nurses, who were to implement the changes. A head nurse commented:

> "To get such an organization like we have, you need a person like Eva Jönsson and you need ward nurses that got education, and of course, believe that it is possible to work like this."

Another head nurse commented that:

> "It is because of Eva Jönsson that we are what we are."

The change process required a commitment from the head nurses, that was way beyond the ordinary. A head nurse noted:

> "To be able to do this, you must be idealistic, you must be there at all times and you must motivate people. For six years, the change cost me my spare time, Saturdays and Sundays. Now it works well and I don't have to be around constantly."

Often, the communication structures are not conducive to social movement-like developments. A Swedish change project in a police organization aimed to enhance representative co-determination through the unions with direct influence by individuals in their own work groups. However, an evaluation study showed no increase in employee influence. The study concludes that there was no demand for influence because there was no room for discussion (Naschold 1992b Anhang C: 92-107).

The remnants of old power structures can slow down a process of change. At the beginning of the change process in the County Hospital in Halmstad, one of the head nurses faced old problems that had accumulated over a period of twenty years. Under the regime of the old head nurse, who had worked there for twenty years, there had never been a real discussion.

On a different level, a sociologist working in a Mercedes-Benz car plant as a teamwork consultant cannot approach plant management directly. What he wants to say has to pass through several management layers to reach the top. In order to get in touch with plant management, he has to resort to the trick of organizing a workshop. Moreover, at his level, there are no contacts between the various Mercedes-Benz plants that are all presumably trying to move in the same direction.

3.5 Summary and conclusions

Increasingly, consensual alternatives involve more wide ranging change than just job redesign. On the level of structure, the following types of changes could be identified:

- team formation;
- defunctionalization;
- decentralization;
- creating a specially adapted built environment;
- adapting production technology;
- flattening the organization;
- changing from production pushed by projected sales to production pulled by orders from customers;
- introducing specially adapted information systems;
- introducing pay systems that are compatible with a flexible organization;
- formation of business units;
- a new orientation towards the market.

In the area of workers' attitudes, there were widespread difficulties to be dealt with. As a rule, it seems safe to assume that around half of the workforce do not wholeheartedly support anti-Tayloristic change. Top-down management strategies to change workers' attitudes to adapt them to the new structures entail rewards and direct control.

In addition to the (re)design process of structures, and efforts to manage workers' attitudes, consensual alternatives exhibit spontaneous processes that are reminiscent of social movements. Among these are collective learning processes.

In fully developed consensual alternatives, the design of structures, top-down policies to change the attitudes of employees and the social movement-like process constitute a trinity.

CHAPTER FOUR - ENLIGHTENMENT, SHOWING MANAGERS THE WAY

4.1 Introduction

This chapter deals with policies originating from outside the organizations to be changed, designed to promote and support the implementation of consensual alternatives. These policies are directed toward modernization, but at the same time they are also a continuation of a long line of policies to protect employees from damaging aspects of the employment relation (like policies to limit the length of the working day, to stamp out child labor, to limit unhealthy working conditions).

The basic assumption underlying these policies is that there is an inextricable link between, on the one hand, efficiency, and on the other hand, humanization of work (i.e. breaking with Taylorism). This implies that real opportunities exist for interventions to promote a shift away from Taylorism. That the world has not yet witnessed a breakthrough in humanized work is explained by failure of managers to see the advantage in this[32], or ignorance about the possibilities for change. Given the ignorance and backwardness of managers, there is room for enlightenment efforts. Indeed, one can find a range of activities designed to promote, support and enhance local activity in consensual alternatives. These enlightenment activities are the business of researchers, who, while combining consultancy and research, accumulate expertise on changing working life and offer to feed this back into organizations.

In several countries, politicians have initiated working life policies that aim to enlighten managers. Especially in Scandinavia and in Germany, there are consensus-oriented research and development programs that are pursuing alternatives to Taylorism. In these programs, government agencies and research institutes work together with companies to create consensual alternatives. Finally, there are engineers who try to develop technology without a Taylorist bias.

Box 4.1 Main enlightenment Research & Development programs dealt with in this study

Norway: Industrial Democracy Project 1962-(approx.)1975 Sweden: Development Program 1982-1987, LOM (Leadership, Organization, Co-determination) Program 1985-1990, MDA (People, Data, Working Life) Program 1987-1992 Germany: Humanization of Working Life 1974-1989, Work and Technology 1989-

In this chapter, I will do the following, and in the following order:

1) Introduce the activities of the consultant-researchers who engage themselves directly in change processes in organizations, and highlight examples of interventions in organizations. I shall begin with the activities of the consultant-researchers because they are closest to the change processes in organizations.

2) Then I shall go into different strategies to increase the diffusion of successful models.

3) The development of anti-Tayloristic technology is another, totally different but also indirect way of stimulating change. I collected information on anti-Tayloristic technology projects and tried to establish whether they contributed to actual change at the shop floor level.

4) As a supportive policy, sometimes subsidies are given to organizations who engage in change projects. The question is: are subsidies an effective catalyst for change?

5) Finally, I shall move to the level of politics, where we find large differences between nations. Some countries have stable, long-term enlightenment policies, while others have not.

4.2 Scientific support, the business of consultant-researchers

Scientific support is the mainstay in the enlightenment efforts. It is a dialectical combination of research and intervention. The school (or better, schools) of sociotechnical systems design offers the most visible body of general theory in this area. The sociotechnical paradigm in organizational and management studies, at the origin of which were the Tavistock studies, had a number of anti-Tayloristic characteristics:

- Emphasis on self-regulation in semi-autonomous teams (responsible autonomy).
- Organizational design according to the principle of redundancy of functions instead of redundancy of parts. These are two different ways for organizations to deal with a changing environment. Redundancy of parts involves setting up new, special departments or new, specialized jobs, while redundancy of functions means that workers acquire additional skills and competence to deal with new demands.
- The possibility for workers to decide in their jobs ("control capacity") is important.
- People are not seen as extensions of machines (Trist 1981: 22-23).

Box 4.2 The sociotechnical tradition started by learning from discoveries made by workers and managers

In the U.K.'s coal industry, the introduction of conveyer belts and coal cutters had entailed a further division of labor and a deepening of the separation of conception from execution. Along with the mechanization there had developed a standard way of working, the "longwall method of coal getting". In this method, the coal face is 160 to 180 meters long. Coal-getting takes place in cycles of 24 hours, employing 40 miners. The cycle comprises seven consecutive steps. For each step, there is a separate job. This division of labor deprived the majority of the miners from the possibility of performing a whole, complete task. This limited the satisfaction that they could get from their work.

The fact that the steps were interdependent and the cycle was rigid, created more problems. If one step was not completed 100% successfully, the entire process would be disturbed. For their incomes and their working conditions, the miners were dependent on the quality of the work performed in the preceding step. This led to tensions in miner's communities. This situation differed sharply from the way of working prior to mechanization. Then it was customary for small (between two and eight miners), relatively autonomous teams to do all the underground tasks in coal-getting. Coordination and supervision were part of the work; between management and team there was a contract relation (Bamforth and Trist 1951). With the introduction of the longwall method, coordination disappeared from the circle of miners who did the actual work of coal-getting (Trist et al. 1963: 62).

Researcher Ken Bamforth of the Tavistock Institute for Human Relations, who had worked as a miner at the coal face for 18 years, had the opportunity to do a study in the same mine where he had worked before. There he discovered an alternative organization of work that was based on semi-autonomous teams that took care of the entire cycle and rotated jobs among themselves (Van Eijnatten 1991: 8-9). The technical concept came from the Area Technical Manager. Miners had, with union support, proposed the organization of work. They drew their inspiration from the organization in pre-mechanized times. Researchers found strong personal commitment, high productivity, low absenteeism and a low accident rate. They concluded that the miners had found a way "of recovering the group cohesion that they had lost and of advancing their power to participate in decisions concerning their work arrangements" (Trist 1981: 22).

The Tavistock researchers did not restrict themselves to value-free description, but wished to contribute to the diffusion of the innovations that they were investigating. They analyzed the conventional longwall method as a "technological system expressive of the prevailing outlook of mass-production engineering" (Bamforth and Trist 1951: 5) and the development of the "composite" system as an organizational choice that

ran counter to the dominant way of designing organizations along Tayloristic and bureaucratic principles (Trist 1981: 22).

The local managers and the local trade unionists agreed to the plan to study the innovation with a view of diffusion to other pits. The Area General Manager, who was in charge of twenty pits, supported this (Trist 81: 21-22). However, a higher management echelon, the Divisional Board, vetoed the plan. According to Eric Trist (1981: 27) these managers were afraid that granting autonomy to miners would lead to a power shift. They wanted stronger management control to speed up mechanization.

Subsequently, Tavistock researchers carried out various projects in U.K. mines. In one of these mines, they discovered a local experiment with new technology in which semi-autonomous teams of 20-25 men performed the whole cycle. All men participated in all operations. They were all multi-skilled and earned the same wage. Productivity and work satisfaction were good. The local manager wanted six other pits to switch to the new system, and researchers from Tavistock would provide scientific support. The plan was to set up a conference for managers and an Area Training School for miners who would go over to the new system. However, a new division manager canceled the project.

Trist mentions three causes for the demise of the project:

- The project was seen a purely technical one that did not happen to fit in with plans for further mechanization. The manager did not acknowledge that organizational renewal had a value of its own.
- Granting autonomy to miners was not popular.
- On the regional level, the union had won a wage increase for the operators of new equipment, which destroyed the unity within the teams.

Before two years had passed, everything was as it had been before.

The National Coal Board did not show interest in the research results that proved the productivity edge of semi-autonomous teams (Trist 1981: 28-30). Trist (1981: 28) came to the conclusion that the effect of the mining studies on industrial practice was negligible.

Subsequently, researchers expanded the paradigm by embracing concepts that they predominantly derived from systems theory.[33]

A second line of expansion was a shift away from a nearly exclusive concentration on job design at the level of the shop floor to the organization at large, including its relations with the outside world. This is the "integral approach" that the Philips works council had called for in its 1973 evaluation of the work structuring projects. A short summary of the goal of integral design is: "complex jobs in a simple organization instead of simple jobs in a complex organization" (Hasken, Den Hertog and Verschuur 1990). The integralization of sociotechnical systems design reached a peak in The Netherlands. Dutch researchers, following Sociologist De Sitter, dissociated themselves from "classical" or

"traditional" sociotechnical design and sought to establish a science of integral design (De Sitter 1981: 234). This implies a joint optimization of all aspects of management. The researchers reject "partial design" in which, for example, automation is the province of the Information Systems department and quality of working life is the area of the personnel department.

A third line of expansion of the paradigm is a bifurcation that developed between more participative approaches (in Scandinavia) and more expert oriented approaches (in The Netherlands).[34] A major point of divergence between the Scandinavian and the Dutch approaches is that the Dutch approach exclusively plays the card of modernization. It has three main (re)design objectives: flexibility, controllability and quality of work (De Sitter in Van Eijnatten 1993: 143). However, it defines quality of work in terms of "control capacity", i.e. "structural possibilities to cope effectively with variance" (Van Eijnatten 1993: 179). Thus, quality of work is an instrumental concept directed at adjusting the level of flexibility to business requirements. Theoretically, this means that an assembly line based factory could be a sound sociotechnical design, provided that there are no large fluctuations in its environment. The Dutch approach has no built-in drive to find ways to cope with the immanent characteristics of the employment relation.

This is different in the Scandinavian approach. For Gustavsen (1992: 74), a theoretical figurehead of the Scandinavian approach, the employment relation as such is an important problem:

> "Basically, any enterprise organization, however 'flat', is a steering system. It can be much else, but it is always more or less of a steering system. It consequently always raises the problem of how to unify a steering system with human motivation: How to combine a system which, at least in certain respects, 'tells people what to do' with a high motivation to do it? This is an eternal dilemma." (Gustavsen 1992: 74)

A Scandinavian way to cope with this dilemma is to pursue a "dialogue-based development strategy".

Box 4.3 Sociotechnical theory can be a source of inspiration

At DAF Trucks in The Netherlands, cost cutting was an important driving force for moving away from Taylorism. In the early eighties, initiatives such as department meetings, quality circles, job rotation, job enlargement and multi-skilling emerged. The firm had a special staff department "Quality of working life and of the organization" comprising four people.

In 1983-1984, the market collapsed. This situation asked for investment in new technology and in the development of new products. But, being financially unable to do both, management chose to invest in new products; so DAF would generally have to make the most out of the existing technology. As a way to cut costs, top management contemplated discontinuing the production of a number of components and to buy these instead.

Jacques Huberts was Head of the Personnel Department for the components plant which would be threatened by such a scheme. Inspired by writings on sociotechnical systems design by U. de Sitter and J. in 't Veld, he, together with the head of Development, wrote a paper in which they proposed organizing the plant along sociotechnical lines. In their opinion, the quality of working life had to be the overarching goal. The top management reacted with a statement like "if you think you know what should be done, you might as well do it yourself" and appointed him as a plant manager. This was not a risky decision, because if the proposed changes should fail, they had least a plant manager from the social sector in place to close the plant down gracefully. However, a change process got under way and gained momentum. Contacts developed with sociotechnically-oriented researchers and graduate students from the Catholic University of Nijmegen.

Subsequently, the new way of organizing spread throughout the company.

In Germany, researchers developed and successfully applied a body of theory, that has no basis in sociotechnical systems design theory. The extensive publications from the Humanization of Working Life program demonstrate this, because they hardly make any reference to the sociotechnical literature. Furthermore, in the self-image of sociotechnical systems design, as captured in the review by Van Eijnatten, German research plays no role. In a list of 180 institutes and companies, it does not mention any of the German research institutes, and only one German company (Siemens).[35]

One possible explanation might be that in the shaping of the theories, factors other than the requirements of effective intervention against Taylorism play a part. According to Emery (1993: 192-193), one of the founding fathers of sociotechnical systems design, it was subject to:

a) Scholastization for the sake of academic respectability, for which the production of learned papers is more important than reality testing.
b) Consultants' interest in client dependency.
c) Political accommodation.

On the level of practical organizational design, end results in The Netherlands, Germany and Sweden were not radically different. One principle that the Dutch Integral Sociotechnical Design most heavily stresses, parallelization of order flows, was practiced in all three countries.

4.2.1 Interventions

How productive is scientific support in terms of causing or promoting social change? In this section, I shall describe the various types of contributions that researchers made to the cases of consensual alternatives in my dataset. These are: diagnosing the failure of Taylorism to provide both efficiency and an acceptable quality of working life, aiding in the design of the production structure, accounting and wage systems and qualification programs, consultancy and monitoring performing evaluations, providing training to management and influencing management views to make these more radical.

Diagnosing the failure of Taylorism to provide both efficiency and an acceptable quality of working life

In a few cases, studies that pointed to Taylorism-related flaws in the organization were instrumental in a process of change. Examples are a 1981 study by CCOZ into the causes of absence through illness at Sigma Coatings and a study by a team of the Free University of Amsterdam for the works council at ECT (container terminals) (Van Delden and Stel 1985: 37).

Box 4.4 Researcher involvement at ECT

In the late 1970's, criticism against the level of worker autonomy emerged. A publication by the General Action Committee of the Rotterdam Dockworkers on the occasion of the port strike of 1979, states: "The tasks are fixed, the freedom to make decisions independently is minimal. Whatever you do depends on what the computer tells you to do."(Gezamenlijk Aktiekomité van Rotterdamse Havenarbeiders 1979: 20). A former truck driver, who works at ECT, notes: "When I get into my car after work, I have already forgotten the whole business. With my former employer it was not like that. There, unlike with ECT, one had certain responsibilities. At ECT I see myself more as a number."(Gezamenlijk Aktiekomité van Rotterdamse Havenarbeiders 1979: 20). The quality of working life showed up on the firm's political agenda in 1981, when the works council received a request for advice on the social plan for a new terminal, the Delta 1 terminal. By then, the planning process for this new terminal was already in its seventh year. To be able to offer a well-founded judgment, the works council wanted to know well the experiences and opinions of the workforce. Therefore, they drafted, in collaboration with the unions, a proposal for a survey. Researchers from the Free University of Amsterdam did this survey, in which 600 workers

participated. The researchers found shortcomings in the function structure, the working environment and in communications (Van Delden and Stel 1985: 37).

Aiding in the design of the production structure, accounting and wage systems and qualification programs.

At Felten & Guillaume, researchers participated in the planning and introduction of production islands, management structures and information systems that supported these islands, and training measures (Klingenberg and Kränzle 1987: 12).

Not only research institutes were involved in this line of work, but also consulting firms. In The Netherlands for example, consultants from Bakkenist, Spits and Co. helped the tin can factory TDV change from a function-oriented to a product-oriented organization.

In Sweden, researchers found that the way in which ball bearing manufacturer SKF measured productivity did not stimulate workers to improve production. They developed a new system "which increases job motivation and raises productivity, and will not be used for central control in the conventional way" (Hellstrand 1989: 18).

For STACO (steel grid), researchers made a "qualification concept".

Further examples are a new job grade system for a stevedoring company in Rotterdam and a new pay system in the German clothing industry.[36]

There are indications that there is a real demand for social science expertise on organization transformations. In the early years of the Humanization of Working Life program, researchers tended to focus on data collection. Later, companies wanted rewards in return for providing access for research. Initially, managers expected researchers to moderate in power conflicts. Later, researchers had to contribute expertise. Sociologists who did not go ahead in this direction, could forget about doing research in the Humanization of Working Life / Work and Technology programs.[37]

Box 4.5 "Pure" action might not make it, but in the long run, "pure" research might not make it either

One of the plants that I visited had been a research site in the 1980's where two famous sociologists collected data for a landmark study. However, their reputation inside the plant was not nearly as brilliant as their scientific reputation. They were seen as "spongers", who just collected their data, never to be heard of again, being only interested in producing their publication.

> However, the research institute changed its policy shortly after the study that caused dismay. It now routinely reports back to the company that was studied, six months after completion of the data collection. This led to a request to the institute to support the development of teamworking in a car-producing company.

Consultancy and monitoring

Anti-Tayloristic consulting firms like the Dutch ST Group can clarify options for management and suggest ways to overcome stagnation and setbacks. A example of an organization where such consultancy was instrumental is the Van Nelle tobacco processing plant in The Netherlands.[38]

Evaluation

In most of the cases some form of evaluation took place, sometimes with before-and-after measuring. An example of this is the evaluation of the training program at Opel Hoppmann.

Box 4.6 Evaluation and training at Opel Hoppmann

> In 1975, Opel Hoppmann started with a project consisting of evaluation research and a training and organization development program to further develop the participation model. Researchers conducted a survey among the Opel Hoppmann workers and a control group consisting of workers from another Opel retailer. Job satisfaction turned out to be higher at Opel Hoppmann (92.5 per cent satisfied) than in the control group (87.4 per cent), but this difference was not statistically significant. The motivations of the workers who were satisfied with their jobs, however, diverged widely. In the control group, 21.8 per cent indicated "because I know that in other firms it is not any better". None of the Opel Hoppmann workers chose this answer category. For them, social climate (Hoppmann 51.9 per cent, control group 21.8 per cent), social benefits (Hoppmann 15.5 per cent, control group 3.6 per cent) and management behavior (Hoppmann 17.1 per cent, control group 9.1 per cent) were important motives. Half of the Opel Hoppmann workforce expressed willingness to take part in the firm's representative bodies, against 40 per cent in the control group (Hoppmann and Stötzel 1981: 83-85).
>
> The ensuing training and organization development program consisted of 33 seminars.[39] Besides general discussions, there were sessions focusing on practical problems and solutions. Examples involve redistribution of tasks, and research and decision-making in connection with automation. After one of the seminars, managers collectively made the following statement: "We commit ourselves to a democratic conception of

> management. The point is not to discard management in the enterprise, but to reduce it to the functionally required level and to check it democratically." (Hoppmann and Stötzel 1981: 131)
>
> In a seminar with spokespeople from the work groups, the idea emerged to create a small handbook on participation.
>
> After the two-year long training and organization development program, a second survey took place. The main difference compared with the earlier survey was that workers attached more importance to the work groups relative to the other participatory bodies.

Providing training to management

In several cases, researchers applied training to enlighten managers. In Rotterdam, the Port Authority organized training in sociotechnical design principles for managers (and works council members and trade unionists) of stevedoring companies. Holec had in-house evening classes given by a sociotechnical researcher/consultant[40].

Influencing management views to make these more radical

Originally, the owner of steel grid producer STACO in Germany was attracted to the Humanization of Working Life program because he wished to combine rationalization with noise reduction. Preliminary discussions at the project agency and discussions during the starting phase of the project caused a shift of emphasis from reducing purely physical strain to changing the work content, to job enrichment and decision-making on the shop floor (Lauenstein and Stapelmann 1992: 23-24).

From the examples we can conclude that researcher involvement can make a difference. However, it is important to note that there are cases of very successful change with minor researcher involvement. An example is The Halmstad County Hospital (see case description in Chapter Three) where grassroots mobilization was the driving force behind an effective organization redesign process. Characteristic in this case is the freedom to maneuver that the innovators enjoyed. Because of this, one would be hard-pressed to find ways in which outside consultants/researchers could have achieved a more thorough process of change.

On the other hand, there are cases that enjoyed extensive researcher involvement, but where it resulted in little change. An example is the Unitcenter container terminal in Rotterdam (Spanjersberg 1992).

Especially those cases, in which social scientists took the initiative to start participation projects, met with little success. The main thrust of these projects was to enhance participation through the creation of problem solving groups. An example is a project in a machine tools

construction department of medium-sized firm in Baden-Württemberg (Girschner-Woldt 1986). In this project, sociologists interviewed all workers to obtain an overview of the problem areas. Then they organized five problem-solving groups, each numbering between six and seventeen participants. In each group, a member of the works council and a sociologist were present. Management representatives did not take part in these groups. In their final report, the researchers themselves concluded that nothing changed as a result of the project. This case reveals limits on the influence by external policy makers on the implementation of consensual alternatives: a certain level of commitment to anti-Tayloristic change among line managers is a necessary precondition. Also, there must be a real demand from within the organization in which the consensual alternative is to be developed.

Box 4.7 Researcher involvement is not necessarily without friction

In one of the cases, a German engineering firm, there were several points of friction between industrialists and researchers as evidenced by the following list of complaints shared by the production manager and the chairman of the works council. All of these point to errors by researchers and culture clashes:

"One of the researchers spent his spare time, or the greater part of his time, restoring old-timers. He had to introduce himself to the works council. He came right from his workshop, with dirty hands; he had simply put a parka over his tinkering clothes. The works council members sat there smartly dressed in suits and ties. The workers had a certain expectation about the appearance of a scientist [..].
This let itself more or less be glossed over. Later he went, together with a number of workers, to a fair to look at some new machines. There he took off his self-knitted sweater, revealing a shirt with one striped and one checkered arm. From that moment onwards, the workers never took him seriously, no matter how hard he tried."

"There was a seminar on planning. The woman, who was teaching, started to explain to the skilled workers how one builds a rack. I was sitting at the back, having invited myself as an observer. With one hand I had to hold on to my stomach with laughing, my other hand turned into a clenched fist. Later we hired two school-teachers. They could get the matter across. They organized an exam, because of this, the workers paid more attention."

"At the start there were information meetings. The workers would ask things like 'what's the use of it'. The social scientists would then say 'we are only moderators'. They did not want to make any statement. We had to take over, but the social scientists did not want that either. At this sort of meetings social scientists were taking video shots. Video

equipment had to be especially bought for this. The film was never shown to us."

      Further complaints:
- There were endless meetings, minutes of which had to be taken down.
- Industrial scientists would discuss grand views at length, but declined to help working out practical details, although it had been agreed that they would help.
- Paperwork that the social scientists produced, like questionnaires, looked sloppy (products of industrial scientists looked all right.
- There were internal conflicts among the researchers.
There was a debate on the wage system, whether there should be piece rates or hourly wages. The works council asked the workers which system they preferred, and they chose for the piece rate system. Nonetheless, the social scientists insisted that "Accord ist Mord" (piece rates are murder).
The trade union was involved in the project, through a humanization of working life advisory agency (HdA Beratungsstelle). Inside the plant, they were known as the gang of ten. One of their tasks was to prepare a presentation on bonus systems. What they produced instead, were "old-fashioned class-struggle stories". Management denied them future access to the premises. This was the start of a protracted conflict.

4.3 Strategies for diffusion

The classic strategy to foster diffusion is presenting star cases as examples for other organizations to follow. For this purpose, organizations involved in enlightenment programs published success stories[41]. Two of the Swedish research and development programs, the New Factories Program of the 1970's and the Development Program of the 1980's, included concerted efforts to disseminate the knowledge that the experiments generated. This was not to be done in the form of elaborate scientific reports, but in the form of easily readable, practically oriented publications. The Development Program in particular issued communicatively correct booklets (Utbult: 1988 & 1989, Hellstrand 1989, Burell 1989), some of them using human interest to drive the message home.

      In Germany, one of the points of criticism leveled at the Humanization of Working Life program was that scientists tended to write reports that practical workers were unable to read. This criticism gave rise to special projects for dissemination. For example, projects in the steel industry led to the development of guidelines for organizational design, aimed at practical workers. More and more, scientific final reports were left unpublished.

Notwithstanding the care involved in making success stories public, policy makers and observers are unhappy with the star case based diffusion strategy.

Reflecting upon disappointing diffusion from the Scandinavian development projects, Gustavsen, who is an insider in these projects, identified weaknesses in the heart of the star case-diffusion mechanism itself. He noted that the transfer of experiences from experiments entailed an unfavorable "discursive formation" (Gustavsen 1988: 3). The participants in the experiments face the task of explaining their complex experiences to outsiders who are not familiar with field experiments. In this process, the participants tend to get quickly overburdened, and are likely to lose legitimacy in the eyes of the outsiders.

In addition to this, he noted that changing a working organization is a too complex process to be brought about by copying a solution that has proved to be viable elsewhere. The development, for example, of a factory is a chain of thousands of events that has to be gone through from the beginning. This takes years, and thousands of practical problems have to be solved in the process.

Also in Germany, both observers and participants in the enlightenment activities are unhappy with diffusion:

- In a review of humanization activities, Bilderbeek (1987) concluded that the demonstrations project had high public relations value, but he doubted the possibilities for diffusion.
- In their account of the changes in the German car industry towards new production concepts, Kern and Schumann (1984: 48, 98) see the humanization debate and the humanization projects in the car industry as irrelevant for the changes.
- Looking back at the Humanization of Working Life program, a decade later, Schumann (1993: 190) wrote: "The teamwork concept did hardly go beyond the experimental field and it did not get widespread. As an alternative concept for the tested Taylorist organization of work, it did not develop enough power."
- According to Schneider (1990: 45) of the DGB (Trade Union Conference) the program convincingly demonstrated "the possibility for realizing conditions of work that are adapted to the human scale", but he added that the program "produced many disappointments from the point of view of the expected contribution to the improvement of working conditions".
- Representing IG Metall, Drinkuth (1992: 42) noted that "lacking impulses and structures for putting partly outstanding research results into practice and to diffuse these" were a large weakness of the Humanization of Working Life program.
- Altmann, Düll and Lutz (1985) interviewed fifty-nine researchers about Humanization of Working Life topics. Researchers tended to be critical

about the value of development models and test projects (star cases). Some researchers found that these models and projects were indispensable to explore possibilities for development and constraints. Many, however, felt that possibilities for diffusion depended on business preconditions that were seldom made explicit. Research manager P. Oehlke maintains that even when these preconditions seem to be met, diffusion often does not come about.

Nevertheless, a few qualifications can be made:

1) Star cases did at least generate interest. The present study is an example. This interest can make an impact.

2) *Tayloristic* star cases like Ford in the pre-WW II era and Toyota *did* give rise to effective diffusion. Therefore, arguments ascribing the lack of diffusion in anti-Tayloristic cases to the star-case-mode of diffusion itself may be ways to avoid facing fundamental obstacles in the way of the consensual alternatives movement.

4.3.1 Diffusion networks

The unsatisfactory performance of the star cases mechanism gave rise to a new, network based model for diffusion. An example is the Swedish LOM program ("Leadership, Organization, Co-determination", 1985-1990). This program embodies the idea that the leader/followers pattern can be avoided by starting a set of parallel experiments while bringing together the participants in a network. This promotes communication based on equality, the idea being that everybody has something to contribute and something to learn. It seems likely that lateral contacts between various levels of changing organizations can help bring this about. Criteria for admission included interest in improving working conditions and in co-determination. The cost of the LOM program was about SEK (Swedish Crowns) 100.000 per participant, for coordination and research. Participating firms and institutions were brought together in clusters of four. Each cluster conducted a starting conference in which managers, unionists and "ordinary" workers took part. The starting conference was devoted to what the participants saw as a desired development of their work and to the ways to achieve this. In case of fear to reveal business secrets, it was possible to organize a starting conference for one firm alone. In the period after the starting conference, attempts were made to arrive at definitions for projects, of which research had to be a part. The role of researchers was to be supportive, they were not to structure the projects. Because of the emphasis on developing a network between change-oriented individuals, the LOM program can also be seen as an attempt to organize a social movement. The architects of the LOM program did not make this comparison. They called the desired process

"democratic dialogue" or "discourse formation" (Gustavsen 1988: 55; Von Otter 1990: 3).

However, according to Von Otter (1990: 3), the LOM program produced only one or two successful local networks of firms. In his official evaluation of the program, Naschold (1992a: 130) reports that in practice, the instrument of clusters was hardly realized.

In Germany too, a network based strategy for diffusion developed. An example is the "alliance project" ("Verbundprojekt") in the foundry industry. An evaluation of earlier projects had shown that "isolated measures did not strike home". Therefore, the project agency started an alliance project. Its core consists of four large foundries, each of which concentrated on a different aspect. Four smaller foundries try to adopt the solutions. Three institutes that perform supporting research provided the cross-linking. Regular meetings took place, hosted in turn by the participating companies. For some meetings, more companies from the industry were invited.[42]

4.4 Developing anti-tayloristic technology

In an article first published in 1974, Stephen Marglin (1982: 286) wrote:

> "Were the social sciences experimental, the methodology for deciding whether or not hierarchical work organization is inseparable from high material productivity would be obvious. One would design technologies appropriate to an egalitarian work organization, and test the designs in actual operation. Experience would tell whether or not egalitarian work organization is utopian. But social science is not experimental."

Nonetheless, since then, enlightenment programs made some attempts in this direction. Writers on organization have pointed to technologies that are Tayloristically biased, like CNC (computer numerical control), expert systems and centralistic logistical systems (see Chapter One). Some people are not content with just producing arguments, but have tried developing an anti-Tayloristic technology. Activities in this field took place in Sweden, funded by the MDA program and in Germany, funded by the Humanization of Working Life / Work and Technology program. ESPRIT, the European Strategic Program for Research and development in Information Technology program, financed one project, the "Human Centered CIM (Computer Integrated Manufacturing) Systems" project. This is an exceptional project, since the outlook of European Research & Development programs tends to be Tayloristic: adding ever more technology and moving towards more complex automation.[43]

Typically, the idea is that interdisciplinary teams with social scientists and computer scientists do the development work. In the Swedish MDA program, an interdisciplinary approach was a precondition for funding.

The programs included various technical projects that tied in with the debate on the relation between technology and Taylorism.

CNC-related projects

As indicated earlier, the introduction of CNC entails the risk of a deepened separation of conception from execution. To limit this risk, efforts were made to adapt control systems in such a way that these become easier for skilled machinists to program. This helps preventing the division of labor between operators and programmers. And in cases where CNC is already in use, shop floor programming means job enrichment for operators. The German administration subsidized the development of a programming system that used a graphical interface instead of a programming language. The idea was to make shop floor programming more feasible by making use of the skills that the machinists possess. A second project went a step further by integrating traditional manual controls into the software. This enables the program to develop while the machinist produced the first workpiece using the manual controls. Thus, the goal was to close the gap between conventional control and CNC. This was part of a project aimed at "stabilizing" older workers in small and medium sized businesses (mathematical programming requires a way of thinking that skilled workers are not used to).[44]

Planning systems that support decentralization of responsibility

A relatively large proportion of the projects focuses on developing planning systems that support decentralization of responsibility. One of these is the planning system ACiT (Appropriate Computer integrated Technology), developed at the U.K. BICC company, as part of the Human Centered CIM Systems project of the European ESPRIT program. ACiT is a tool for capacity planning in manufacturing, i.e. for planning what should be done, when and at which workstation.

Box 4.8 ACiT

What makes ACiT into a "human centered" (and an anti-Tayloristic) program?
- Planning with ACiT is not automatic, but interactive. The program does not impose solutions on the user. On the contrary, it supports decision-

making through its simulation capability and by presenting relevant graphical and numerical information.

- ACiT is meant for use in organizations that have delegated part of the planning activities to production cells or teams on the level of the shop floor.

In ACiT, planning takes place on two levels. At the highest level, that of the central planning department, planners make a rough capacity planning and allocate work over the various production departments or cells.

The lower level is that at the production department or cell. Here, workers perform an exact scheduling of work, based on locally gathered data, and monitor whether production proceeds according to schedule. This approach enables planners at the high level to concentrate on satisfying customer demands, without getting bogged down in detail planning.

ACiT runs on small computers that are linked by a local area network. Its main parts are two modules, the "Factory Planner" for the central planning department and the "Cell Scheduler" for the semi-autonomous production cells.[45]

The Factory Planner

Let's suppose that new orders arrive at the central planning department. To fit these orders in, planners can use the Factory Planner to view a model of the entire factory. In this model, every cell or department is a separate production resource, basically as a black box. The Factory Planner shows the workload of all cells in the coming period. Bottlenecks stand out in red. The planners give the new orders the status of "provisional" and enter them into the model, allocating them over the cells. By simulating, they can plan backward from a given delivery date to arrive at an optimal rough capacity planning. The rough capacity plan results in lists of provisional orders that are made available to the Cell Scheduler modules that are running on computers in the various cells.

The Cell Scheduler

The Cell Scheduler can retrieve the list of provisional orders that are assigned to that particular cell. Workers can use it to produce a schedule of the various operations that will take place in the cell's machines of workstations. They can enter constraints, for example, that a certain machine is not available during a certain period. By simulating the work in the cell, they can assess whether the raw planning, made by the central planning department, is realistic. The Cell Scheduler allows the user to choose between several algorithms to produce schedules. Apart from using algorithms, it is possible to create a schedule manually.

ACiT represents the chosen schedule in a Gantt chart, showing jobs as bars located along a time axis. By simulating alternatives, workers can arrive at an optimal schedule.

When the workers in the cells signal to the planning department that the proposed rough production plan is realistic, the central planners can turn provisional orders into definitive ones. In the cells, the Cell Schedulers use these definitive orders to make final adjustments to the schedule and to print lists of operations for the various machines. In case of an unforeseen difficulty, simulation of the production process in the cell scheduler makes it possible to find a solution. The Cell Scheduler helps tracking the execution of the plan by means of links with manual or automatic data collection systems.

The simulation capabilities of the Cell Scheduler are far-reaching. For example, users can easily add a hypothetical extra machine to the model and find out what the effect on the lead time would be. The features of the Cell Scheduler should make it possible to make use of the local knowledge that workers in the cell possess, and to develop this knowledge further.

Visual programming tools

Another MDA project deals with computer support for creative work. This project is not, in the first place, directed at the elite that already enjoys creative work: "On the contrary, an attempt is being made to demonstrate the opportunities available to enrich and upgrade the level of expertise in jobs which, at present levels of applied technology, are both repetitive and impoverished". One of the areas in which this is attempted is "visual programming" (programming by manipulating visual representations on the screen). "The intention is to develop such methods not only for use by professional programmers but also for the benefit of occupational groups where no programming takes place at present, but where it could represent an enriching input into the work in question." (MDA 1989: 1)

Development of CNC programming tool for machinists, decentralized planning systems, and tools aimed at job enrichment by adding programming tasks, fits in closely with the debate on the relationship between technology and Taylorism.[46]

4.4.2 Making an impact

Most of the technology projects result in methods laid down in learned papers and/or in prototypes. The aim of these projects is to improve the content of jobs *indirectly*. For example, research results can be used in the training of future managers.[47]

Changing software developers' attitudes is an implicit goal of the German Work and Technology Program (Gorny 1992). The desired attitude involves "systematically taking into account human-centered design goals". Developers should build into their products leeway for the users to

decide how to carry out their work and to enable the users to shape the labor process.

Schwab (1992) notes that in industry, the idea of user participation tends to have a restricted value. Developers tend to underestimate the pay-off of user participation. In humanization projects, on the other hand, user participation involves preparation and support through education. It also entails ample time allotment and a symmetrical balance of influence between systems developers and users.[48]

There are serious limitations to the strategy to achieve change in the workplace by educating software developers: software is a global business; Europe is a net importer of software.

Apart from these indirect interventions, there are projects that take a more direct approach to social change by trying to develop marketable products.

Typically, these projects involve companies that are focused towards marketing and towards developing marketable (software) products. According to an evaluation of German humanization projects in the area of software (Gorny 1992), this is necessary because scientists do not know how to sell.[49]

The cooperation between scientists and commercial developers is not necessarily trouble-free, since they have different interests. In one project, developers were very dissatisfied with the attitude of some of the scientists, who were busy working on a book rather than aiding in the practical work (scientists from another country helped out). On top of that, the book fails to mention the resulting marketable product at all.

A further step towards success in the marketplace is to establish links with organizations that have a need for the intended product. This helps to get inspiration as to what features to include in the design.

Getting user organizations involved is a double-edged sword. It does not only give inspiration but it also provides demonstration cases that can help to establish to product on the marketplace. In the case of ACiT, this went wrong. BICC management pushed out ACiT's developers, in favor of the development of Taylorist planning systems based an artificial intelligence techniques.

The developers of ACiT formed their own company, Human Centered Systems, but had to scramble to find organizations that would be willing to be the first to try out the new product.

The German Planleit project (also aiming to develop a planning system) involved an extensive network of participating user organizations. The input of all these firms led to too much functionality in the finished product, making it too difficult for skilled workers to use. Even scientists, specialized in designing planning systems, needed a few days to climb the learning curve.

The harvest in terms of software projects that enjoy some measure of success in the market is small: three cases out of a total of fifteen.[50] It would be wrong to attribute this to the specific non-Tayloristic character of the projects. EEC/EU information technology projects in general are known for lack of success in the marketplace.[51] For purely commercial technical projects as well, the road to success in the marketplace is perilous. Notable casualties are IBM's Displaywrite word processing program and Philips' V2000 video system.

Even if the project leads to a product that finds its way into the marketplace, this does not necessarily mean that the humanization goal is being achieved. Humanization projects in the field of software run the risk of resulting in products that may be very usable, but that do not promote social change in the workplace. For example, the final report on the change project in the Rietbergwerke states that an information system will be implemented that supports decentralized coordination. But a visit, several years after the appearance of the report, made clear that the system was indeed in use, but that it did not fulfill its intended role in promoting decentralized coordination. The manager told that "there was nothing humanizing about the system". The design of the system allowed every worker access to the data, but it simply did not happen that, for example, a welder would use it. Welders would just ask for information that they needed, because they found that easier.

Schnepel-Boomgaarden (1991: 92-93) warns that it is possible to use software systems in ways that runs counter to the original goal. Especially "humanized" software is vulnerable in this respect, because it tries not to force the user into a passive role.[52]

Developers can try to avoid non-humanizing use by creating "religious" software, that presupposes a certain humanized way of working. By way of its two level structure, ACiT fits in closely with an organization that has decentralized planning. But even ACiT can be used for centralized planning. One customer had asked ACiT's developers to give the program the capability to try all built-in scheduling algorithms, choosing automatically the solution that leads to the fastest completion. This would only have required a few extra lines of code, but the chief developer refused, because it would violate the Human Centered philosophy.[53]

The problem with religious software is that it aims for a niche market. ACiT's target market consists of manufacturing companies with a cell-based organization and decentralized detail planning, that are also ready to introduce computerized planning tool on the shopfloor. Companies that showed interest in ACiT did not have the cell-based organization, while in many cell-based organizations there was no interest in a computerized planning tool for the shopfloor.[54] In these organizations, managers felt that manual planning systems were adequate.

Finally, there is a risk that projects spend humanization resources on a type of product that not-ideologically motivated companies are likely to provide as well. A case in point is visual programming. The MDA program was active in this area, while Microsoft and Borland were doing the same.

4.5 Subsidizing firms for implementing alternative organization models

Within the framework of consensual policy, subsidizing firms for implementing changes away from Taylorism seems odd, because these changes must be profitable by themselves. Nonetheless, subsidies do exist, Germany being the biggest spender. Since the start of the Humanization of Working Life program in 1974, the German government spent in the order of 100 million DM per year on change projects. Right from the start, participating firms had to bear half the cost. In this way, the Humanization of Working Life program gave expression to the tension between economic rationality and government intervention. Subsidies enable the state to impose conditions. One of these conditions was that to every change project, there had to be coupled a supporting social research project ("Begleitforschung"). This allowed social researchers access to companies and it made it easier for managers to acquaint themselves with applied social science knowledge.

Subsidized and non-subsidized projects are not two worlds apart. Both categories involve the same range of issues: alleviation of technical discipline, job enlargement, job enrichment, decentralization of responsibility and participation. This implies that subsidizing does not open up an entirely new realm of possibilities.

But are subsidies an effective catalyst for change? Official evaluations are a logical starting point for finding an answer. In Germany, the Batelle Institute embarked on a one million DM evaluation study on the Humanization of Working Life program. However, results from this study were never made public. Doing a comprehensive evaluation of the program must be a daunting task, considering that there were 1925 different projects in the period 1974-1991.

In the Humanization of Working Life program, it was not common practice to evaluate projects a few years after the intervention, to see if the effect persists. The program agency could only insist on this, when it was agreed upon in advance. Normally, this is not the case. According to a research manager, it is "difficult or impossible" to get grants for this type of evaluation. A rare case was an evaluation by F. Weltz of one of his projects in office work. He found that there was not a single trace left of his originally successful project. Also subject to evaluation are projects in

the foundry sector. These projects took place from 1974 till 1982. As late as 1992, there was permanent monitoring to see whether installations are really in use and are not rusting away.

By and large, the official evaluations that were available did not answer the question whether enlightenment programs are an effective catalyst for change. However, there was one exception to the underdeveloped state of evaluation. For the relatively small (total cost: fifty million SEK) Swedish LOM program, a comprehensive evaluation does exist. In this program, 148 organizations participated, ten of these dropped out along the way. In eight cases, there was some impact in the area of organization (Naschold 1992a: 8).[55]

The dataset, accumulated for the present study, made it possible to compare subsidized with non-subsidized cases. It turned out that among the non-subsidized projects, there is a significantly larger proportion that shows job enlargement (i.e. adding more tasks without raising the overall level of skill required), than there is among the subsidized projects.[56]

An explanation is, that job enlargement is merely a fast, direct route to labor costs reduction (and a modification of Taylorism rather than a break with it). This difference between subsidized and non-subsidized project suggests that subsidizing may help pulling projects off that initially do not promise an obvious financial gain through labor cost saving.

Some authors warn for "take-away effects" (Naschold 1992a: 122). Clear examples, however, were far and few between. There was one case at the beginning of the Humanization of Working Life program where an already existing project got subsidized.[57]

Of the many cases that show productive effects of subsidized activities, generally it is difficult to say whether these activities would have happened had these not been subsidized. In a few cases, however, interviewees pointed to facilities that would not have come into existence without subsidies. At Felten & Guillaume, subsidies made broad training possible. After the project, broad training is no longer available. Training is now restricted to learning specific new technology. In the Halmstad County Hospital, one extra worker was needed to start working in teams. Local politicians provided funding.[58]

4.6 The political level: Institutionalization of humanization policy

Up to this point, we have looked at two levels of anti-Tayloristic policy. The first level consists of what managers and workers are accomplishing inside consensual alternatives. The second level entails the activities of researcher-consultants, who support consensual alternatives. Now we move on to the third level, that of political activities designed to enable and sustain the activities on the second level.

A long-term effect of policies to promote, support and subsidize change in the workplace is institutionalization of humanization. This is the case in the Humanization of Working Life program. Auer, Tergeist and Penth (1983: 12) observe that the term "humanization of working life" has become "an element of everyday speech with union officials, employers, government officials and media". They describe "Humanization policy" as a "political alliance, that includes unions, employers' organizations, the state apparatus and the science system". According to Paul Oehlke, a decisive effect of the program is that a far-reaching consensus developed between employers and unions about wishes in the area of humanization.

IG Metall's A. Drinkuth noted (in 1994) that in the course of fifty post-WW II years, a culture developed between employers and unions, in which the parties are able to trust each other. "In this culture, it is the arguments that are being listened to. Who is saying what, is less important", Drinkuth said, "it is a space outside the class struggle". The Humanization of Working Life Program exploits this space. Drinkuth credits union influence for the continued existence of the program, stating that IG Metall was successful in getting the importance of the program across to politicians.[59]

The strength of consensus on the need for humanization policy is evident in the history of the Humanization of Working Life Program. It suffered attacks from several sides, but its basic approach remained unscathed.

In the mid 1970's, following experiments in engine assembly at Volkswagen[60], IG Metall opposed the introduction of semi-autonomous teams. Reasons were:

- A system of semi-autonomous teams would mean competition for the system of co-determination (the union had to protect the powerful works council chairpersons);
- Fear that weaker workers would be pushed out (the "Olympiareife Mannschaft");
- Uncertainty about new wage systems.

This opposition caused the term "semi-autonomous teams" to vanish from the program's dictionary, to be replaced by "work structuring". The content of the program, however, did not change by this.

In 1979, IG Metall complained that the program had brought hardly any improvements for its members but instead brought some deterioration, among which speedups without wage increase and jobs being rationalized away (Wilfert 1984: 56). On the other hand, employers felt that in its early days, the program worked exclusively in the interests of the employees (Heß 1993: 38). From their point of view, there was not enough recognition of the relation between the goal of humanization and economic efficiency. They criticized unions for putting humanization before efficiency and for wanting to lay down work content and skill

levels in advance and thereby to pre-program wage increases (Wilfert 1984: 48-58). Furthermore, radical social scientists irritated employers. This feeling was expressed by P. Wilfert (1984: 58) who wrote, in an "Employer's Assessment":

> "Social scientists often seek to bring about thorough-going changes in society and use their scientific work in the humanization projects to raise the worker's willingness to raise their demands. This can be authenticated by declarations such as: 'Increasing worker's readiness to fight to achieve their interests is the key precondition for realizing the concept of work humanization which aims equally at a structural change in the conditions of work and society'. Or: 'The researcher cannot be shut out of the world of conflicting interest; hence he must ask himself who will benefit from his work and who is harmed by it; and he must adapt his way of acting accordingly'".

The employers' organization BDA demanded that:

> "Research on work sciences, especially in the field of the social sciences, must not unilaterally side with the presumed interests of the workers".

In Parliament, the Christian Democratic parties (CDU and CSU) appeared receptive to the employers' views. However, the employers did not want to see the program discontinued. When the Christian Democrats came to power in 1982, both employers' organizations and unions spoke for continuation. In fact, in 1983, the new government decided to retain the program, but it stipulated that the program should support the integration of humanization and innovation (Dankbaar 1986: 42). The intention was to restrict subsidies to projects that promised economically viable results. But the program's Advisory Board was not ready to reject proposals on grounds of economic viability. The Board noted that:

> "Proof of economic viability of projects around humanization is necessary. But this should be based on the same type of criteria as used in areas like advertising, research and development. In those areas as well, it is difficult to estimate the specific contribution to the firm's performance." (Dankbaar 1986: 43)

In 1987, there was a new wave of criticism from the Christian Democratic fraction in Parliament. Points of criticism were that subsidies went to large firms and to unions and that the social research was of questionable quality.

This criticism led to the replacement of the "Humanization of Working Life" program by a new program "Work and Technology". However, apart from the changed name, there was continuity between the two programs. Some observers perceived in the history of the German enlightenment programs a de-radicalization and a shift from humanization to effectiveness.[61] This may be so at the level of ideology, but there was no evidence that this was the case in terms of impact at the level of the shop floor.

In Scandinavia, institutionalization of humanization policy took place as well. In Sweden, in 1972, the Arbetsmiljöfonden (Work Environment Fund) was created. This organization is engaged in education and in the setting-up of development programs aimed at using new technology in such a way, that democracy and participation on the shop floor are promoted, and worker satisfaction and skill levels are raised (Gill 1985: 146-147). The work environment fund is, with consent of the unions, largely financed by the employers in the form of a levy on wages.

This involves around SEK 500 million a year (Gill 1985: 146). In connection with the Co-determination Act in 1977 the Arbetslivscentrum (ALC, Swedish Centre for Working Life) was created, financed by Arbetsmiljöfonden. (ALC later became the Institutet för arbetslivsforskning - ALFI, The Swedish Institute for Work Life Research.)

The center was to deal with co-determination issues via research, dissemination of information and consultancy. The government proposal specifies that the research should, for a large part, consist of action research. The Arbetslivscentrum is controlled by a supervisory board with representatives of unions, employers and the Swedish state. The Work Environment Fund financed programs as diverse as the LOM program and the Development Program.

The institutionalization of humanization policy helps diffusion of organizational innovations. It leads to an increased visibility of the humanization debate and draws opinion leaders among managers into it. Furthermore, it helps provide "cues-to-action" - events that cause a favorable attitude to crystallize into overt behavior change (Rogers 1983: 222). A research manager explains how such a cue-to-action can come about:

> "A head of a department, who wants to go higher up, contacts a scientist that he knows, or the other way around. They get together and draft a proposal. When the board of directors takes a favorable view, a grant is applied for. In this way, a successful project can develop."

Continuous funding, as it exists in Sweden and in Germany since 1972 and 1974 respectively, provides for a constant impetus for change ac-

tivities. In The Netherlands, where no comparable funding was available, change activities came in waves. The first wave died out in the mid 1970's. A second wave developed in the late 1980's. According to Van Klaveren (1994: 13), Dutch quality of working life policy is not very "crisis resistant".

International comparative literature indicates that in the U.K., there was relatively little activity to change working organizations (Auer en Engel 1983: 105, Gill 1985, Den Hertog and Schröder 1989). Explanations point in the direction of antagonistic industrial relations.

4.7 Conclusion

Taken together, there is, especially in Scandinavia and in Germany, a good match between, on the one hand, the requirements posed by initiatives to create consensual alternatives and, on the other hand, enlightenment activities. By replacing the star cases diffusion mechanism with the network based diffusion mechanism policy makers showed a capability for innovation.

CHAPTER FIVE CONSENSUAL ALTERNATIVES: ACHIEVEMENTS IN JOB DESIGN

Job design is the final touchstone for determining whether anti-Tayloristic policies are successful. This chapter presents the outcomes in terms of job design of the consensual stream of anti-Tayloristic policy. To recapitulate: the mechanism for change in the consensual stream is the consensual alternative, that is, managers and organization experts creating an alternative inside their own organizations, with the support of workers' representatives. External enlightenment policies link up with the dynamic of consensual alternatives, trying to stimulate their genesis and to support their development. This chapter evaluates the outcomes of the entire chain of activities that start with *enlightenment* (independent variable), runs through the *development of consensual alternatives* (bridging variable) and ends with the dependent variable *de-Taylorization of jobs*. The previous chapter offered an assessment of the contributions of the various types of enlightenment policies, now the entire chain is taken as a whole. I surveyed sixty-two cases of consensual alternatives (these were the cases for which sufficient information was available) for indications of shifts away from Taylorism at the shop floor level.[62] The observed changes fall into five categories:

- alleviation of technical discipline;
- job enlargement;
- job enrichment;
- decentralization of responsibility;
- participation.

5.1 Alleviation of technical discipline

Initiatives involving alleviation of technical discipline took place mainly in the electronics, electrical equipment and automotive industries. Fig. 5.1 gives an overview of the various forms. The prime target for change was the assembly line. Some initiatives did not go further than modifying the assembly line concept. Other initiatives entailed abandoning the assembly line concept altogether.

A slight modification of the assembly line concept is the introduction of buffers, thereby insulating workers from the pace of the line. Examples are an experiment in the 1970's by Bosch with buffers in dishwasher production, and the introduction by AEG-Telefunken of buffers in electric motor assembly.

A second type of modification is the use of AGV's (Automated Guided Vehicle), computers controlled carriers, instead of the traditional

assembly line. In the Volvo car plant in Kalmar, AGV's moved the cars being assembled from work station to work station. The production line was subdivided into sections. Each section was manned by a team of 15 - 20 persons. Per section, the work was split up over four or five work stations, successively attended by the AGV. Workers could follow the AGV along the work stations within their section, doing all the work to be carried out within that section (Agurén et al. 1984, Berggren 1989). In the early 1970's, Volvo started in Sweden with engine assembly using AGV's as well, in its Skövde plant.

A third modification in the assembly line concept is dock assembly. In dock assembly, objects can be taken out of the flow, to be worked upon for a longer period. Volvo Kalmar used this method in conjunction with the AGV system. This meant that the AGV could be brought to a stop at a work station for a longer time to enable a more extensive task to be carried out. This system was aimed at stimulating group work (Agurén et al. 1984, Berggren 1989).

Mercedes-Benz uses AGV's and docks in its Bremen plant in the production phase in which workers install the wiring into the C class cars. For mounting folding tops and installing wiring in the SL sportscar, Mercedes uses "star boxes". In this system, cars come from above and turn into empty docks. When the job is done, the worker signals that the car can re-enter the stream.

At DAF Trucks, attempts to get rid of the assembly lines are restricted to one experiment with dock assembly. In this experiment, workers take some of the engines, that are finished as far as the inside is concerned, off the line and put these in stationary docks. Then they complete the engine by attaching external parts. This experimental set-up allows comparison between line assembly and dock assembly. The completion phase is relatively amenable to dock assembly since there is a considerable variation between engines in terms of external parts. Assembly of the interior parts will continue to take place on a line, because of the use of expensive machinery.

Comparable arrangements exist for assembling smaller items, like electrical appliances. In the 1970's, the Bosch group experimented with several ways to assemble loudspeakers in groups rather than on an assembly line. The alternative lay-outs featured work stations grouped together. This saved the workers from the strain of being paced by the assembly line. Furthermore, their tasks became somewhat wider. Other experiments were in the areas of sub-assemblies for color television sets and electrical hand tools. Group assembly of remote control units showed that large series could be effectively produced without an assembly line.

In all these modifications of the assembly line concept, products under construction move from work station to work station. Abandoning the assembly line concept implies keeping the object being assembled in

one place. In the 1970's, Bosch experimented with a system in which all workers assembled entire car radios. AEG introduced complete assembly of power drills to replace assembly line production. One of the stated goals was enhancing flexibility so that two models could share the same production facilities (Klingenberg and Kränzle 1986: 29-38).

In the early 1970's, Volkswagen experimented with complete assembly of gasoline engines. Klöckner-Humboldt-Deutz, producer of diesel engines, changed from an assembly line over to "assembly islands". The change was motivated balancing losses and a need for more flexibility. This was not an experiment, but a real change (Klingenberg and Kränzle 1986: 39-50).

In car assembly, the traditional lion's den of Fordism and Taylorism, Volvo took the most radical step with its new plant in Uddevalla. This factory was subdivided into six analogously operating mini-factories in which the assembly took place. Each car was assembled in one place, that is, without being moved from that place. Apart from the six mini-factories, there was a central warehouse. Thus, the organization of assembly was decentralized, the supply of materials was centralized. The mini-factories were supplied with the bodywork, already painted and made in Gothenburg. The further components necessary to assemble the car on the basis of the bodywork were collected in the warehouse and delivered at the bodywork as a kit by an AGV. Assembling was carried out by teams of eight to ten persons, working together on four cars at the same time.

Nearly all initiatives that involve alleviation of technical discipline aim to modify or to replace assembly lines. In two cases, Volvo's "E" engine plant in Skövde (Gyllenhammar 1977: 109) and tin can factory TDV in The Netherlands, there were changes that saved workers from being tied to one machine. This granted them at least some freedom of movement. Consensual alternatives that involve abandoning computerized disciplinary systems, like the systems that control warehouse workers, were not to be found.
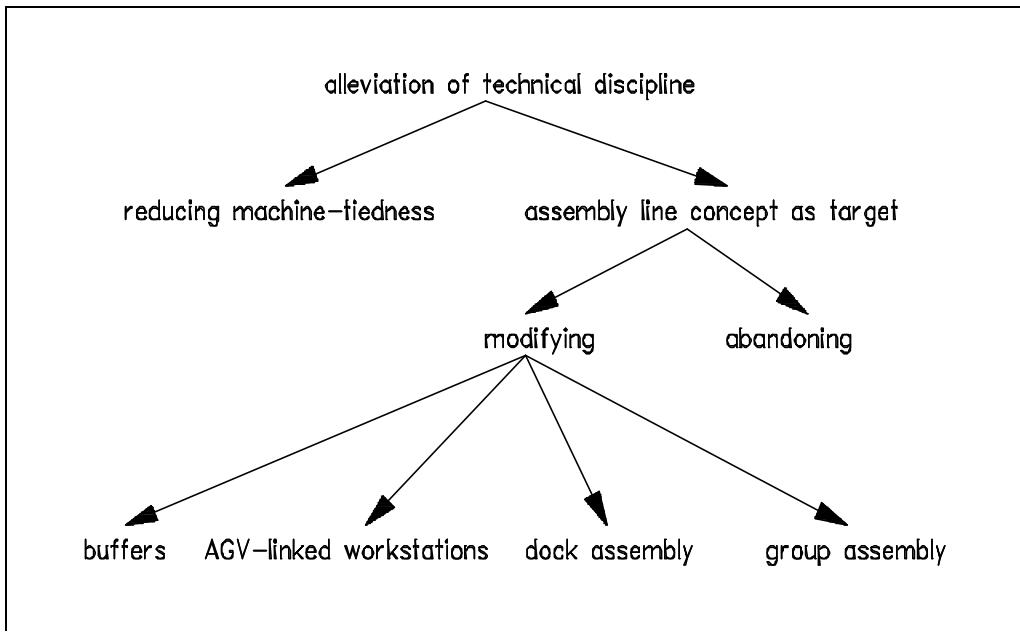
Fig. 5. 1 Forms of alleviation of technical discipline in consensual alternatives

5.2 Job enlargement

A way to push back system losses is "job enlargement". Job enlargement means assigning to workers additional tasks, that do not require a higher level of skill than the original task.[63] It does not represent a break with Taylorism, rather a modification of it. As such, it fits into an array of strategies to compensate for the dysfunctions of Taylorism: high wages, a positive corporate image, a pleasant working environment might compensate for inherent boredom and meaninglessness.

While job enlargement increases variety in work content, it may can lead to job degradation when lower-quality tasks are added. As an example, crane operators in the Port of Rotterdam are generally not enthusiastic about job rotation, since operating a crane is the most craved for and best paid of all operational jobs. A dockworker analyzed this as follows:

> "In fact everyone is a terminal worker. The consequence is that you can be assigned to any task, in the sense that a skilled person, for example, a van-carrier driver, can be employed as a lasher, while a lasher, when there are not enough van-carrier drivers, can not be employed, because he does not know the work. Thus, it is a trick to make skilled people do unskilled work." (Gezamenlijk Aktiekomité van Rotterdamse Havenarbeiders 1979: 24)

Typically, alternatives to the classic assembly line entail some job enlargement. Tasks become somewhat wider, but not necessarily more complex. For example, the evaluation report on an experiment in loudspeaker assembly at Bosch describes the change as "stringing together the easiest tasks" (Heinrich and Schäfer 1982: 83). A convenient indicator for this type of job enlargement is the change in work cycle time. A Philips publication on work structuring states:

> "In the old arrangements, job cycles of five to ten seconds were no exception. Among eight different experiments, cases were found in which job cycles were extended to ten or twenty minutes and even to more than one hour." (Philips 1968: 9)

An evaluation of German humanization projects in the period 1974-1980 showed that on the average, work cycle times doubled (Projektträger "Humanisierung des Arbeitslebens" 1981: 93). For the relevant cases in the present study (for which information on cycle times was available), see Table 5.1.

Table 5.1 Cycle times before and after change

Initiative	Cycle time before change	Cycle time after change
AEG-Telefunken electric motor assembly (AEG-Telefunken 1983b)	48 seconds	96 seconds
Bosch-Siemens washing machine assembly (Wexlberger 1984, Klingenberg and Kränzle 1986: 67-90)	2 minutes	4 minutes
Philips TV assembly in groups of 7 instead of line with 30 workers (Den Hertog 1975: 85-92)	3.5 minutes	20 minutes
Philips - groups of 3 instead of line (Philips 1968: 33-35)	50 seconds	13 minutes

In lean car plants, work cycles are generally around one minute (Womack, Roos and Jones 1990: 101). Table 5.2 shows that longer cycles may be achieved.

Table 5.2 Cases in the automobile industry

initiative	cycle time
Volvo Skövde, engine assembly using AGV's (Forslin 1992: 13)	2 - 20 minutes
Volvo Vara, engine assembly - one worker assembles two half engines per day (Forslin 1992)	4 hours
Volvo Kalmar, car assembly using AGV's (Berggren 1989: 183)	maximally 25 minutes, when workers followed the AGV along the work stations within their section, doing all the work to be carried out within that section.
Volvo Uddevalla, complete car assembly	several hours
Mercedes-Benz Bremen, installing soft top and wiring in SL sportscar using "star box" arrangement (dock assembly)	> 1 hour

In addition to lengthened work cycles, three more types of job enlargement were in evidence (Fig. 5.2). Institutionalized cooperation can serve to enlarge jobs. An example from the 1960's is the Industrial Democracy Project in the Hotel Caledonien in Kristiansand (Norway) (Gustavsen and Hunnius 1981: 51-56). One of the changes introduced was that in the grill restaurant, waiters en cooks shared responsibility for cooking and serving. A formal way to organize job enlargement is job rotation.[64] A case that combines job rotation with a sort of dock assembly is the first pilot project on teamworking at Mercedes-Benz in Bremen. This project takes place in the phase where pre-assembled T and SL engines are completed by mounting hoses and several other parts. Before the project, assembling took place on a line, with the engines sitting on carts, that were pulled. T and SL engines shared this same line. This was not efficient, since the SL (station car) engine required more work than the engine for the T model (sportscar). In this situation, workers rotated tasks. The pilot project involved moving the work on the SL engine from the line to newly created "boxes". Boxes are floor areas which are separated by racks filled with materials. The team takes care of assembling, transportation and collection of parts. Management demanded job rotation, and this worked out. The team members themselves proposed to discard the line altogether and to perform all assembly work in boxes. In their solution, each box has room for two engines at a time. All nine workers have the same

qualifications. All have obtained a driver's license for the electrical transportation vehicle. There is always one worker who collects parts and one worker who does the transportation. All tasks rotate.

Finally, there is the possibility that workers take over tasks that had formerly been part of jobs that no longer exist in the organization. For example, in the Hotel Caledonien, waiters started allocating guests to tables. Formerly, this had been part of the headwaiter's job, a job that was eliminated. Job enlargement (not job enrichment) in the German Prozos project in social security administration was of the same type. One of the goals was to make the job of the social security officer more complete. This meant that one officer had to be capable of performing all tasks, from registration of data to payment of benefits. This is job enlargement rather than job enrichment, since the additional tasks are simpler in nature than the older tasks. In the old organization structure, there were no specialists for difficult cases or for difficult parts of the process. There were clerical workers who handled chores like the typing of letters. Their tasks were integrated into the job of the social security officer. (The displaced workers did not become social security clients themselves, since there were jobs elsewhere for them.)
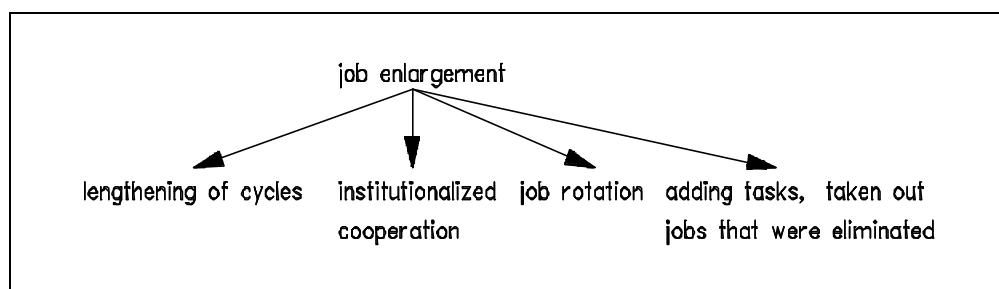

Fig. 5. 2 Job enlargement

5.3 Job enrichment

Quite apart from compensatory strategies like job enlargement, there are ways to break out of the Tayloristic patterns. Job enrichment is a strategy that does exactly this. Job enrichment is a movement in the opposite direction of separation of conception from execution. The essential criterion for job enrichment is that the required skill level increases. Job enrichment entails the addition of more interesting (complex) tasks such as elements of planning, work preparation, control, and support.

A way to achieve job enrichment is to combine previously divided tasks. Ceteris paribus, job enrichment for one worker means job impoverishment for another. This risk was clearly present in the Volvo Uddevalla project. Because a complete component kit was made up for each car, there was much more warehouse work at the Uddevalla plant than in

a conventional factory. In principle, this could have implied that the quality of work gained in the assembly would be lost again in the warehouse, because of the increase of dull operations to be carried out there. This risk was taken into consideration in the set-up of the material-handling system.

It would have been too expensive to automate all routine operations at the warehouse. In fact, the only thing automated was the collecting of quantities of small components. Consequently, there was still a lot of manual work, and it was mainly organizational measures that had to ensure an acceptable quality of work at the warehouse. Thus, it was decided to let some of the assembly work take place at the warehouse: rear axles, front members and exhaust systems were pre-assembled there.

In the warehouse, the employees were organized in teams. Tasks rotated so that the task of composing the component kits alternated with replenishing stocks (fork-lift truck) and putting together the "pre-assemblies". Buffers introduced into the material-handling system helped create some latitude in the operational process. At the SKF D3 factory, an engineer indicated that his job has, as a result of the enrichment of operator's jobs, become so narrow that he himself would eventually like to get job enrichment (Hellstrand 1989: 17).

If, however, new developments bring new, interesting tasks to the organization, this offers the opportunity to arrive at a redistribution of tasks that benefits all.

Box 5.1 Software development as an opportunity for job enrichment

Increasingly, the software industry turns out products that aim at making programming easier. "Programming" in this context does not only mean the creating of applications, but also customizing ready-made applications. Since the beginning of software technology, there has been a strong tendency to use the computer to alleviate the problems of programming. An important step was the development of "high level" or third generation programming languages, like COBOL, in the 1950's and 1960's. These languages insulate the programmer from the complexities of the hardware. In the 1970's and 1980's, a new era followed with the introduction of database management systems like ORACLE and dBase. A database management system (DBMS for short) is a computer program which serves as a tool for storing data in a database, for retrieving information from it and for keeping it up to date. The advent of the DBMS made creating information systems a much less technical affair (Pruijt 1993). Graphical tools that allow users to program without writing code, can take the development towards user programming a step further. Apart from this, many off-the-shelf applications feature programming tools that enable user to customize them.

Traditionally, there exists a strict division of labor between "users" and computer professionals. An explanation for this is the level of skill that programming required, and the time-consuming character that programming once necessarily had. Since then, the technical barriers for enriching jobs with some software development - a very direct way to gain more control over one's own job - are giving way.

This section presents the harvest in terms of job enrichment. As an analytical starting point, I will use the distinction between direct and indirect labor (Fig 5.3).

Job enrichment in the realm of direct labor can be summarized as a movement from fragmentation towards completeness. Change in qualification requirements is one of the items that can serve as indicators for job enrichment.

Box 5.2 Learning and training for job enrichment: some examples

In one experiment at Bosch, the goal was to allow (female) assembly workers to learn testing skills. This was not to be done through training, but through the design of the labor process itself, by creating "working structures with educational relevance". This implied that there would be no assembly line, and that there would be teamwork. There was a division of labor, but work-stations had a variable task content to accommodate different stages of learning. Task content of work-stations overlapped to encourage workers to learn from each other. Job rotation took place and variable buffers allowed some freedom to maneuver (Heinrich and Schäfer 1982: 84-114). Another experiment aimed to qualify all workers to assemble an entire radio, to test it and to package it. The works council remarked that the groups did not have any indirect tasks. In this experiment, training did take place (Heinrich and Schäfer 1982).

At Felten & Guillaume, the job enrichment required training: technical courses, product specific knowledge and communication skills. Workers were used to just receive orders, and now they had to make mutual agreements. They had to learn this.

In Volvo's Uddevalla plant, apart from practical training, employees received a three-day computer training course given by fellow employees. Employees also learned a few things about ergonomics and fire safety. Furthermore, they learned how to estimate the amount of time they need to carry out certain operations.

IHC provides training to make workers multiskilled, both within their fields and outside. For instance, an ironworker gets a welding course and the other way around. For coordinators, there are courses in guidance and management. These are general courses that have been adapted for use at IHC. Every course that is completed successfully leads to a pay

supplement. Policies regarding access to the courses vary. In the machine factory, access to training is restricted to control wage costs. In the shipyard, everyone can take any course.

In the Rietbergwerke, the training program offered seminars on planning, reading technical drawings (errors related to misreading decreased), technical matters and safety.

At Sigma Coatings, it is the intention to train all workers to become all-round operators. The pay system supports this, since it renumerates knowledge rather than performance. There was basic language training as well. A CITO test (a test designed for use at completion of elementary school) showed that a number of workers, among them several Dutchmen, had difficulty in reading and writing. A course to remedy this had a success rate of 95 per cent.

Change in pay is another item that can indicate job enrichment. To give a few examples: at Holec, everybody in the factory earned more - around 200 guilders per month (as a result of the changes); at Van Nelle, operators moved to a higher pay scale, now reaching the same scale as maintenance men. For many workers at Felten & Guillaume, the change brought higher pay, pay being based on skills rather than on performance.

In industrial production work, teams making complete products, and within these teams, workers learning to do a larger part of the work, can be the basis for job enrichment. In Volvo's Uddevalla plant, the training time required to master the assembly work was sixteen months. New employees learned from their fellow team members. A new employee on an assembly team was first given an easy task that could be done in one or two minutes. The more he learned, the more tasks he was given. After four months, he should be capable of assembling fifteen per cent of a car; after ten months, thirty per cent was a good result. The idea was that eventually everybody should be able to build thirty per cent of an entire car.[65]

In the summer of 1990, approximately twelve employees had learned how to build an entire car within the standard time, meeting the quality requirements. However, this was not a management goal, but rather a matter of honor for the employees involved.

This long learning process did not lead to marketable skills. Reportedly, the original intention was to train each group member to the level of skill of a qualified automobile mechanic (Auer and Riegler 1990: 37). This did not materialize.

Womack, Jones and Roos (1990: 102) criticized the designers of Volvo Uddevalla for a "very limited vision of job enrichment" describing the work as "simply bolting and screwing together a large number of parts in a long cycle rather than a small number in a short cycle". Their claim that lean production does better in this respect rests on the assumption that

routine jobs in lean plants will be automated away. As I have stated before, their own findings contradict this assumption: the most efficient plant in their survey was the least automated of the Japanese plants (Womack, Jones and Roos 1990: 94).

Job enrichment through teams making complete products occurs in other industries as well. An example is the German clothing firm Wolfgang März, where teams of twenty workers make complete products. According to a report, this requires a much higher qualification and means more interesting work (Lütteke 1991: 53-54). In banking and insurance, a way to achieve job completeness is to base the division of labor not on operations but on categories to which customers belong. In the German life insurance company Aachener & Münchener Lebensversicherung, teams take care of all the business of all clients in a certain geographical area. (Before the change, a single client's business was handled by five different departments.) All team members are in principle qualified to deal with any client (Müller, Münster and Nocker 1990). In the Vereins- und Westbank, each back-office team handles the money transfer work for a specific set of branches. In this case, the level of completeness is limited because there are two specialist teams that deal with exceptional cases. The changes in this company count as job enrichment, because it proved necessary for workers to acquire enhanced, albeit company-specific, banking knowledge. Job enrichment included error correcting and maintaining contact with branches.

Several cases showed an increased all-roundness of jobs as a result: in the IHC shipyard, the Tayloristic division of labor between marking, cutting, shaping, making sub-assemblies and final assembly has partly given way. Marking, cutting and shaping are now the province of all-round iron workers; a change project in a German steel works resulted in the formation of teams comprising sales, calculation, work preparation and quality assurance (Schulte-Hille w.d., Thienel, Richter and Zimmermann 1990); in a LOM project in an agricultural cooperation in Falköping (Sweden), field workers took on additional tasks like consulting on pesticides and credit matters (Naschold 1992b Anhang C: 28-49).

Finally, there are initiatives that upgrade jobs somewhat by adding more demanding tasks: in the Norwegian Industrial Democracy project in Hotel Caledonien in Kristiansand unqualified kitchen helpers started, for part of the time, doing more qualified work; in a steel firm in Hattingen (Germany), typists became sales assistants (Schulte-Hille w.d., Thienel, Richter and Zimmermann 1990).

In the County Hospital of Halmstad, pairs of assistant nurses and nurses keep the patients' records. They discuss the patient with the doctors, talk to the relatives and do the social planning, i.e. they arrange for the care that older patients need after they leave the hospital. Especially

for the assistant nurses, this meant job enrichment. Notwithstanding this integration of tasks, there remain tasks that only regular nurses can do, like intravenous injections, blood transfusions, administering drugs and tube feeding.

Apart from job enrichment in the realm of direct labor, it happens that jobs are enriched with indirect tasks. These indirect tasks can be management tasks or non-management tasks. Among non-management indirect tasks that enriched jobs were:

- Quality control: Philips work structuring projects in light bulb and electronic tube assembly (Den Hertog 1975: 93-108); a 1960's change project in a Dutch Postgiro data-entry center involved a shift from external to internal quality control (Van Beinum et al. 1969, Ramondt 1975); the diesel engine factory of Klöckner-Humboldt-Deutz in Ulm added quality control to assembly work (Klingenberg and Kränzle 1986: 39-50); experiments at Bosch in car radio assembly involved learning testing skills (Heinrich and Schäfer 1982); at the Tobacco unit of Van Nelle in Rotterdam, quality control was part of the teamwork; Holec Hengelo; at Sigma Coatings in Amsterdam, each team has its own laboratory for quality control and workers rotate between production and laboratory.
- Maintenance: to some extent in the 1960's Industrial Democracy experiment in a fertilizer plant belonging to Norsk Hydro (Thorsrud et. al. 1976: 437).; the SKF D3 bearing plant in Gothenburg (Hellstrand 1989, Sandberg et al. 1992: 81-82); Holec Hengelo; Sigma Coatings in Amsterdam.
- CNC programming: at Felten & Guillaume, machine operators take care of all CNC programming; at DAF Trucks, most of CNC programming takes place in the cells.
- Adapting CNC programs: Zahnradfabrik Friedrichshafen (ZF) (Schultz-Wild et al. 1986: 522); in case operators at DAF Trucks do not program themselves, they can at least adapt the programs that they use.
- Machine-setting and pre-adjusting: diesel engine factory of Klöckner-Humboldt-Deutz; DAF Trucks; Zahnradfabrik Friedrichshafen (ZF).
- Administration: Philips work structuring project in light bulb assembly. At Sigma coatings, in each product group there is an information assistant, who is responsible for updating the SAP information systems. This task rotates among operational workers who are suitably qualified. In 1993 ten out of the 200 operational workers had qualified themselves for this job.
- Logistics: Holec Hengelo.
- Repair work: the SKF D3 bearing plant in Gothenburg.
- Requisitioning components: SKF D3 bearing plant in Gothenburg.
- Financial tasks: in the Hotel Caledonien, waiters handled day-to-day economic control (Gustavsen and Hunnius 1981: 51-56).

- Training new employees: SKF D3 bearing plant in Gothenburg; Volvo Uddevalla.
- Dealing with internal and external customers. This happens to some extent at DAF Trucks and the Rietbergwerke.

A further opportunity is integrating development work into production work. It is useful to make a distinction between product and process innovations. In the Rietbergwerke, workers take part in product innovation. According to an evaluation report, a development group comprising workers from all echelons developed a new line of tanks for applications in environmental protection (Braun et al. 1988: 158). The contribution by workers on the shop floor to product development is the construction of prototypes. There is no separate department for prototyping; production workers make the prototypes themselves. Problems that become apparent lead to design changes. Sometimes they find, through handling the products, ways to improve the design. In 1993, forty out of a total of 64 workers had been involved in development work. However, the volume of development work on the shop floor is small. The plant manager estimates that, on the shop floor, about 300 of the 40.000 man hours per year consist of development work.

Further cases in which workers undertook development work dealt with process innovation.

In some cells in components manufacture at DAF Trucks, workers set up a kanban system (with outside help).

Operators in Van Nelle's tobacco unit faced the problem of occasional leaky seams in tobacco pouches. They invented a system that blows air against the filled pouches, causing leaky seams to open up. Photo cells detect this. The operators built this system themselves, against the will of technicians, who felt that it was their job to develop systems like this. A repairman designed and built an entire machine that is part of a packing line. This was against the will of the central technical department, which insisted that this was engineering work instead of maintenance. In the municipality of Emstal (Germany), there was an experiment in which clerical workers develop information systems.[66]

In assembly work, there is little evidence of process innovation by production workers. Even at Volvo Uddevalla, the car plant that represented the most radical departure from the assembly line concept, team members do not spend much time working out new methods. In 1990, the exact working method had not yet been determined, but there was a development towards regular procedures in which the "best" method was laid down.

Several initiatives enriched jobs through adding management tasks.

In Hotel Caledonien, waiters handled distribution of work, recruitment, leaves, rosters, shift plans and organization for the holiday season. In the work restructuring project in light bulb assembly at Philips,

teams handled distribution of tasks (Den Hertog 1975: 93-108). In the Vereins- und Westbank in Hamburg, teams plan the arrangement of work stations, job rotation, and holidays and overtime (Brater 1993: 8). In the SKF D3 bearing plant in Gothenburg production teams took on planning, budgeting, and measurement of productivity (Hellstrand 1989, Sandberg et al. 1992: 81-82). At DAF Trucks, the fact that there are workers on the shop floor who take on management duties, shows in the number of different pay grades on the shop floor. This number increased from two to four. Because the workers on the shop floor at Felten & Guillaume assumed planning and managing tasks, the number of workers in production increased, while the number of indirect workers decreased.

Management tasks on the shop floor level are typically connected to the position of team leader, coordinator, spokesperson or island leader. In some cases, this is a permanent position, limiting job enrichment through adding management tasks to one worker per team. At Sigma Coatings, each product group (i.e. team) has a product group manager and two shift leaders. These are assigned jobs that do not rotate. In other cases however, the leading position in the team rotates. At Felten & Guillaume, workers can move up to the position of island leader, but this depends on their qualifications. Theerkorn (1991: 192-193), who played an important part in the change process, notes that these qualifications are not attainable by many workers. At Felten & Guillaume, the job of island leader is comparable to the job of foreman ("Meister").

In Volvo's Uddevalla plant, there were no foremen. Each team member was eligible for it. The spokesmen took part in production meetings at a factory level. There was disagreement between management and unions on the number of employees per team eligible to assume the role of spokesman. Management wanted this restricted to four or five per team; in the union opinion, as many as possible of those who were able to perform that function should also be entitled to do so.

At IHC, management wanted to have two permanent coordinators per team. The works council was opposed to this and felt that the role of coordinator had to rotate among team members. The works council convinced management that this was the way to do it. Each team had two, three or four persons who can take on the coordinator role. They are renumerated for their availability. At IHC, coordinators have no authority to issue commands. When they cannot solve their problems with coworkers, they have to take the matter to the manager. The team elects the coordinators, but the manager can take away someone's coordinator status, if he does not set a good example for his coworkers.

Apart from this, there are no strict rules that prescribe how a co-ordinator must operate. Rotation takes place every two of three months, that is up to the team, as long as the job gets done.
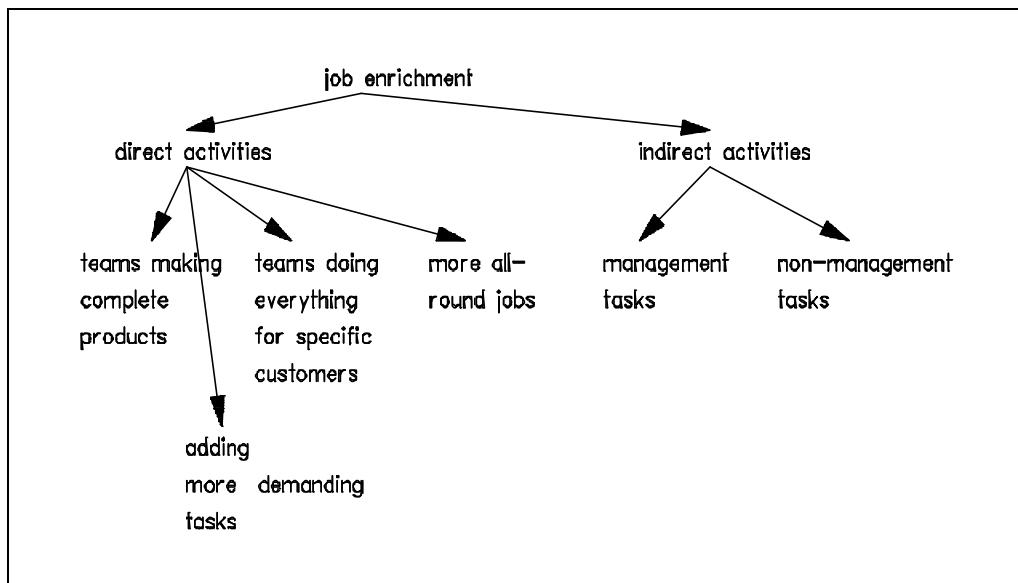
Fig 5. 3 Job enrichment

5.4 Decentralization of responsibility to the shop floor level

Intimately linked with job enrichment is decentralization of responsibility, which involves granting of autonomy to workers. Some writers (Bamforth and Trist 1951, Friedman 1977) use the term "responsible autonomy" for this.[67] Several levels of autonomy can be distinguished, like the autonomy to decide about:

- working pace;
- sequence of operations;
- methods;
- goals.[68]

A way to organize decentralization of responsibility is to create semi-autonomous groups, each working at a more or less complete task. Semi-autonomous groups institutionalize horizontal coordination.

Cases exhibit three types of decentralization of responsibility (Fig. 5.4). In some cases, decentralization of responsibility to the shop floor level takes the form of delegation of detail planning. In as far as this makes the job more complex, this represents job enrichment as well:

- At tin can factory TDV in The Netherlands, the logistics department used to plan production on a day-to-day basis. After the changes, they make a weekly planning.
- In the island concept at Felten & Guillaume, planners are not concerned with intermediate steps. Detail planning takes place in the production islands. (It is not necessarily machine operators who perform this detail planning.) For example, in the manufacturing of cable eyes, this detail planning includes: planning the order of operations; deciding who

should make the CNC program, optimizing methods and processes; organizing maintenance of machines; checking if maintenance takes place in time; deciding whether it is possible to perform all production steps inside the island (Theerkorn 1990: 193-195). An evaluation study revealed that, after the change, there was somewhat more freedom to determine the order of operations (Simon 1992: 43-44).

- At Holec, work preparation, CNC programming and rough planning takes place in the office, but team members do detail planning - only reporting back when the product is finished.
- At Sigma Coatings, planning is decentralized. This planning entails the order of operations. However, since the weather determines demand to a large extent, not too much planning is possible. The main thing is to keep lead times as short as possible. Apart from product group managers and shift leaders, operational workers play a part in planning. In 1993, thirty per cent of the operational workers had been involved in planning.
- In Van Nelle's tobacco unit, one of the teams (a team that does hand-packing of special orders) plans its own activities within a one week time horizon.

A second form is decentralization of the authority to take action when problems arise:

- Workers at Felten & Guillaume can, after consultation with Logistics, independently choose alternatives, when the materials in the parts list are not available (Simon 1992: 44-45). In case of a breakdown, they can call the maintenance department directly and assist the repairman, instead of reporting the disruption to the supervisor.
- The IHC shipyard confines this responsibility to the team coordinators. They act as troubleshooters. A former coordinator says: "In the old situation, you took problems first to the supervisor. Then he would eventually call in the production office or the quality department. One could distinguish supervisors because they wore yellow overalls, common workers wore blue overalls. If you, wearing a blue overall, walked into the production office, you would get odd looks. They really had to get used to workers in blue overalls having re-sponsibilities."
- In the Halmstad County Hospital, there exists a list of drugs that nurses can give without a doctor's prescription. When a patient is in pain, the nurse can decide to give, for example, an injection. She has the patient's medical records and there she can find which drugs are allowed. Previously, something like this had to go through the head nurse. Now nurses can determine whether a blood test or an infusion is necessary.
- At DAF Trucks, teams decide for themselves about the things they want to improve. "We advise managers to endorse this choice at all times", say A. Coppens, "unless it clearly goes against the interests of the

company. The team's choice is a measure for what they feel is important. When a manager has emphasized that productivity must go up, and the team did not chose this aspect for improvement, then he knows that his message did not come across." The improvement procedure further involves defining how to measure the results and measuring before and after implementation of the solution.

Apart from these relatively clearly defined forms, one finds a general reduction of supervision density. In one of the Philips work structuring project foreman's positions were eliminated. Workers became more responsible for quantity and quality of output (Philips 1968: 33-35). The LOM project in the Tomteboda post terminal introduced delegation of planning and allocation of work to workers (work groups). Groups became responsible for filling places that were vacant because of short-term sickness. In the customs area, foreman's functions disappeared, groups assumed budget responsibility (Naschold 1992b Anhang C: 108-125, Gustavsen, Hart & Hofmaier 1988). At DAF Trucks and Volvo Uddevalla, and in the pilot projects on teamworking at Mercedes-Benz in Bremen, teams work(ed) without supervisors or foremen. At Sigma Coatings in The Netherlands, there had previously been one supervisor for every five workers. After the change, there was one supervisor for every ten workers. In this plant, team leaders function as supervisors, but they normally are only present during the day shift, leaving coordinators some leeway during the late shift. At Holec, team members spend the greater part of their time without direct supervision, since supervisors have a span of control of four teams.

In the Halmstad County Hospital, in which teams of three nurses and three assistant nurses are responsible for their own seven patients, workers actively defend their autonomy.[69] There are signs of an emancipation process of nurses in respect to doctors. A head nurse comments:

> "I teach the nurses that doctors are not gods, that you can ask them things and give them your opinion."

A doctor:

> "Before the changes, you had more power, you could just say do this and do that, now the round takes more time."

It happens that work teams achieve such a level of autonomy, that the labor process becomes a black box for management. To the workers, this can be a source of power.[70] This occurred in the IHC shipyard. A personnel official explains:

"The teams in final assembly [of ships] work most independently. Often, customers come directly to them. They like to mount things before management knows about it. That the boss says 'but it cannot be mounted yet' and that they can say 'but it is already in place!'. Management lost track of what they are doing. They exploited this position already twice by threatening to strike, with the argument that they had taken over tasks that once were part of much more well-paid jobs. They got their pay raise. Managers accept their independence because things are going so well."

The possibility to obtain autonomy depends on the type of work, or more precisely, on the way in which systems boundaries are drawn. In IBC's pipe-making department, for instance, the labor process offers little opportunity for decision-making.

Decentralization of responsibility implies that management accepts that workers implement the organizational changes at their own pace and in their own way. "When you lay responsibility at a low level in the organization, you must not push", says Piet Wemmers of IHC: "If you do, you breed resistance, you have to allow them time." One of the teams in the IHC machine factory has no coordinators, they were happy when they got rid of their bosses. They did not participate in the courses that were part of the project "Working Differently". Management accepts this, since their performance is on a par with the other team in the same workshop, that did participate.
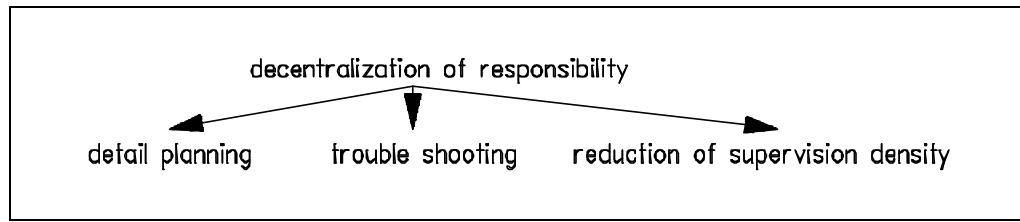

Fig 5. 4 Decentralization of responsibility

5.5 Participation

Introduction of real participation is the third aspect of strategies for breaking away from Taylorism.

A convenient way to approach the definition of real participation is to distinguish it from pseudo-participation. We can distinguish two types of pseudo-participation: strategies to foster worker commitment to management plans (Pateman 1970: 68-69) and on the other hand "vampyrist" (Blume 1993: 583) participation designed to extract information that is valuable for systems development. Someone is involved in real participation if (irrespective of the formal arrangement, for example,

consultation, negotiation, joint project groups, veto powers or not) the locus of decision-making (about matters that transcend the boundaries of his or her primary task) is at least partly inside his or her head.

Quality circles are a common form of participation (see Fig. 5.5 for a small catalogue of forms of participation in the workplace). Siemens started in 1979 with quality circles. Before 1986 there were 600 of these circles. Klingenberg and Kränzle document a case in which a quality circle provided a real solution for a real quality problem. (This problem had to do with the production of cables. The production required temporary connectors. When it was time to remove these connectors, there was a tendency that some would remain unnoticed. Klingenberg and Kränzle 1986: 91-104). Participating in a quality circle does not change the predetermined nature of the job (Stekelenburg and Warning 1983: 218). A. Coppens of DAF Trucks experienced:

> "With circles alone you do not change much. When the work is of type X and the circle is an activity of type Y, then the enthusiasm for the circle diminishes if the rest of the work remains of type X."

A different form of participation is participation in design. An example is the Volvo engine plant in Vara, in which workers participated in the designing right from the start (Forslin 1992). One of the goals for the change project in the Rietbergwerke was to supplement representative participation with direct participation. Both forms were not to compete with one another, but to mutually enhance one another and to get intertwined. Participation took place in planning groups, chaired by action researchers. Subjects were factory lay-out, design of machinery and the organization of work. In the LOM project in the linoleum and vinyl floor covering factory Forbo-Forshage in Gothenburg, operators participated in the choice of new technology and in the decision-making about this (Naschold 1992b Anhang C: 1-27).

Information systems tend to undergo continuous development, allowing participation in design to become structural. A case in which this happened to some extent was the development of the PROSOZ system for the social security service in Bremen.[71] This case is also interesting because it was possible to trace the effects that participation had on the design. There were two forms of participation: through the employee council (participation by representation) and through a project group. The employee council demanded that workers would not have to work on their personal computers for the whole working day. This stand led to a final agreement that half of the working day should consist of non-computer work. To achieve this, one procedure (support obligations towards dependents) was deliberately not automated. Furthermore, some

calculations were left out of the system. The officers would perform these by hand, then enter the results into the information system.

Another way to cut down on VDU-related work was to decide not to put technical and juridical reference material on-line. Other points in the agreement were:

- the system should not collect data on worker performance;
- users should have more workspace (fourteen square meters) than in the old situation (ten square meters).

The second form of participation in this case was through a project group. Eighteen social security officers participated in this group. They tested prototypes, and exerted a traceable influence on the design. This made the system more practical. The first version that the developers came up with was more or less a translation of the law. The result was that users needed to wade through several layers of menus to reach commonly used functions. An example is the function "unemployment", which is most frequently used. To the dismay of the users, at first, the designers buried this function deep into the menu system. The project group changed this completely. In the newer version, commonly used functions are readily accessible. Function keys allow rapid changing between functions. There is a summary screen for the case in question from which all functions are accessible and which show markers for aspects already dealt with.

The first version of the program decided whether or not the applicant's rent was appropriate, considering family size and the average level of rent in the district. The members of the project group felt that it was the task of the officer to take decisions like this, so they dropped this feature from the program.

A further indication for the significance of the participation in the project group is that developers continue to ask them to provide input during the further development of the system. Also, the former members of the project group have taken on a part-time supportive role, helping their coworkers to cope with the new system. In this case, it is fair to say that there was structural participation, but only for eighteen workers out of a total of 360.

A paradoxical point, however, is that through participation the system improved so much that other cities adopted it. By adopting a ready-made system, these cities denied their social security officers the opportunity for participation that their colleagues in Bremen had.

An entirely different tack in the area of participation is the establishment of a democratic structure. This is the focus at car retailer Opel Hoppmann in Giessen (Germany). In this firm emerged, via several intermediate steps, an alternative decision-making structure parallel to the traditional management hierarchy and the works council. It was the explicit intention that this form of worker participation should not compete with co-determination through the works council and the trade union.

The "Company Committee" (Wirtschaftsausschuß) became the highest decision making body. The Company Committee is a body that is required by law. It normally has an advisory role vis-a-vis the entrepreneur. The Company Committee is a joint committee. The works council and the management choose four members each. The chairperson is neutral and has to be acceptable to both sides. The Company Committee has a say in matters like the sales and investment programs, larger investments, plans for rationalization, financial commitments over a certain threshold level and organizational changes.

The second level in this structure consists of work-groups. Each worker is a member of a team of seven. From their midst they choose a spokesperson. The work groups enjoy information rights and the right to be heard in matters like changes in modes of operation, redesign of work places and transferal of personnel. Work-groups have veto powers in decisions about hiring workers after their trial period.

Work-groups can take initiatives as well. For examples: buying, installing and changing technical equipment; in one of the branches there was an initiative to change the division of labor between the "Meister" (first level supervisor), his deputy and the group; the painters' group took the initiative to have their health risks assessed.

The change process shows care to avoid pseudo participation. This was the reason for instituting parity in the Company Committee. Hoppmann and Stötzel write:

> "Workers see through bogus democratic procedures. These lead to irritations. The only way to deal with mistrust vis-a-vis forms of participation, that have been installed from above, is with openness, by making the company affairs transparent." (Hoppmann and Stötzel 1981: 185)

The owner "neutralized" the firm's capital by irrevocably handing over 98.5 per cent to a newly created foundation "Democracy in Everyday Life". This foundation finances activities for the benefit of disadvantaged children and youths. One of the reasons for creating this foundation was to progress further along the path of worker participation:

> "It is [..] a piece of evidence to show that we are serious in our efforts for democracy in the workplace, and that we want to dissociate ourselves from all attempts to create a pseudo-democracy." (Hoppmann and Stötzel 1981: 38)

Another reason was to ensure continuity by sheltering the firm's capital from the whims of future private owners.[72] A third reason was to reduce the dependence of the participation model on the person of Klaus

Hoppmann (many had expressed doubts about the viability of the model without the personal involvement of Klaus Hoppmann).

When Klaus Hoppmann proposed introducing semi-autonomous groups, the employees blocked this. This testifies to their real influence.[73]

In the county hospital in Halmstad, the change process brought a participatory culture rather than participation channeled through democratic structures. Nurses have, albeit limited, influence on treatment. Every day, doctor, nurse and assistant nurse discuss their patients. (Assistant)nurses can contribute useful information, because they know the patient well. A head nurse notes:

> "The nurses can look critically at drug use and ask themselves if so many pills, expensive as they are, have any effect at all. Whether you can say something like that to a doctor depends on how you say it. A sense of humor is important."

Another head nurse indicates that it is up to the doctor how deep this involvement can be:

> "You might discuss alternative treatments with the patient, but .. there are doctors and then there are doctors. A young doctor will ask the nurse anyhow 'and what shall we do now?'."

Similarly, workers at Sigma Coatings feel that their opinion matters: "Previously, the engineering department provided transportation carts. In practice, these were often not handy. Now they first ask you, what you want". When management plans an investment in a production line, they ask workers for their opinion. One worker found it very striking that, when he is working at some machine, it happens that someone calls him with a query.
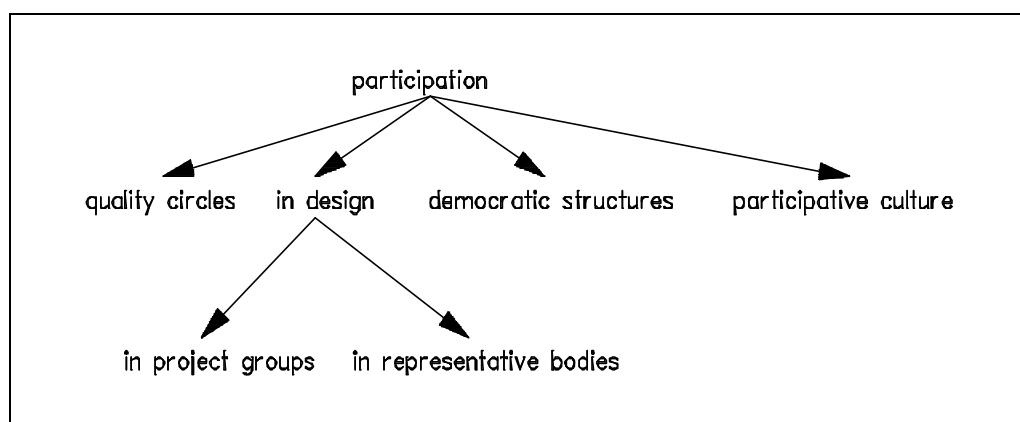

Fig 5. 5 Forms of participation

5.6 A note on prevention

The issues dealt with so far in this chapter, alleviation of technical discipline, job enlargement, job enrichment, decentralization of responsibility or participation are all ways to change existing situations. On the other hand, there were a few initiatives, in which there were elements that focused on preventing further Taylorization.[74] For example at DAF Trucks, the personnel department tries to prevent impoverishment of jobs as a result of technical change. One of their instruments is a database in which they record sociotechnical solutions for various problems, which they gather from the literature. When presented with a plan for technical change, they can retrieve design options from this database. Another of their instruments is a computerized questionnaire, designed to assess the quality of working life. Its output consists of thermometer-like graphs, showing among other aspects, the score on an autonomy scale. The personnel officers use this program to evaluate the quality of working life before and after technical changes. It is customary for staff from the personnel department to be involved in technical change. A. Coppens explained:

> "It has even occurred that we had a project canceled. A technology aficionado wanted to deploy a welding robot at the certain point. In this way, the skilled work would be automated, leaving only a totally impoverished job. We told him 'Who do you think you are going to put there? You can better automate the loading and unloading.' [..] It proves to be very important for the quality of working life to work preventively. When the investments have been made, you can at best make little adjustments to make the work somewhat nicer."

The two other initiatives that had a preventive aspect involved agreements not to use information systems to track errors down to individual workers.[75]

5.7 Success and regression

Most consensual initiatives met with some degree of success. In 72.6 per cent, the initiators completely realized their plans. In another 16.1 per cent of the cases, the original ideas were only partly realized. In 8.1 per cent of the cases, there was no change at all in the organization of work. There may have been changes in working conditions, like a reduction of physical strain, but this type of change lies squarely outside the scope of the present study. In terms of a movement away from Taylorism, these cases did not progress beyond the phase of ideas. None of the five basic issues: alleviation of technical discipline, job enlargement, job enrichment,

decentralization of responsibility or participation is excluded from this success.[76] Impact rates for the respective issues show this. (For example: the impact rate for participation is the percentage of the attempts to establish participation that were to some degree successful in making an impact on the organization of work.)

Here, "impact" means that there was at least some traceable effect.
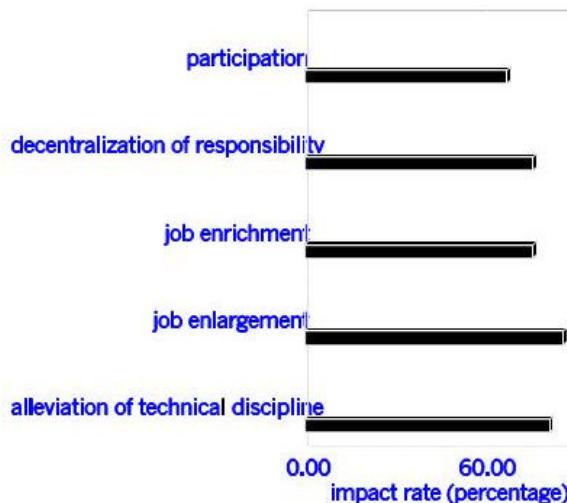
Fig 5. 6 Impact rates per issue

However, in many cases, the initial success did not last. In these cases, regression to more Tayloristic ways of working occurred. Of all the cases in which the initial plan was realized, regression in some form or another occurred in 35.6 per cent. In 55.6 per cent of the cases, I could not determine whether or not there had been a regression. In just four cases, 8.9 per cent, it was clear that no regression occurred, at least not in the indicated time frames. These cases were the Social Security Service in Bremen, Germany, 1987-1993; the Volvo car assembly plant in Uddevalla, Sweden 1988-1990 (closed down in 1993); the County Hospital in Halmstad, Sweden 1980-1992; Opel Hoppmann, 1961-1981 (in 1990, the democratic structure was still in place).

In some cases (Sigma Coatings, DAF Trucks, IHC Holland) regression was merely a dip in a development away from Taylorism.

Regression to more Tayloristic ways of working can occur in a variety of ways. In industry, buffers and arrangements like dock assembly that shield workers to some extent from mechanical pacing, risk being eliminated. Early in the eighties, Volvo Kalmar took steps towards rationalization. The method of dock assembly was abandoned (Agurén et al. 1984: 41). Buffers between the sections also disappeared, with the exception of the buffers that were deemed necessary in connection with the inflow of components. Thus, most of the deviations from the assembly-line principle were abandoned again. The most important difference that remained was that the workers could still follow an AGV on its way through the subsection, which allowed for a maximum cycle time of 25 minutes (Berggren 1989: 183).

Relatively high-level tasks that enrich jobs are at risk too. At Van Nelle, one of the work groups used to receive incoming tobacco, to check its quality, to mix it and to add flavoring. Eventually, however, the management of the parent company moved the quality control work to the buying department. A shortage of skills can have the same effect. A manager at Holec says:

> "[Team structures threaten] people who had for years been pushing themselves to their limits. All of a sudden they had to organize, to read and to write. And people who knew their work technically like the back of their hands, who were used to going to work every morning, who were completely confident that no difficulties would come up, all of a sudden had to rotate jobs. For such workers there was no relief. Actually, one would have to talk to workers of over forty years of age separately, to impress upon them that they have to make themselves receptive ('kwetsbaar'), if at least they know what that means.
> People have fallen ill because of the demands that we put on them. Men who skillfully operated the same machine for years, who were the petty boss over that machine, and who were its best operator, got fear of failure when they had to do organizing work. Now we no longer assume that everybody has to do organizing work. [..] A collective sigh of relief went through the teams. Many members had suffered fear of failure. Someone is really in trouble when everybody thinks that he is a master craftsman, and then it turns out that he can't read."

Reintroduction of supervisors can seal the fate of a declining decentralized responsibility. Ten years after the start of the change project, management reintroduced foremen in the Rietbergwerke.

Box 5.3 Social tension on the shop floor can lead to regression

Responsible autonomy can lead to social tension on the shop floor. Rotating coordinatorship can put workers in the uncomfortable position where they have to give orders to fellow workers, who in turn would be in the same position. After years of trying to work with rotating coordinatorship, the Rietbergwerke reintroduced foremen ("Meister"). In the beginning, the system of rotating coordinatorship system worked well. Workers proved that they were up to it. But soon problems arose, when coordinators had to take unpopular decisions. When the person affected by such a decision would later take over the coordination role, he would get back at the previous coordinator. For this reason, coordinators grew ever more careful and more reluctant to make decisions. Besides, cliques formed that picked the best pieces of work for themselves. A manager: "This led to tensions that the workers took home with them. The former coordinators were not angry when the system was abolished. They were taking the conflicts home with them, and deep down they felt relieved. But the job enrichment was gone. For years we had tried to hold on to the coordinator system, but the mood worsened and worsened. The works council, too, felt that it could not go on like this. The abolishment meant a drop in pay; coordinators were making 200 marks per month more. The collective agreement, after the project had been extended to three of four years, was canceled."

Employing foremen ("Meister") was expensive, but management and works council felt that there was no other choice, due to the inefficiencies caused by the social friction on the shop floor.[77]

Finally, within semi-autonomous teams, a division of labor can crystallize that again separates conception from execution. This happened in six cases.

A report by the Philips works council mentions as one of the problems with work structuring projects, that informal group leaders become bosses (Philips 1973: 7). The ECT home container terminal exhibited segmentation inside the work groups as well. At Van Nelle, organizing tasks eventually concentrated on the coordinator. According to a Van Nelle manager, one of the coordinators acts as a foreman: "He formed inside his work group a Tayloristic bunch, of which he is the foreman."

Having a large proportion of temporary workers in a team is conducive to regression. In the shipbuilding units of IHC, more and more work was done by temporary workers; in some teams the proportion came close to 100 per cent. This caused team coordinators to act as bosses. It can happen that one welder, assisted by temporary workers, puts a whole section together. Reliance on temporary help is a cornerstone in IHC's policy to maintain flexibility. Thereby, management puts up with the risk that it threatens team structures.[78]

The members of one of the teams in the IHC machine factory find that they can not take the burrs of workpieces, because they have to attend at their machines permanently. Therefore, they have a special person around who does nothing but removing burrs.

In the production islands of Felten & Guillaume, one finds unskilled workers ("Ungelernte"), semi-skilled workers ("Angelernte"), skilled workers ("Facharbeiter") and foremen ("Meister") working together. Within the islands, there develops a division of labor between these categories of workers. Moreover, skilled workers tend to hold on to qualified work. For example, a worker who had, as part of the change project, learnt CNC programming had to make a stand to be allowed to practice his newly acquired skill.

In the final analysis, decentralization of responsibility implies granting workers the right to create Taylorist structures. From this dilemma there is no easy way out.[79] The tendency for managers is to tolerate it as long as it seems efficient. "One of the coordinators is a complete leader who gets involved in everything," says a manager at Van Nelle: "When you say, 'Now it is time for you to work at a machine, you have to rotate too', he does not like it a bit. It is hard to come to a good judgment about this. I am reluctant to make an inroad upon the informal organization. You strongly reduce somebody's motivation if you take away his status."

The occurrence of regression on this scale makes it very difficult to see anti-Taylorism exclusively as modernization. If anti-Tayloristic change adapts organizations closely to their increasingly fluctuating environment, regression would be an unlikely outcome. Regression is more compatible with the view that anti-Taylorism is one of the fluctuating ways of coping with the immanent tensions produced by the employment relationship.

5.8 Contingencies reveal vulnerability

Contingencies like mergers, restructuring, resignation of key persons (both managers and union officials) and financial troubles can kill or damage initiatives, or cause regression. A 1960's experiment with increased worker responsibility in a carpet factory in The Netherlands (Hatéma) collapsed when the experimental department disappeared following a merger (Ramondt 1975: 92-95, Ramondt 1968). In Norwegian metal working company Nobø participating in the Industrial Democracy program, change activities dwindled when management moved production to another location (Thorsrud et al. 1976: 434-436, Bolweg 1976: 64-65). A factor in the stagnation of the Industrial Democracy experiment in the Norsk Hydro fertilizer plant was the departure of the key union leader and secretary (Thorsrud et al. 1976: 436-438, Bolweg 1976:

65-70). A study, conducted seven years after the beginning of engine assembly at Volvo's Skövde plant, showed that the concept had not developed after the first year and that there had been a regression. It turned out that success was dependent on visionary managers. When they left, traditionalists took over (Forslin 1992: 13). In the 1990's, a renewal of management hampered the development of a LOM project in a steel plant (Naschold 1992b Anhang C: 76-90). In 1987, DAF Trucks had a reorganization of management. Before this, a single manager was in charge of both production and development. The reorganization separated these responsibilities, causing management support for the new way of working to diminish. Furthermore, increasing production (up to ten percent per year), the takeover of British Leyland and the introduction of a new logistical system, all took management's attention away from developing the organization of work. Finally, in 1990, Womack, Roos and Jones published "The Machine that Changed the World". "Jones was invited to elaborate on the study", said A. Coppens, "and with the functional managers the idea of lean production was a huge success." However, he added that "in the meantime many things had changed on the shop floor that could not be undone".

At the stevedoring company Swarttouw in Rotterdam, job enrichment activities were under way, when it merged with GEM (Graan Elevator Maatschappij). At GEM, there were no planning or organizing tasks at the operational level, but wages were higher than at Swarttouw. When given the choice between the Swarttouw collective agreement and the GEM collective agreement, the Swarttouw workers chose for the higher wages, giving up the prospect of job enrichment.

Financial troubles slowed down the change process in the Halmstad County Hospital. A planned reduction of the bed capacity left employees worried about their jobs. In the social security department of the city of Bremen, cuts in government spending delayed implementation of the new system.

Technological change by itself can lead to regression, even if the new technology is appropriate for non-Tayloristic organization development. Sigma Coatings' new plant in Amsterdam represents a jump from the middle ages to the late twentieth century. Closed installations with computer controlled hoppers, valves and grinding machines replace age-old messy manual processes. Operators control production from consoles that are located on the shop floor. Running a Microsoft Windows based application, the consoles display a schematic of the current process. It is possible to display a recipe for the product in a window. However, the transition to this completely new technology sent the workers on the organizational level back to square one.

This vulnerability to all kinds of contingent obstacles indicates a weakness in consensual alternatives.[80]

5.9 Diffusion

Diffusion did take place, but the extent was often disappointing for the people involved in the change process.[81] In 11.7 per cent of the cases, there were signs of diffusion from the kernel, where the process started, to other places inside the plant, to other plants belonging to the same company, or outside the company.

In several cases, the initiators found themselves in the paradoxical position that there was large external interest in their initiative, while at the same time interest from other parts of their own organization was lacking.

An example is the tobacco unit of Van Nelle, a textbook case of a shift away from Taylorism. The coffee and tea units, housed in the same building, do not show interest in the new organization of work, that developed in the tobacco unit.

Outside interest has often been great. In the 1960's, the Industrial Democracy experiment in the Nobø metalworking plant in Hommelvik attracted attention from the media and from other companies, especially from Sweden (Thorsrud et al. 1976: 434-436, Bolweg 1976: 64-65). The experiment in the Norsk Hydro fertilizer plant drew many national an international labor and management visitors (Thorsrud et al. 1976: 436-438, Bolweg 1976: 65-70). In a 1973 evaluation of work structuring, the Philips works council reports that visitors from all over the world came to see the projects (Bolwijn et al. 1973: 5).

Interest in consensual alternatives did not wane over time. More than a decade later, the change project of Felten & Guillaume received 1500 visitors (Theerkorn 1990: 49). Around 1990, many came to Uddevalla.

5.10 Conclusions

Braverman (1974: 29) made the following judgment about workplace reforms:

> "They represent a style of management rather than a genuine change in the position of the worker. They are characterized by a studied pretense of worker 'participation', a gracious liberality in allowing the worker to adjust a machine, replace a light bulb, move from one fractional job to the other, and to have the illusion of making decisions by choosing among fixed and limited alternatives designed by a management which deliberately leaves insignificant matters open to choice."

The organizations that figure in this chapter go beyond changing the style of management. Especially in those cases that entailed job enrichment, there was a transformation of work content. But this transformation was not so profound as to help the beneficiaries break out of the framework of industrial production or bureaucratic organization into craft production or professional work. Nevertheless, limitations became apparent:

a) Some initiatives failed to have an impact (eight per cent failed completely, sixteen per cent failed in part). This point becomes more significant due to the fact, that the cases that make up the data base for the present study were not a representative sample of companies. The set of cases must rather be seen as part of the vanguard of anti-Tayloristic change.

b) In some segments of working life, anti-Tayloristic initiatives seemed non-existent (in terms of jobs: supermarket checkout clerks, fast food, bank tellers, in terms of technology: there were no alternatives for computerized disciplining systems).

c) Initiatives tended to remain isolated alternatives; clear examples of diffusion were scarce. In eleven per cent of the cases, there were signs of diffusion. In several cases there was no diffusion inside the plant in which the initiative took place.

d) Regression to more Tayloristic ways is a common phenomenon.

e) Consensual alternatives prove vulnerable to various kinds of contingencies like mergers and the departure of key managers.

This corroborates the conclusion of the first chapter, that Taylorism is a persistent phenomenon.

It may seem compelling to comfortably stay inside the enlightenment paradigm. There are promising results, and ample opportunities for further elaboration by pointing out that not enough attention has been paid to factors "X". "X" might be something like: participation, management commitment, culture, (a certain deep level of) communication, organizational learning, parallel learning, n-th-loop learning, an integral approach, sociotechnical design, flow-oriented design, a process oriented approach, chaos, complexity and so forth.

However, the ideal of value-freedom requires us to look beyond this paradigm. This mean that we have to explore how constraint variables affect the de-Taylorization process.

CHAPTER SIX MANAGEMENT POWER AS AN OBSTACLE TO CHANGE

6.1 Introduction

A well known theory holds that in company decisions, control over labor is an explicit criterion alongside economic rationality (Van Klaveren 1994: 24).

Box 6.1 "What Do the Bosses Do?"

Marglin (1982) extensively criticized the dominant view that improving efficiency was the main driving force in the genesis of the factory system, with its capitalist hierarchy that denies self-expression to the majority. According to his analysis, workers first lost control over their product. The mechanism for this was a division of labor in which workers specialized in a small step in a production process. This precluded that the workers could produce marketable products on their own, and gave the capitalist an essential role to play, that of integrating production and acting as an intermediary to the market. Marglin argues that Adam Smith's example of a pin factory was wrong. Smith may have been right in claiming that separating the steps in pin production, like drawing wire, straightening it, cutting it, pointing it etc. boosted efficiency by reducing setting-up time. But, in contrast to Smith, Marglin (1982: 292) does not conclude that workers should specialize in one of the production steps: "A workman, and his wife and children, could have proceeded from task to task, first drawing out enough wire for hundreds or thousands of pins, then straightening it, then cutting it and so on with each successive operation, thus realizing the advantages of dividing the overall production process into separate tasks."

Surviving wage records of an early 19th century pin factory indicate that no great skills were required, which otherwise might have necessitated specialization.

After losing control over the product, workers lost control over the production process when they were gathered into factories. Marglin asserts that, in contrast to conventional wisdom, the use of water and steam power was only secondary in importance to the enforcement of discipline.

To what extent does *control as an end in itself* constrain the development of consensual alternatives? This is the guiding question for this chapter.

In the literature, we find many analyses that would lead us to believe that a constraining effect of control as an and in itself will not be

prohibitive. Generally, the foundation for these analyses is a non-zero sum and multi-layer concept of power. Giddens (1979: 93) provides a definition of power that conforms to this concept: "The capability of actors to secure outcomes where the realization of these outcomes depends upon the agency of others."

A non-zero sum and multi-layer concept of power opens the way to realize that in anti-Tayloristic initiatives, only a specific kind of control is given to workers. This "dependent control" is very different from "independent control", which means that "the workers' side does actually exert an independent force" (Goodrich 1975: 257). Managers grant detail control to workers and reserve general control for themselves (Edwards 1990: 145).

Howard (1986: 116) notes that: "There is a world of difference between being allowed to control certain limited areas of working life defined entirely by the norms and decisions of others, and having the influence actually to shape the scope and the content of those norms and decisions themselves."

Many writers employ the notion of hegemonial control, that is control without conflict or manipulation, which is embedded in everyday commonsense understandings of reality. Doorewaard (1989: 132) asserts that, what managers lose on the hierarchical level, they can more than recover on the hegemonial level. Child (1985: 127) states that a management strategy to make workers more "polyvalent" emphasizes the "consensual and positive" side of the employment relation.

For managers, a last line of defence is the employment relation itself. The dependency on the employment relationship is a factor that tends to keep workers in line (Kalecki 1972: 424, Littler and Salaman 1982: 261), especially when there is a lack of alternative employment opportunities.

On the multilevel chessboard of power, managers do not easily run out of options. They can pursue strategies to "manufacture consent" (cf. Burawoy 1979), increase organizational transparency and use computer-based control systems (Van Klaveren 1984: 50, Rolf 1989: 90). Furthermore, they can introduce new "bureaucratic controls". Bureaucratic control (Edwards 1979: 112) is based on rules, detailed job descriptions and institutionalized talks with unions. Bureaucratic control is generally applied to the employees who are central to the company and hard to replace. An example of a new bureaucratic control, created with de-Taylorization, is a rule that workers must participate in job rotation to be eligible for promotion (ECT container terminal in The Netherlands).

In some respects, anti-Tayloristic change might even strengthen management control. Child (1985: 127) points out that "polyvalence" increases the worker's dependence on the internal labor market, since opportunities for learning are defined in terms that are specific for the

organization; letting workers perform complete tasks makes it easier to locate responsibility for errors.

In Chapter Three we have seen that Taylorist patterns may provide workers with the opportunity to create a specific kind of autonomy. Anti-Tayloristic projects change this, to the extent that they entail, as Willis (1977: 182) noted: "the ordered internalization - on conditions - of the foreman into the informal culture which otherwise anarchically usurps and challenges his role."

Finally, anti-Tayloristic job redesign offers managers a convenient, pleasant vocabulary to discuss policies that might adversely affect worker's interests. Doorewaard (1989) gives a few examples: talking about participation instead of speaking about opening the black box of work processes; emphasizing all-round jobs instead of automation. Beirne and Ramsay (1986) assert that job redesign can be a "manipulative device" in work intensification drives.

6.2 Power related constraints in consensual alternatives

This sections presents information obtained by scanning the cases of consensual alternatives for indications of power-related constraints. Because the present study is based on cases of organizations in which anti-Tayloristic policies are implemented, it is impossible to completely answer the question whether managers in general are in favor of or against anti-Tayloristic change.

Results

In eight cases out of 61 (or 13 per cent) there were indications that power holders obstructed the change process because they held on to their power. In two cases, this proved fatal to the change initiative.[82]

In the two fatal cases, the top management halted further development of consensual alternatives. In these two cases there were merely indications - nothing more than that - that top managers, after experiments with non-Tayloristic structures, became afraid for their power positions.

A German state official, who had been involved in the 1970's Volkswagen experiment with complete engine assembly, maintained that the real reason for Volkswagen management to keep semi-autonomous groups a temporary thing, was to preclude that production knowledge came exclusively in the hands of the workers. In principle, this would have enabled new forms of strikes.[83]

At Felten & Guillaume, top management canceled a second humanization project, although the first project had been successful and a grant for the second project had already been awarded. Reasons for this

decision were not given, but the autonomy of project staff may have been a threat to top management. Because of the external funding of a large part of their work, the project staff had become more independent. Furthermore, the project staff gained external recognition and fame.

Thus, we can not rule out the possibility that there is a section of top management that, for reasons related to the maintenance of management power, wants to block anti-Tayloristic developments altogether. (In a way, however, top managers even stand to gain from anti-Tayloristic change. By making the organization flatter, they can eliminate competing lower-placed managers.)

In the other cases that exhibited power-related constraints, the effect was not so drastic as to block anti-Tayloristic initiatives completely.

In some of the cases, middle management limited the extent of worker empowerment. Decentralization of responsibility to the shop floor level and participation threatens middle and lower managers most directly. A middle manager at Sigma Coatings recalled his experience:

> "All of a sudden, the situation was such that you had to hand over an immense amount of knowledge and skill, and that you received little in return. Then you feel like standing still, if you can't get involved in new things."

Middle managers feeling threatened can cause a change project to slow down or stagnate.[84] The Norwegian Industrial Democracy projects in the 1960's had their share of these problems. In the experiment in the Norsk Hydro fertilizer plant, supervisors and middle management felt that their traditional roles were threatened (Thorsrud et al. 1976: 436-438, Bolweg 1976: 65-70). In the experiment in the Hunsfos pulp and paper mill, resistance by foremen caused one year of standstill (Bolweg 1976: 60-54, Thorsrud et al. 1976: 431-433).

The democratization process in the car retail firm Opel Hoppmann made supervisors unsure about themselves. In the course of 1972, it became clear that they felt threatened. But according to Hoppmann and Stötzel (1981: 58-63), later they learned to handle the situation in which they enjoyed less authority and had to depend on their professional knowledge. However, supervisors continued to exhibit braking behavior.

At the IHC shipyard in Sliedrecht management tried to achieve a similar shift to team working as in Kinderdijk. However, in Sliedrecht, the former bosses were appointed as team coordinators. On paper, management created a new organization, but in reality not much changed. The former bosses were used to doing the allocation of work and to check on lead times. After the change, they had to relinquish their old activities and to start guiding their teams. However, they clung to their old positions.[85]

In its evaluation of work structuring projects, the Philips works council found that lower managers felt threatened. When they were not moved to other positions, they fell back into their old role (Philips 1973). Reflecting on an experiment in participation, Fricke (1983: 84, 1988: 277) described the division between execution and conception as an uncrossable border, guarded by middle managers. An organization expert at DAF Trucks notes:

> "Obstacles never exist at the level of the shop floor, but higher up in the organization. These have to do with power and with the style of managing. [..] There is resistance among managers; they have to be retrained."

However, in the long run, obstruction by middle managers is generally not completely fatal for change initiatives, especially not when higher management is committed to change and is vigilant. (It is important to realize that management is not monolithic).[86] Higher managers have instruments to deal with this problem, including firing, demotion, promotion or trying to fit middle managers into a consulting and training role.

Power-related obstacles to change do not necessarily involve the management hierarchy.[87] Even workers who happen to be invested with a homeopathic dose of management power are affected. A Holec manager said:

> "Man has something macho, a propensity to make his job look more interesting to outsiders. Someone who is experienced and can give others a few instructions, however dumb he might be, gets something out of that. Group structures threaten [..] in the first place what I call 'pseudo-supervisors', people who organize something but who have nothing to decide on, the 'first workers' ('eerste medewerkers') and the foremen. [..] It was difficult to demote the first workers, a number of them became ill."

In some cases a labor elite was sharing in management power and defending its position. One of the obstacles that became apparent in the experiment with complete engine assembly at Volkswagen (early 1970's), was that the works council found the autonomy of the teams too far-reaching. In its written evaluation, the works council objects against workers planning their work a week in advance, although the team members themselves agreed to this system (Granel 1979: 63). This in turn caused IG Metall (the metalworkers' union) to oppose far-flung autonomy. The reason for IG Metall to be against it, was not only that it would weaken the co-determination structures laid down in the law - the works council is the union's base inside the company - but also because semi-

autonomous groups are not compatible with the individual piece-rate system.

In the job redesign project in vacuum cleaner assembly at AEG-Telefunken, both the management and the works council opposed the idea to transfer decision-making to workers (AEG-Telefunken 1983b: 74-85). Lack of commitment by unions is - according to an evaluation study - part of the explanation for the failure of a LOM project in a steel plant (Naschold 1992b Anhang C: 76-90).

Protecting the vested interests of union officials and works council (presidents') position in the company's power structure, is not the only ground for union leaders and works council members to oppose change initiatives. A additional ground is the concern about risks like intensification of work and the risk for weaker workers to get pushed out of teams. In the Volkswagen case both were in evidence. Nevertheless, it is important to note that cases in which works councils and unions oppose initiative to change are relatively exceptional.

6.3 Conclusions and further analysis

To summarize the argument thus far: a few cases showed the maintenance of management power working as a constraint on consensual anti-Tayloristic policy. This is especially evident on the level of middle management. But top management on the one hand, and workers who, at least subjectively, slightly shared in management power on the other hand, were not entirely free from it. There were even cases in which worker representatives defended their position in the power structure against worker autonomy. Still, one should not rule out the possibility that power-related constraints are more significant than they seem. (Because the present study does not deal with organizations that are not active in the anti-Tayloristic field, it leaves this possibility open.)
In the organizations that did start out to create consensual alternatives, the level of ambition in terms of granting power to workers tended to be not dramatic.

This follows from an analysis of how, and to what extent, initiatives combine the following issues: alleviation of technical discipline, job enlargement, job enrichment, decentralization of responsibility and participation. (A detailed explanation of the analysis is in Appendix A). This analysis revealed two dimensions. The first dimension is of interest for the present discussion. This dimension is the scope of worker em-powerment. At one extreme, there are efforts to give workers some control over their own movements, through the relaxation of technical disciplinary mechanisms like machine pacing. Next comes job enlarge-ment (adding more tasks of the same order of complexity), making pos-

sible some freedom to move around. Beyond this point, decision-making power becomes the focal point. First, there is decentralization of responsibility, i.e. the worker can make (some) decisions regarding his or her own tasks. Then, at the far end of the spectrum, there is participation. Through participation, the worker is involved in decision-making on matters that transcend his or her own tasks.

It is remarkable that there were only two attempts, at Volvo Uddevalla and DAF Trucks, to take workers all the way up from the most basic level, alleviation of technical discipline, to participation. From all the cases that start out at alleviation of technical discipline, only four stretch as far as decentralization of responsibility or beyond.

Furthermore, in Chapter Five we have seen that decentralization of responsibility often included short term planning. Decentralization of responsibility for long-term or even medium-term planning was absent. And in the area of participation, cases that included decision-making on investment were exceptional.

Further exploration of power constraints in the context of consensual alternatives is a Catch-22: it would require bold experiments, but were those experiments likely to expose power constraints, they would never come into existence.[88] Therefore it is interesting to look into a type of policy that takes power as its starting point: worker mobilization. This is the subject of the next chapter.

CHAPTER SEVEN WORKER MOBILIZATION AS AN ANTIDOTE

This chapter is devoted to worker mobilization for anti-Tayloristic change. Worker mobilization, or in other words, independent union action, might counteract the constraints imposed by the maintenance of management power. ("Independent action" is action outside the framework of consensual alternatives or joint enlightenment activities.) At the same time, worker mobilization would be a policy that bypasses the bridging variable "implementation of consensual alternatives".

Generally, the direct cause or catalyst for independent union action on matters of work organization is the introduction of new technology (Cressey 1992: 230). Unions need an opening to get involved in the organization of work, and the introduction of new technology provides such an opening. Furthermore, for the organization concerned, the introduction of new technology is a decision point between Tayloristic and non-Tayloristic courses of development.

7.1 Origins

At the end of the 1960' and in the early 1970's, circles of trade unionists and intellectuals in Scandinavia grew skeptical of the consensual experiments. One of the them was the Norwegian computer scientist Kirsten Nygaard.[89] Bridging the gap between his profession and his radical political views, he organized a study group with young trade unionists (who later turned out to become union leaders). This led to the creation of the Iron and Metal project, a systematic union attempt to exert influence over the organization of work.

The reason for skepticism against consensual alternatives was the power question. For Nygaard, the experiments were a form of manipulation, since the employers could brush the changes aside whenever they wanted, without asking the employees. He called the joint projects "harmful" and a "wet blanket". In Sweden, trade unionists criticized the managers' side for not wanting to transfer power to workers. As perceived by the unionists, the employers themselves did not want to cooperate in projects that detracted from their power.[90] (The findings in Chapter Six do not contradict this perception.) As the implementation phase of joint management-labor projects in Sweden approached, the consensus between employers and workers broke down. Conflicts broke out between employers who focused on the level of the individual and emphasized productivity and solutions for personnel problems, and workers' representatives who attached more importance to democratization. The unions withdrew from the coalition, with the conclusion that

they needed a way to exert an autonomous influence on the labor process. This influence would have to be modeled after representative democracy.

Sandberg (1992: 76) describes this point of view as: "Self-determination in the daily work situation (often group work) and co-determination for such managerial questions as planning were seen as two interacting parts in the process of democratization."

Thus, dissatisfaction with the power-related limitations of consensual alternatives gave rise to a strategy for independent union action. This strategy, that had its roots in Scandinavia but eventually spread to other north-western European countries, has a fundamentally multilevel character.

7.2 Basic mechanisms for autonomous union influence

There are two basic mechanisms for autonomous union influence. One of these mechanisms is negotiation. The idea is to try and reach agreements with management on various levels (national, regional, industry, firm).

In Norway, one of the results of the Iron and Metal project was the development of a strategy to exploit the possibilities of existing laws by bargaining for technology agreements. The first outcomes were a local data agreement in 1974 and a national agreement in 1975.

Key elements in those agreements were information rights and participation of employees and unions in systems development. Unions were entitled to elect "data stewards". Data stewards were to have access to all documentation of programs and hardware.

Box 7.1 Some provisions in the Norwegian Data Agreement

"In efforts to give workers in various departments or working groups greater scope to take decisions in their daily work themselves, one important step is to further their understanding of and insight into the financial position of the enterprise.
Real influence on the part of the employees concerned should be secured by establishing working, project and steering groups in an enterprise, but outside its regular organizational structure." (From the 1975 Data Agreement, in Kallevig 1990: 10)
"When the parties agree to engage in projects, real influence should be ensured not only for workers' elected representatives, but also for representatives of the employees directly concerned. The main organizations recommend that as far as possible all employees whom the projects directly concern should be engaged in work on them." (From the 1982 Supplementary Agreement II, in Kallevig 1990: 19)

The national agreement was the framework for an increasing number of local agreements. A training program for data stewards got under way. The Norwegian example inspired unionists in Sweden, Germany, the U.K. and The Netherlands to start negotiations about new technology and the organization of work.[91]

The second basic mechanism is developing alternatives for management schemes. This mechanism too, already flowed forth from the Norwegian Iron and Metal project. In this project, working parties with a total of 120 members and shop stewards investigated planning and control systems in their organizations, and developed proposals for improvement. A case in point is a proposal to re-organize an assembly line to make work less monotonous.

This idea, too, spread to other countries and lived on. For example, IG Metall's official policy (in 1992) regarding the organization of work, is to aim at a "competition of strategies" within the firm. The intention is for IG Metall to produce plans that are so good that they are impossible to ignore. The employees must participate in the development of these plans, and in this way bring management under legitimation pressure.

The two basic strategies, negotiation and creation of union alternatives, conflict as much as they are complementary. According to A. Drinkuth, Head of IG Metall's department for Automation/Technology/Humanization of Working Life, there is a current within IG Metall that rejects developing alternatives as "co-management". In terms of official program goals, Drinkuth and his department have the upper hand, but "reality is different", says Drinkuth: "Many unionists say: 'Just give me a company agreement'".

7.3 Supporting activities

Three types of activity are designed to promote union influence on job design:
- knowledge creation from union viewpoints;
- mobilization of financial resources for knowledge creation;
- pressing for legislation that offers unions more opportunity for influencing the organization of work.

7.3.1 Independent development of knowledge, primarily in relation to automation

Sandberg (et al. 1992: 105) describes independent union development of knowledge as a way to get beyond the "un-dialectical pendulum between the wage-negotiation model and pure participation". This approach has its roots in Scandinavia. The first project of this kind, the Iron and Metal

project, was a joint effort by the Norwegian Iron and Metal Workers' Union and the state-owned Norwegian Computing Center, where Nygaard worked. The basic idea was to make a departure from the existing knowledge about the impact of computers, and to aim for knowledge creation from the point of view of the workers' interests. Nygaard (1979: 95) wrote: "[..] it was felt that workers would risk brainwashing themselves if they tried to assimilate the existing knowledge about the effects of these systems as a starting platform." The first step was to write a textbook on "Planning, Control and Data Processing". Apart from the need for a text in comprehensible language, reasons for writing a new textbook were:

> "[..] the fact that planning, control and data processing systems are designed to further the objectives of those who are in power, and thus are not 'neutral' and 'objective', had to be emphasized as a basis for understanding" [..] "the starting point should be the members' own conception of their work and interests, not the system analyst's understanding of reality" (Nygaard 1979: 99).

At first, the project developed in a pure research direction with the consent of the steering committee, including the union representatives. However, the researchers felt that the results would not be useful for practical union activities. This led to a shift of emphasis, whereby results were defined as "actions carried out by the Iron and Metal Workers' Union, centrally or locally, as part of or initiated by the project" (Nygaard 1979: 98).

Ehn (1988) calls this type of co-operation the "Collective Resources Approach" in systems development. In 1975, the Iron and Metalworkers' Project inspired a group of Swedish researchers, among them computer scientists and sociologists, to start the DEMOS project. The aim was to support local union groups that wanted to influence the introduction of information technology. In this view, the local union groups would carry out research themselves, supported by a scientist who would, as a participant, invest time and experience. Sources of inspiration were Braverman's "Labor and Monopoly Capital, The Degradation of Work in the Twentieth Century" and Freire's "Pedagogy of the oppressed".

From these Scandinavian beginnings sprang a tradition of building-up union knowledge, carried by union staff members who maintain links with sympathizing researchers in universities and research institutes. In addition to this, (social) scientists founded consulting firms that specialize in supporting union activity. These firms, among which Arbetstagarkonsult AB in Sweden and STZ[92] in The Netherlands, carry out research as well.

The specialized consultants provided a range of services to union clubs and works councils:

- In The Netherlands, STZ developed a research method, that at the same time aimed at raising consciousness. (Bouwman 1989: 41) This method features discussion groups, guided by semi-structured questionnaires.
- In Sweden, consultants help organize study circles of workers. These worker study circles carries on an old Scandinavian tradition, and are not structured as research projects.
- Making workers (and worker representatives) aware of the design space, by supplying examples of anti-Tayloristic development in other companies and in other countries.
- Formulating demands, designed to ensure a shift away from Taylorism.
- Drawing up alternative plans, for example alternative lay-outs for new facilities.
- Participating in joint project groups or design committees, sometimes going as far as speaking on the workers' behalf.

7.3.2 Mobilization of resources

Building up union knowledge involved a quest for funds. Especially social democratic governments have been willing to offer support. Already, the pioneering Norwegian Iron and Metal project received state money, and in 1972 in Sweden, the Arbetsmiljöfonden (Work Environment Fund) was created. The Work Environment Fund finances both bipartite enlightenment projects and independent union projects. Furthermore, the (social democratic) government committed funds to promote co-determination. In 1977/78, this amounted to SEK 115 million; 20 million was for research, 20 million for educating workers' representatives in supervisory boards, 75 million was divided among employers and unions for education and information (Auer 1983: 72). The Work Environment Fund financed part of the DEMOS project.

In the German states of Nordrhein-Westfalen and Niedersachsen, there are "Technologie Beratungsstellen" (Technology Advisory Services) that are government sponsored union organizations. In The Netherlands, there are companies that allocate funds to works councils - the most active members of which tend to be union members - to enable them to hire consultants. Subsidies to unions for hiring consultants do exist as well.[93]

7.3.3 Pressing for legislation that offers unions more opportunity for influence

This avenue was followed most extensively in Sweden. After the failure of the co-operation with the employers, the Swedish trade union movement started what is usually called the "work legislation offensive". In

pursuing this line of policy, the trade union movement benefited from the good access possibilities to the social democratic government. (In 1976, the social democrats lost the election, to regain office in 1982.) The most important result was the passing of a co-determination act (the "MBL") in 1976. Its goal was to widen the terrain on which collective agreements are made, to include management policy, e.g. on technological or organizational change (Gill 1985: 152). The Co-determination Act provides formal rules for co-determination. Employers were obliged to inform trade unions and to negotiate prior to introducing major changes. The unions, for example, became entitled to inspect the accounts of companies. The Co-determination Act made it legitimate for unions to demand negotiations on most issues that are at stake in a company (Gustavsen 1984: 14). However, the right for managers to manage was not substantially curtailed (Bansler 1989: 94).

The framework provided by the Co-determination Act was intended to be extended by further central collective agreements. This did indeed happen, but not as quickly as was expected. The public sector saw an agreement in 1979. Like the Co-determination Act, this agreement was general in character. It stipulated that it would have to be elaborated by further local agreements about rationalization, monitoring at work, mobility of workers, planning, career planning and availability of information (Christis et al. 1985: 66).

In the Swedish public sector, a collective agreement grants the union a temporary veto power.[94]

In the private sector, the viewpoints of workers and employers were wider apart. The trade union, for instance, wanted the right to veto plans on computerization. The employers were opposed to this. Employers' expert Agurén remarked that the employers were frightened, because the trade unions assumed to be able to derive power from the Co-determination Act.[95]

As a result of the controversies, it took longer in the private sector than in the public sector before central agreements were reached. It was 1982 when the agreement for 1.3 million workers in industry appeared. This agreement is known as the "Agreement on Efficiency and Participation" or "Development Agreement". These goals were stated:

- "The introduction of new technology should be characterized by a holistic perspective, i.e. by a subtle balance between the goals regarding business ideas, personnel, technology and work organization."
- "Technology should be utilized to maintain and further develop the knowledge and skills of individual workers, to facilitate new work organizations with new scope for worker participation and to eliminate environmental risks."
- "The development process should be characterized by the active and meaningful participation of workers and their unions."

The agreement provided that research on working condition and organization in firms could take place and that unions could hire consultants at employers' costs.

Apart from central agreements and agreements per sector, agreements were reached on the level of branches of industry and on the level of the firm. This happened, for example, at the Postgiro and at Volvo.

Conclusion

The Swedish work legislation offensive was successful in bringing about agreements covering work and technology.

Scandinavia represents the top in terms of legislation that offers unions more opportunity for influence on the organization of work. At the low end of the spectrum lies the U.K..[96] Germany and The Netherlands are in between.

7.4 Impact; a bleak picture

Studies, designed to assess the impact of autonomous union action on the organization of work, tend to paint a bleak picture.

In the U.K., technology agreements that were reached in companies (an attempt to reach a national agreement with the employers failed) usually contained no provisions on performance measurement by computerized systems and deskilling (Gill 1985: 127). There was much attention for health and safety, rather than for the design of jobs and its impact on the quality of working life. The frequency of the appearance of new agreements dropped off sharply (Gill 1985: 131-133).

In The Netherlands, thirty technology agreements were reached in the early 1980's. Research into these agreements led to the conclusion that these "contributed little for the improvement of the quality of working life and for the control of unions on new technologies" (Van Uitert 1990).

Cressey (1992: 240), drawing in part on research commissioned by the European Foundation for the Improvement of Working and Living Conditions, distinguished five different regulatory mechanisms that unions can use:
- no involvement;
- information provision;
- consultation;
- negotiation;
- joint decision-making (including veto powers).

He reports that few cases involved the strong regulatory mechanisms, i.e. negotiation and joint decision-making.

Kallevig (1990) cites survey results that show that ten to fifteen per cent of the Norwegian union members feel that there is a clear union influence over the implementation and use of new technology.[97]

In The Netherlands, an investigation into the influence that fifteen works councils had on automation, established that there was none. Ten of the works councils had never even received a request to provide advice to management on matters of information technology (Van Asch and Jansen 1986).

Researchers have pointed to an array of obstacles to union/works council influence on the organization of work.

7.5 Obstacle one: The double trap of technical change[98]

In the early planning stages of technical change, the design space (the number of degrees of freedom) is largest. As planning goes on, the design options get narrower. At the start of the implementation phase, much is already laid down. The possibilities for union access to the decision-making process follow a pattern that is exactly the opposite. In the early planning stages, unionists have no access. Often, they even get no information on what is going on. Typically, union access is greatest in the later stages, in which there is relatively little left to decide on.

Several authors made this point. Cressey (1992: 242-244), reviewing an extensive range of participation research, noted that workers had little input in the planning phase. Both managers and workers assumed that this is a job for specialists only. Most worker influence was in the implementation phase. This influence was often formal in character. He concluded that there was "little real involvement in technological change outside of the implementation phase" (244). Research by the Arbetslivscentrum also showed that union involvement was least in the starting phase.[99]

Sandberg (1992: 116) points out that in practice, information rights depend on the benevolence of managers, and that workers often get information after management had evaluated alternatives and has drafted a proposal.

In The Netherlands, the co-determination law gives works councils a limited veto power on changes in policy regarding safety, health or well-being at work. However, a works council of the AMRO Bank lost a court case regarding the investment in 110 PC's. They lost the case because it was an experiment. This case established that the limited veto power applies only to advanced stages of technical change, when there are definitive plans.

Dutch stevedoring company ECT is a good example of late worker involvement. In 1981, the works council got involved in the design of the

(organization of work on the) Delta 1 terminal when it received a request to provide advice on a social plan for this terminal. By then, the planning process for this terminal was already under way for seven years. In 1988, when the works council, armed with the service of consultants, wanted to influence the design of the Delta 2 terminal, the time lag between design and worker influence had shrunk. Now, the works council was five years behind the designers. When the works council started its involvement, already 150 engineers were busy working on the design.

However, the ECT Delta 2 terminal shows that, even when the union/works council becomes involved in a late stage, some results are possible (a technical solution that gave workers somewhat greater autonomy). Also in the VW (MWB) machine tools factory, the works council was late. When it started its involvement, building activities had already taken place, foundations for machines had already been made. Still, there proved to be some room for influence, leading to a shift in policy towards shop floor programming (IGM 1988).

In some cases, unions managed to steer clear of the double-trap obstacle by getting involved early. One of these cases is the Swedish Postgiro. Like in many other firms the management of the Swedish Postgiro customarily used information technology to reduce labor costs. In 1970, with a possible reduction of 800 jobs in mind, management introduced machine readable forms for internal use. Upon completion of the project in 1976, it became evident that 300 more jobs had disappeared, than had been expected. Furthermore, evaluations showed that the system gave rise to boring work for many workers (Grip en Sundström 1985: 58).

After 1976, management continued along the lines of using new technology to reduce staffing and developed a plan for a paperless Giro. It was intended to make an electronic image from incoming forms, including those that carry handwritten information. After this, the forms could be discarded. To enter the data from the forms into the information systems, the stored image would be displayed on a screen from which a worker would read the data and key it in.

In this period, the approach to automation was characterized by a search for purely technical solutions, without looking into organizational aspects.

Union representatives resented the plan for a paperless Postgiro. They expected 800 jobs to be lost, a degradation of the quality of work and an unsafe situation. Active union members feared being tied to machinery, losing an overview, and machine pacing of the work. In part, these reactions were determined by the negative experiences from the previous rationalization wave. The unions established a joint body, made a newsletter and held meetings with members. They used the opportunities offered by the co-determination act to enter into negotiations with

management. For this purpose, the unions instituted a negotiating party of 20 members. The unions entered the negotiations with these goals:

- The Postgiro should start with systems development all over again.
- Market analysis had to be done before deciding on new technology.
- The changes should not cause a reduction of the number of jobs.
- Customer satisfaction had to be sought after.
- Management should provide more information.
- A local collective agreement was needed. (This would be the first one in the public sector.)

Management did not assume a negative attitude towards these demands. Cooperation with the unions was necessary because of the vulnerability of the forms factory, which was committed to processing all forms within 24 hours. In the negotiations, the unions seemed to get their way. In 1979, an agreement was reached specifying new starting-points for the future production system of the Postgiro: improved working conditions, improved work contents, no reduction in jobs, development of new products and a high level of service. This was followed by a period of further negotiations, conflicts and agreements. According to Lars Sundström, in these days working as a consultant to the unions, the management was surprised by the legal implications of the agreement that was signed in 1979. The Co-determination Act provides that when a difference of opinion exists about the interpretation of an agreement, the union viewpoint takes precedence. When it became evident that management continued on the original track, the one that was rejected by the unions, by asking quotations from suppliers and by getting ready to test equipment, the unions were able to denounce this as an offense against the Co-determination Act.

A group of five union members and three external consultants ventured to mobilize the workers by organizing study circles. In the study circles, participants started by explaining to each other what their work entailed. Hitherto, the division of labor had prevented many workers to know much about the work of their colleagues. Issues discussed included what the work should look like in the future, the market, technical possibilities and the demands of the unions. A total of 400 workers took part in these study circles. Finally, management too decided to organize a form of study circles for the workers.

In this case, the union had a relatively clear management policy to react to. There are also cases, in which the only thing that was given at the outset, was that the company needed to build a new plant. From there on, union/works council activities had to entirely proactive. One of these cases is the COVECO meat processing company in Weert, The Netherlands. In 1983, the works council got involved even before management had carried out a feasibility study or had decided on a location. Starting with a preventive plan - avoiding the creation of monotonous

work - and armed with training on technological development and various design principles, and with the services of an external consultant, the works council prepared itself to judge and amend the management's propositions (Bouwman 1989).

In the design process of the Skånemejerier dairy in Malmö, we see trade unionists in a still more pro-active role. Starting point was an action program of a local "Work Environment Group" comprising members of the local branches of the Swedish Foodworkers' Union (Livs), the Swedish Association of Supervisors and Foremen (SALF) and the Swedish Union of Clerical and Technical Employees in Industry (SIF). Researchers supported this group. Before the design process started, the group defined well-developed aims:

- job enrichment;
- semi-autonomous teams;
- a plant lay-out that would promote social contacts, avoids isolated workstations and that does not inhibit the expansion of work content.

The group imagined that every morning, representatives from all teams would meet to discuss the production planned for the day. (Steen and Ullmark 1984)

7.6 Obstacle two: the knowledge gap

According to Bansler (1989: 94), the "local union strategy" did not show the results that had been expected. Interested scientists like Morten Kyng and Pelle Ehn saw the cause for this in the lack of time and experience, making it difficult for unions to analyze management proposals and to suggest alternatives. In addition, they found that the unions suffered from a lack of knowledge of production technology, forcing them to remain in a defensive position.

One of the explanations for the failure of technology agreements in The Netherlands is that the unions lacked the knowledge needed to check whether management complied with the agreements (According to M. Roggen in Van Uitert 1990: 19).

Employing external consultants does not guarantee the complete closure of the knowledge gap. An internal report on a support program by the Dutch Union for Workers in the Service Sector (Dienstenbond FNV) speaks critically of the research performed by the external consultant. It did not lead to many useful recommendations. Furthermore, the consultant had difficulty in coming to grips with automation projects (Van Uitert 1990). However, it is fair to note that understanding a large scale automation project is a daunting task. For example, in their endeavor to influence the design of ECT's Delta 2 terminal, the works council, together

with their consultant, had to plow through one meter of technical documents describing the control information system.

But it is not an iron law that a knowledge gap between management and unions exists. According to Steen and Ullmark (1984: 78), the final lay-out of the new Skånemejerier dairy in Malmö bears a large resemblance to the lay-out that was proposed by the unions. The consultants that worked for management and invited suppliers of equipment had proposed widely different solutions. In 1992, the plant manager confirmed that union's consultants were knowledgeable. He substantiated this by pointing to the fact that, since the plant began operations, nothing had to be changed (except one detail, the addition of a wall to protect workers in the loading/unloading area from wind).

7.7 Obstacle three: negotiating on qualitative issues is problematic, putting the negotiated results into practice is problematic as well

Sandberg et al. (1992: 107) wrote that union mobilization and negotiation on qualitative and unstructured issues is problematic. An additional difficulty is, that management must have the knowledge required to put the negotiated results into practice. Roggen (in Van Uitert 1990: 19), commenting on technology agreements, noted that provisions and criteria were stated in terms that were (too) general and open to divergent interpretations.

In the early 1970's, there was a determined effort on the part of IG Metall in Nordwürttemberg/Nordbaden to use negotiations to reach a shift away from Taylorism.[100] The union started with this demand:

> "In manufacturing industry, the working human must no longer be seen as a cog, a Tayloristic particle or a robot. The goal must be to employ him in such a way as he deserves, as a being with a mind and a soul, with his own creative imagination, whose creativity and need for communication may not be restricted to his leisure time."

Before the negotiations, the union converted this into "core demands", that had a more quantitative nature:
1) Protection against redundancy and wage guarantee for workers over the age of fifty;
2) Basically, for every hour, there must be a break of six minutes;
3) A minimum wage guarantee for piece-rate work;
4) Work cycles shorter than five minutes must be prohibited;
5) More co-determination for group work in assembly line work.

In the process of quantification, the original vision of a new reality got watered down.

A conflict with the employers developed, particularly around the break issue and the individual wage guarantee. After a week-long strike, an enabling collective agreement appeared, that included provisions on "flow, assembly line and machine paced work":

> "Flow, assembly line and machine paced work are a forced sequence of labor steps that a workpiece must run through and that must be carried out by one or more people. Labor system and labor content are adjusted to one another in time and in space. It is not possible to deviate from the prescribed pace. [..] Job design in flow, assembly line and machine paced work must preferentially aim, while taking into account scientific knowledge on job design, to soften the harmful effect of monotony by job enlargement or job enrichment. This obligation for employers applies extra forcefully when flow, assembly line and machine paced work is newly planned, and in all cases in which work content is so degraded that the cycle time is less than 1.5 minutes. Employer and works council must exploit all possibilities for job enlargement and job enrichment. [..] Basically, existing job cycles must not be subdivided any further."

Note that the idea of a minimum desirable cycle length remained, but that it became considerably shorter.

The agreement also stipulates that workers must be able to take three minutes off every hour for their personal needs. According to Schauer et al. (1984), this implied that machine-tied and machine-paced work) were not allowed.

The researchers offer a balanced report on the impact of the agreement. They found that managers still carried out system changes and mechanization projects that, in violation of the agreement, resulted in cycle times below 1.5 minutes. Furthermore, the breaks required by the agreement lowered the capacity of production line. To compensate for this, managers added workstations, thereby lowering cycle times. Nonetheless, the researchers concluded that further subdivision of cycles had become more difficult to implement, but that this effect was restricted to repetitive assembly work. Schauer et al. (1984: 231) noted that in skilled work, the transition to repetitive detailed work continued.

The definition of flow, assembly line and machine paced work was a problem. It was open to at least six different interpretations (Schauer et al. 1984: 221-225). The design of jobs tends to lie outside the scope of formal agreements (Schauer et al. 1984: 164). Furthermore, in many

companies there had been no systematic attempts to list the jobs that had cycle times below 1.5 minutes.

On the positive side, the researchers report that there were sporadic cases of job enrichment. This was achieved by works councils that influenced planning while referring to the agreement. Notwithstanding this positive note in the report, it is telling that IG Metall never ventured in this direction again.

7.8 Obstacle four: difficulty for workers to take initiatory control

Cressey (1992: 246) sees as a limitation on the possibilities of unions that the position of workers fundamentally differs from that of managers. He asserts that managers "can take initiatory or positive control over the process of innovation".

Two cases show that it is not an iron law that only managers can take initiatory control.

In 1981, a joint body was established by social scientists and computer scientists from Denmark and Sweden, graphic workers and officials from the Nordic Graphic Worker's Union, for devising an alternative technology for newspaper page make-up. (Some of the researchers had been active in the DEMOS project. A part of the DEMOS project dealt with newspaper production.) The original goal of the UTOPIA project was to produce a specification for a system that would make it possible to maintain the skills of graphic workers and to improve the quality of the product. The specification had to be generally applicable to newspaper production and, as a side effect, it had to be useful in negotiations. A further aim was to contribute to the training of graphic workers. The background for the UTOPIA project was the impending introduction of automated page make-up systems (in the early 1980's). In the U.S., a tendency could be seen that the new systems were operated by workers without graphic skills (journalists or semi-skilled workers). These systems allowed employers to make graphic workers redundant and at the same time caused a loss of quality in the product.

The UTOPIA project was approached by a Swedish supplier who was developing a new page make-up system (Liber/TIPS). Marketing reasons prompted Liber/TIPS to try capturing a large share of the home market. This made it necessary to comply with the demands of the Scandinavian graphic unions. Liber/Tips and the UTOPIA group decided to see if they could work together to realize their ideas in a commercial system. This gave the UTOPIA group the opportunity to influence a development project worth 10 million dollars.

The designers distanced themselves from page make-up systems that take coordinates of boxes as input, in which the text is then automatically fitted. Instead, they wanted to develop a way of working that is in principle similar to the "paper paste-up" method. This requires that the material can be directly manipulated on a high resolution graphic workstation. The page has to be displayed as realistically as possible. The make-up work consists of ordering and reordering the material until a good result is obtained. The intention was to do more than just recreating the old way of working. The use of computers makes it possible to combine the advantage of the traditional lead typesetting - firmness of typography - and the advantage of the paper paste-up method - flexibility. A problem of computer page make-up is the low resolution of even the best computer screens, when compared to a real newspaper page. Furthermore, there are no screens the size of a newspaper page. Much development work was devoted to creating software tools to get around these obstacles. "Software lenses", imitating real lenses in operation, were a solution for the problem of low resolution.

Apart from specifications for the page make-up system, the UTOPIA group developed a specification for a scanner for images. The union wanted every single task to have an acceptable level of skill. Therefore the scanner needed to have capabilities for image processing and manipulation. This would mean efficiency benefits as well, because in the phase of page make-up, which normally is done under time pressure, less work would have to be done on the images.

The technical design was complemented by a design for a work organization. Historical and sociological research was done. An example is a study on the automation of newspaper production in the U.S., in order to obtain a clear negative example.

The technical design was based on what the researchers called a "tool perspective":

> "The computer support is designed as a collection of tools for the skilled worker to use. The tool perspective takes the work process as its origin rather than data or information flow. This means: not detailed analysis, description and formalization of qualifications, but development of professional education based on the skills of professionals; not information flow analysis and systems description, but specification of tools." (Bødker 1987: 261)

The development method is characterized by cooperation between workers and professional developers. The main techniques were simulation of the work on mock-up workstations and the use of a "work organization toolbox" to show possible production flows and organizational solutions.

Another case in point is the initiative of shop stewards at Lucas Aerospace to counter imminent redundancies by developing socially useful products (Wainwright and Elliot 1982). An appealing technical success was a prototype road-rail vehicle in the form of a converted bus. (Management policy, however, did not change.) Both cases, the Utopia project and the Lucas Plan, show at least that it is not only managers who can take initiatory control over new technology.

7.9 Interim conclusion

All four obstacles, the double trap of technical change, the knowledge gap, the difficulties pertaining to negotiations on qualitative issues and deprivation of initiatory control are real. Nevertheless, none of these obstacles is necessarily fatal for change initiatives. Furthermore, there are ways for unions and works councils to evade or overcome these obstacles. Often, these entail extraordinary effort and favorable circumstances. But we have to take into account the effect of cumulation of obstacles, which lowers the overall chance for success.

7.10 Impact revisited

The bleak picture derived from existing surveys may lead to the conclusion that attempts by unions and works councils to gain influence over the organization of work were all fruitless. This is not the case. A search[101] produced sixteen cases of local union/works council initiatives, that had anti-Tayloristic goals. In half of these cases, there was an effect on the design of jobs. However, it is clear that, in contrast with consensual alternatives, one is hard-pressed to find cases of autonomous union action that resulted in shifts away from Taylorism.

There is a second difference between autonomous union/works council initiatives and consensual alternatives. Compared to consensual alternatives, a much larger proportion of independent union/works council initiatives (80 per cent against 8.4 per cent) included attempts to *prevent* further detail division of labor, separation of conception from execution, increasing technical discipline and the disappearance of human skills and expertise into automatic machinery and information systems. This implies the following: the superior effectiveness of consensual anti-Tayloristic policy (consensual alternatives propelled by enlightenment) might lead unions to fully abandon the course of independent actions. However, because consensual alternatives are attempts to improve situations rather than to avert threats of further Taylorization, this would

rob the unions of the means to counteract further Taylorization where it occurs.

The search produced five (more or less) successful cases where unions/works councils averted Taylorist threats. *In three cases, plans for Tayloristic applications of information technology were canceled*.

a) At the Scandinavian Airline SAS, management wanted to introduce an expert system for aircraft maintenance. Because this would mean a risk of deskilling, there was union resistance. This led to the deployment of a database system instead of an expert system. In this way, the maintenance process remained entirely based on the skills of the workers, who could use the database to retrieve information as needed.[102] (While assessing this case, it is important to note that in the 1980's, expert systems were still experimental technology.)

A part of the Swedish DEMOS project took place in a railway repair shop. Its management wanted to introduce a computerized production planning system ("ISA-KLAR"). This system would give workers detailed instructions such as:

"1) Fetch tools x and y
2) Go by bogie
3) Crawl into position
4) Remove split pen
5) Remove bolt and washer
6) Repeat operation 3-5 for remaining 5 bolts
7) Transport out
Estimated time required for this job: x minutes." (Sandberg 1983: 68)

As an alternative, the workers wanted to develop further the existing system of semi-autonomous groups. Finally, they had their way. (Sandberg (1983: 63) wondered whether this resulted from the force of the unions or from the fact that management realized, during the process, that the union alternative would mean more efficient and intensive work than would be the case with the ISA-KLAR system.)

c) At the Swedish Postgiro, an automation plan that implied far-reaching computer control was dropped. After mobilization and negotiation, management dropped this plan for a "paperless" giro. This was what the unions wanted; but doubts about the technical feasibility could also have been a reason for management to drop the plan. Later, directors informally remarked that the unions had saved them from a technical disaster.

An second important item, that was on the union's wish list, was the integration of bookkeeping work and the investigation of errors. This did not become a reality.

In all three cases, there are reasons to doubt the technical feasibility and/or economic viability of the plans that were canceled. This makes it likely that, without union intervention, after a waste of money, the end result would have been the same.

In one case, intervention by a works council led to a company decision to leave some discretion to straddle carrier drivers.

d) At the ECT stevedoring company, there was one tangible result of the attempts by the works council to influence the design of the jobs on the Delta 2 terminal. This terminal has a fully automatic stack (storage area). This means that AGV's (Automated Guided Vehicles), unmanned computer controlled trucks, carry containers around the terminal. The stack is equipped with computer controlled stacking cranes. Containers are placed randomly in the stack. It is only at the boundaries of this automatic system that human operations take place. The quay cranes that unload containers from ships onto AGV's and vice versa, are still man-operated. And where the system connects with road transportation, there is work for straddle-carrier drivers. Straddle-carriers are used to lift containers off AGV's and load these onto road trucks and vice versa. This residual work is short-cycled. Compared to a traditional stack, in which straddle-carriers travel greater distances, cycles are shorter.

Originally, the plan was to use the information system to allocate work over the straddle-carriers. The information system would tell each driver exactly which container to take next. Intervention by the works council led to the development of a system that shows drivers which containers are waiting to be picked up, and what the various waiting times are. The drivers can, while communicating by radio, work out optimal solutions. Those responsible for planning and designing the labor process in this terminal disagreed among themselves on the desirability of full computer control of the straddle carrier driver's work. This helped the workers' side to exert influence. To make the debate more informed, designers arranged to simulate the alternative forms of control. Actual drivers, sitting at VDU's, received simulated instructions.[103] (It is debatable, however, whether a choice between a small set of containers represents real autonomy.)

A more ambitious plan from the workers' side was to include in the lay-out of the terminal a non-automatic, traditional stack for storing "reefers" (refrigerated containers) and off-standard containers. This would

have led to potentially longer cycle times and less monotony for the straddle carrier drivers. This latter plan failed.

In one case, union intervention led to a company choice to retain a level of manual regulation.

e) Three unions, the Swedish Foodworkers' Union (Livs), the Swedish Association of Supervisors and Foremen (SALF) and the Swedish Union of Clerical and Technical Employees in Industry (SIF) were involved in de design of the Skånemejerier dairy in Malmö, which opened in 1984. The final design has a special feature, that sets it apart from many other modern dairies: the regulation of the fat content of the milk was deliberately not automated. Manual regulation of fat content takes place by means of three screws in the process department.

Like in other cases, it is not entirely clear to what extent union influence has to be credited for this anti-Tayloristic aspect of the design.

Union involvement started with of an action program. Subsequently, influencing the design process took place through participation in a project group. Steen and Ullmark (1984: 77) who were personally involved as consultants for the unions' side, note that it is difficult, in a joint debate, to pinpoint which substantial changes were caused by union influence.

Eight years after the start of production, the manual regulation of fat content was still there. Apparently, this was not due to any policy to preserve and enhance skills. The plant manager felt that manual regulation was important, because otherwise operators would never leave their control room, and would therefore be less likely to detect leaks. Furthermore, an automatic regulator would cost SEK 500.000, without leading to a saving of milk fat; monthly checks had established that the manual regulation system was optimal.

In this case, unionists had also striven toward the introduction of semi-autonomous teams. But this was not realized.

In one case, a union succeeded in having a system of performance monitoring banned.

f) In The Netherlands, PTT Telecom used the computerized system that allocates calls to operators for measuring operator performance. The union successfully took PTT Telecom to court to end this practice. (Legal action is a third mechanism for union influence besides negotiation and developing alternative plans.)

A category apart from these preventive actions are initiatives to create new structures. In this category, even initiatives that overcome or avoid the

four hurdles - the double trap of technical change, the knowledge gap, the difficulties pertaining to negotiations on qualitative issues and the deprivation of initiatory control - are not safe. More perils lie in their path.

In 1984, at the Swedish Postgiro, negotiations had arrived at a point, where the main demands of the unions were close to being satisfied:

- There was consensus that the work organization had to be changed, with an integration of bookkeeping and investigation of errors. This would mean job enrichment for the workers who enter transaction data in the bookkeeping department. However, managers had some doubts whether the workers would be able to cope with the more complex tasks and whether the work would not be too complex for temporary workers (Grip and Sundström 1985: 144).
- The plan for a paperless giro, meaning that data would have to be read from electronic images of forms on computer screens, was dropped. However, management did not exclude looking into this technology in the future.
- A different type of systems development had made its way into the Postgiro, in which market relations, organization, ergonomics and training are considered first before decisions are made about technology. System development became negotiable. Grip and Sundström (1985: 140) call this "dialectic system development": "Different system approaches are debated in negotiations and are changed during the process."

Such was the situation at the time of the "Control of Frontiers" research project, through which the Swedish Postgiro earned its place in history as an internationally outstanding case of worker influence.

But it turned out to be different. The CEO of the Postgiro and the director responsible for technology were replaced. The new management did not support the plan to integrate bookkeeping and investigation of errors. An argument was, that in this way, the three months backlog in investigation would increase. (Later it became evident that this backlog increased anyhow.) The trade unions were unable to have their way, especially because management exploited internal controversies in the workforce. The workers of the investigation department were less enthusiastic about the integration of investigation and bookkeeping. (For them, it did not represent job enrichment.)

As already mentioned, the plan for the paperless giro was not implemented. The change in the method of systems development was a lasting one. Since 1984 , 400 automation projects were carried out at the Postgiro, not a single one of them without participation of the unions. Organization and market are now considered before technology. The number of jobs at the Postgiro increased.

In this case, the limits of the Co-Determination Act were explored. However, this was done to such an extent, that the Swedish state advised semi-public firms to refrain from negotiating technology agreements.[104] Thus, this initiative suffered from some of the same obstacles that plague consensual alternatives, namely a contingent replacement of managers by more Tayloristically minded ones and job impoverishment for some as a side effect of job enrichment for others. Since workers' interests have to be in the foreground, a union driven initiative is more prone to fall over this latter obstacle than management driven initiatives.

Also at the Skånemejerier dairy in Malmö, the plan to introduce semi-autonomous teams ran afoul of a contingent change of management. The new plant manager saw decentralization of responsibility as inefficient under conditions in which high-speed operation is required. "We must run one hundred per cent smooth", said the plant manager: "We operate in a hard time schedule. It takes too much time for the workers to take their own responsibility. The manager must be high speed. He must take responsibility for everything and push it in a hard way." He added that, quite differently from the train or the newspaper, the dairy is never late, and that Volvo with its semi-autonomous teams needed too much time to produce a car, leading to the transferal of production outside Sweden.

In the COVECO meat processing plant (Weert, The Netherlands), semi-autonomous teams did not materialize either. The departure of the leading proponent on the workers' side played a role in this.

Again, these initiatives ran into difficulties that also threaten consensual alternatives.

The UTOPIA project saw many of its recommendations embodied in the final design of the Liber-TIPS page make-up system (Bansler 1989). But the cooperation between UTOPIA and Liber failed at a planned test installation at a newspaper. The management of the newspaper refused to combine the test installation with a well defined experiment on work organization. The main cause for the experiment to be called off was the demarcation disputes between journalists and graphic workers and their unions (Bødker 1987: 260).

There was a conflict between Liber and the UTOPIA group because Liber wanted to develop a different version of the system for the U.S. market, that was more adapted to a hierarchical work organization.

Finally, none of the two versions made it to the market. For a relatively small firm like Liber, developing two versions was expensive. Furthermore, the system was made obsolete by technological developments. It was based on the architecture of a central minicomputer (VAX) with terminals. Meanwhile, cheap, fast workstations with their own processing power appeared. Converting the software to run on these workstations would be too much of a financial burden for Liber.

However, the ideas of the UTOPIA project proved to be not an unrealistic dream. In the U.S., desktop publishing packages became available, that did not differ much from the ideal of the UTOPIA project. According to Pelle Ehn, project leader of the UTOPIA project, even early versions of Pagemaker (for Apple Macintosh and MS DOS PC's) had already 80 per cent of the required functionality. Twenty years of experience in the graphic craft had gone into the development of Pagemaker.

The Liber/TIPS scanner, with its image processing capabilities, did make it to the market. The further influence of the UTOPIA project was largely ideological. The project influenced collective agreements all over Scandinavia (Ehn 1988). Graphic workers in Scandinavia were informed about the UTOPIA project by the newsletter Grafiti, of which thousands of copies were distributed. There was also influence on the world of research and development. Pelle Ehn points in this respect to the Human Centered Technology Movement (Mike Cooley and Peter Brödner). However, since the UTOPIA project, this level of direct union involvement in the development of new technology has not occurred again.

However, the core of the UTOPIA project - the page make-up system - did not make it to the market. It did not overcome one of the obstacles that also lie in the way of the technical R & D projects in enlightenment programs: that non-ideologically inspired companies can produce products that have the same functionality as the intended alternative product. A second obstacle - the risk of obsolescence in terms of the hardware platforms - is common to all software projects.

As we have seen, union/works council initiatives to create new anti-Tayloristic structures in the workplace are confronted by extra barriers on top of the double trap of technological change, the knowledge gap, the problems of negotiating on qualitative issues, the problem of putting the negotiated results into practice and the difficulty for workers to take initiatory control. These extra barriers are the same as the barriers that plague initiatives to create consensual alternatives.

Nevertheless, the search produced three successful cases that involve the creation of anti-Tayloristic structures in the workplace

- In 1980, the union became involved in technical change at the Pullmax machine tools factory in Ursviken (Sweden). The reported results were: operators handle all CNC programming; they receive orders for a week, and make the detailed planning themselves (Ruskin College 1984: 1-11, Sandberg et al. 1992: 166-177).
- In the machine tools factory of VW (MWB) Union/works council involvement, starting in 1985, led to a shift in policy towards shop floor programming (IGM 1988).

- Reports credit the works council of the Unichema Unilever chemical company in Gouda for achieving job enrichment and participation for operators (Brouwers 1989: 4, Pot et al. 1993: 8).

7.11 Conclusions

Worker-mobilization based policies face four specific obstacles:
- the double trap of technological change;
- the knowledge gap;
- negotiating on qualitative issues is problematic and putting the nego-tiated results into practice is problematic as well;
- difficulty for workers to take initiatory control.

None of these obstacles is necessarily lethal for the initiative, but the cumulative effect makes the chances for success lower than in consensual alternatives.

In addition to this, worker-mobilization based policies aimed at creating new structures in the workplace face the same obstacles that confront consensual alternatives. The implementation of new structures is beyond the policy makers' control (i.e. it is a bridging variable). If worker mobilization is to succeed in bringing about new structures, it needs the support of (a major section of) management.

On the other hand, worker-mobilization based policies for pre-venting further Taylorization need this support to a much lesser extent. This is also an area in which the worker mobilization based policy excels in comparison with consensual policy.

CHAPTER EIGHT COMPATIBILITY OF ANTI-TAYLORISM WITH EFFICIENCY

This chapter focuses on efficiency, a second possible constraint on anti-Tayloristic policy. (The first constraint examined was management power, in Chapter Six.) This variable is included to allow for the possibility that the central assumption on which both enlightenment and worker mobilization rest (the assumption that departing from Taylorism nowadays necessarily boosts efficiency), is incorrect.

In social theory, a culturally pessimistic strand exists, in which the relation between efficiency and humanization is problematic. It rejects the assumption that humanization and efficiency go hand in hand. This approach is most clearly connected to Critical Theory (Alvesson 1987a, b). Instrumental rationality, showing up in mass production and mass consumption, is seen as being so dominant that change efforts directed at the world of work alone are generally useless. It could only make sense to strive after a comprehensive change of production and consumption in close connection, serving not only the quality of working life but also the environment: e.g. through a refusal to buy cars or to buy fast food.

Box 8.1 Clash between efficiency and humanism

In Critical Theory, there is a clear clash between efficiency and humanization. This clash is apparent in, for example, an article entitled "Some implications of modern technology" that Herbert Marcuse published in 1942. In this article, the Third Reich serves as an powerful example to show how extreme the clash can be. Marcuse sees modern industrialized society as a system, characterized by "standardized control, production and consumption". In this system, autonomous, critical reason has lost its meaning and has been transformed into adjustment and "efficient compliance with the pre-given continuum of means and ends".[105]

At the same time, he sees this system as highly efficient.[106]

He alludes to the possibility that the state, if democratically controlled, can conserve human and natural resources, that technology and corporations have tended to waste (Marcuse 194: 432).

But also in a management-oriented text like Mintzberg (1983: 180), one finds the following statement: "As long as society demands cheap, mass-produced goods and services - a great many jobs will remain pretty much as they are now".

Already in Max Weber's work, the clash between efficiency and humanization can be found. For Weber (in Gerth and Mills 1977: 214), the most efficient form of organization is the bureaucratic organization: "The

decisive reason for the advance of bureaucratic organization has always been its purely technical superiority over any other form of organization. The fully developed bureaucratic mechanism compares with other organizations exactly as does the machine with the non-mechanical modes of production." And perfection of the bureaucracy is the opposite of humanization: "[Bureaucracy's] specific nature, which is welcomed by capitalism, develops the more perfectly the more bureaucracy is 'de-humanized', the more completely it succeeds in eliminating from official business love, hatred, and all purely personal, irrational, and emotional elements which escape calculation." (in Gerth and Mills 1977: 216)

This chapter examines the consensual alternatives for indications of efficiency-related constraints.

Because the present study is based on cases of organizations in which anti-Tayloristic policies *are* implemented, it is impossible to completely answer the question to what extent efficiency requirements constrain anti-Tayloristic change. It could always be that in some organizations, efficiency requirements completely prevent anti-Tayloristic ideas to take roots.

8.1 A cautionary note: efficiency is a contextually dependent concept

Do efficiency requirements limit the opportunities for consensual alternatives?

Efficiency is an elusive, subjective concept. It is a contested terrain as well. In 1973, the Philips works council complained that management saw work structuring as a luxury item, and that it overlooked the economic advantages: improvement in quality, less need for spare workers, less overhead (Philips: 1973). In the Halmstad County Hospital, efficiency is a somewhat controversial point as well. In this hospital, the new organization of work requires more nursing staff per ward. This is compensated for by the fact that these nurses take over a number of tasks that had before been performed by others, like taking blood samples and transporting patients. A ban on hiring temporary help compensates for the increase in permanent staff numbers as well. Wards have to solve temporary personnel shortages by adjusting schedules or by borrowing from one another. To some extent, opinions diverge on whether this is efficient. The head of the clinic for Internal Medicine points to the reduction of personnel turnover, resulting from the improved quality of working life, as the decisive factor. This saves costs that are incurred when newly-hired workers are not yet settled in their jobs. However, the head of another clinic is not convinced:

> "If I am short of money, it can be that I go, in some way, back to the old system."

In the new system, doctors do not talk primarily to the head nurse when they want to discuss a particular patient, but instead, have turn to the nurse in charge of the seven bed mini-ward to which the patient belongs. Doctors and nurses take opposing views on the efficiency of this arrangement. Nurses emphasize that information flows more efficiently because doctors are talking to nurses who know the patients well. Doctors on the other hand, emphasize that they are losing time by having to look for the right nurse to talk to. But a nurse who is part of management, notes:

> "Waiting takes a long time when you are impatient."

The old organization of work had its efficiency problems as well. A head nurse explains:

> Often, the nurses sat in their office doing administrative work. But it was not quite clear what they were doing. They made telephone calls and claimed that they were busy, but they could hide there easily and say that someone else should do the work. Now that they are responsible they can't hide anymore."

In Germany, there is a specific line of research called extended efficiency research ("Erweiterte Wirtschaftlichkeitsforschung"), based on the idea that traditional accounting methods are biased towards Tayloristic organization patterns. This involves taking more factors into account, in order to bring the long-term advantages of consensual alternatives to light. This includes criteria like (Reppel 1992: 57):
- flexibility in relation to changed market demands;
- production safety;
- quality;
- flexibility in manning;
- motivation;
- possibility for the individual to influence the work system;
- opportunities for learning;
- ergonomic usability.

Where anti-Tayloristic changes are undone, this is usually not the result of a total collapse of the organization or near bankruptcy; it is the result of a management decision. Therefore, what matters most for the survival of organizational forms is not efficiency as an objective concept, but efficiency as seen by the dominant managers (i.e. contextually dependent).

8.2 Evaluations of efficiency

Most reports on organizational changes contain authoritative statements about the efficiency (or equivalently: effectiveness, productivity, economic viability, performance or "Wirtschaftlichkeit") of the new organization. The combination of these statements with assessments by major stakeholders (primarily managers) yields the following picture:

In 61 per cent of the cases, major stakeholders or evaluators determined that the emergent new organization was efficient. In 11 per cent, efficiency was in some respect problematic, but not to the extent that it caused a reversal of policy. In 6.5 per cent, management found the new way inefficient to such an extent, that it decided not to go ahead with the changes altogether. In 21 per cent, there was no information on efficiency available. Some cases showed a marked economic success:

- A study showed that Opel Hoppmann made better profits than comparable firms. Furthermore, during two recessions, workers accepted unpopular measures (Hoppmann and Stötzel 1981: 34-36).
- In the IHC shipyard, there is satisfaction with the system of teamworking. IHC's Piet Wemmers stated: "At IHC we consider teamworking as something of paramount importance. We started out ten years ago and it clearly contributed to the success of the company."
- The once endangered DAF components factory, where the change process began, bounced back into vitality. DAF did proceed to outsource some components, but on the other hand, it started manufacturing several previously outsourced components, because that proved to be cheaper.
- Felten & Guillaume recovered the cost of the change to production islands and teams in the production of metal parts in three years (Klingenberg and Kränzle 1987: 10).

There is one case in which anti-Tayloristic change was apparently too efficient to be successful. A 1960's Industrial Democracy experiment in the Christiania Spigerverke wire drawing mill in Oslo introduced job rotation and detail planning in a workgroup. This led to a 20% productivity increase. The problem was that this would lead to higher wages for the group members, which was unacceptable for other workers. Group members proposed compensation in time off, but this was unacceptable for management. The project stopped because of this difficulty with the wage system (Thorsrud et al. 1976: 429-431, Bolweg 1976: 57-60).

Several reports indicate a reduced absence through illness. An initiative in a U.K. mine to reduce the division of labor in the 1950's resulted in reduced absence and in a lower accident rate (Trist and Bamforth 1951: 4, Trist 1981: 30). Opel Hoppmann's absence through illness

rate was lower than in comparable firms (Hoppmann and Stötzel 1981: 34-35). At tin can factory TDV, absence increased after the beginning of the change process, but later it decreased to half of the original level. In the Halmstad County Hospital, absence went down.[107] The downside of increased efficiency can be job losses and intensification of work.

Box 8.2 Job losses and intensification of work as the price for increased efficiency

Increased efficiency translates into jobless growth and job losses. For 42 per cent of the cases, there was information available on the effect on employment. In 26.9 per cent of these cases, there was a reduction of employment. This reduction averaged on 26.7 per cent.[108]

To the extent that the balancing losses associated with a Tayloristic organization of production (see Chapter Two) decrease, idle time - sometimes a welcome break - disappears. At the IHC shipyard, a personnel official, formerly a production worker, reports that many workers were reluctant to take on extra duties: "When they had no work to do in their field, they could just sit down on a crate." Workers at Sigma Coatings see it as a disadvantage, that their versatility made interruptions vanish: "When you can't get on with a certain job, and the boss sees it, he can send you to another machine to help, just like that." A workgroup leader says: "They used to have a party in production when there was something going wrong in the filling department."

In several cases, written sources report increases in job intensity. At Felten & Guillaume, the workload had increased as a result of job enlargement and a reduction in personnel (Theerkorn 1991: 234). Berggren reports increased work intensity in several Volvo and Saab plants (in Sandberg et al. 1992: 71).

At the Volvo Uddevalla plant (spring 1990), people were working under great pressure and absentee rates rose to twelve per cent. On top of this, teams had to produce the same number of cars at all times, regardless of the number of people present.[109] However, job intensity did not increase in all cases.[110]

Notwithstanding the many positive evaluations, in several cases there was evidence that decision makers and evaluators felt that the emergent new way of working, wholly or partially, was not optimally efficient.

8.3 The Babbage principle

Ten years of experience in the Zahnradfabrik Friedrichshafen, with a flexible manufacturing system, manned by a semi-autonomous team, did

not lead to diffusion within the company. The main objection was that the system needed highly skilled, and therefore expensive workers. Here we see the Babbage Principle (division of labor makes it possible to hire cheaper workers, see Chapter One) in action.

Box 8.3 Surprising developments: Zahnradfabrik Friedrichshafen

An expert referred me to Zahnradfabrik Friedrichshafen (ZF) as one of the most significant anti-Tayloristic initiatives in Germany. There was a 577 page book on a flexible manufacturing system and corresponding organization of work, that had been developed at ZF, as part of the Humanization of Work program (Schultz-Wild et al. 1986). One of the features was an integration of supervision of the installation, setting up system components, quality control, adjustment of tools, adaptation of NC-programs and creation of work schedules. Among these tasks were not only the typical residual tasks that remain after automation, but also tasks that are usually split off from the operator's job and handled by special departments (Schultz-Wild et al. 1986: 523). Employees worked in groups, each group being responsible for a production island. Workers did not have permanent workstations, tasks were allocated by the group. The researchers, who followed the project over the course of ten years, made a clear statement as to what extent this new system departs from the usual way of working. They found the new system, from the point of view of organization of work, work content, personnel administration and qualification demands, to be "in sharp contrast with the tendencies that have for decades dominated the rationalization of production work" (Schultz-Wild et al. 1986: 519).

When asked about the experience with this flexible manufacturing system, production manager R. Gugenheimer said: "You can forget about it right away". After 1985, ZF abandoned further development of the flexible manufacturing system. The reason were the high wages commanded by the highly skilled operators. This made the system uneconomical. The fact that the system required many robots, aggravated this problem.

After experimenting with the flexible manufacturing system, ZF went in the direction of CIM (Computer Integrated Manufacturing). This was an attempt to use automation to compensate for the high labor costs. CIM required only one-third of the number of operators.

In 1992, a CIM system for the production of gear boxes, divided up over several "islands", was in full use. The production of gearwheels was entirely automatic, including the picking up of rough pieces of steel from crates, inserting the workpiece and taking it out after machining. Initially, there had even been in use a robot for replacing defective tools. This robot proved too expensive to maintain and therefore was put out of service. It had to span distances up to fifteen meters with great precision,

under varying ambient temperatures. In other islands, fully automatic machines mounted the machined gearwheels to other parts by means of shrinking or laser-welding. Every island was manned by three of four workers.

Final assembly of gear boxes involved somewhat more human labor. It took place on AGV's (Automated Guided Vehicles). In this phase, much happened automatically as well. For example, a machine tightened all bolts at the same time. A panel with lights, not unlike one in an aircraft cockpit, indicated if a bolt did not get the correct turning moment. The system had interfaces with CAD (Computer Aided Design), PPS (Production Planning System) and CAP (Computer Aided Production) systems.

"The system works well", said R. Gugenheimer, "but in the beginning there were terrible problems. They used the same planning system as used in the USA for the production of cruise missiles, but nonetheless more than 2000 errors showed up. The CIM system is not economical. The capital costs are too great. Furthermore, one needs many *mechatronics* engineers to keep the system going. [In the days when this was planned] people thought that the future belonged to the automatic factory. An important example was an automatic Mazda factory. Later, it became clear that Mazda had too much money and that they put that into technical toys to see what was technically possible."

A third era dawned when ZF engineers had the opportunity to see inside a Japanese gear box factory: "One man operated seven or eight machines and they worked like ants. In Europe you can not introduce this in one sweep, it has to happen step by step. The Japanese factory was only half automated. Robots were simple, making them easier to program."

This experience led to a third phase at ZF: HIM (Human Integrated Manufacturing). The aim is to combine the "good elements from the Japanese way of working: the lean aspect and segmentation". The intention is to organize half of the work in the form of islands, the other half in workshops. It is the intention that team members help one another, take care of small repairs and stand in for absent workers. A new wage system will reward mutual helping, something which the current piece-rate system does not do. Costs will have to go down twenty percent. "The Japanese make the world go crazy", says R. Gugenheimer, "Over there, work is the most important value, they are workaholics."

At DAF Trucks, in the beginning the idea was that all team members must be capable of doing all the work, including CNC programming. The main reason for letting this idea slip away was that it was expensive. Again we see the Babbage Principle in action. At least in these cases, there seems to be a point beyond which further job enrichment is not profitable. (See Fig 5.1.)
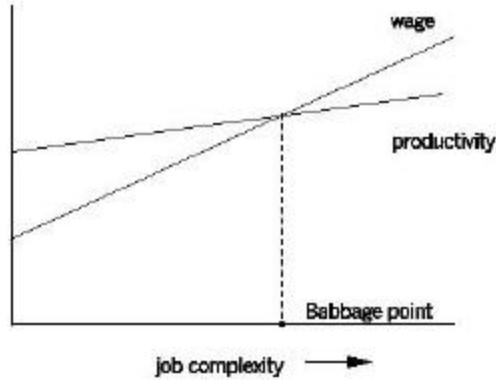
Fig. 8. 1 The Babbage principle as an obstacle to job enrichment

The Babbage Principle can be an underlying factor that is not obvious at first sight. Change projects in mail terminals stumbled across what appears to be an inherent simplicity of work. Sorting mail is by itself shortcycled work. Automation can eliminate the handling of mail, leaving only manual coding of postal codes to workers. This makes the work even more short-cycled than it had previously been. Gustavsen, Hart and Hofmaier (1988: 23) found that this was an obstacle to change:

> "There has been a movement towards group based work and more participation oriented forms of supervision and management. It has also become clear that there are limits to what can be achieved through changes in work organization under present conditions of work and technological development in large mail centers. A lot of simple work is still present and any amount of rotation or other ways of redistributing tasks have their limitations in terms of the ability to turn this type of job into 'the good work'."

This obstacle, that appears to be inherent, unavoidable simplicity, is one of efficiency. It would surely be technically thinkable to eliminate this coding job and to add some coding work to many other jobs in the postal service. All-round employees in post offices could, as part of their job, collect letters from letter boxes, and code the addresses onto machine-readable tags or labels. Sorting mail in post terminals could then proceed entirely automatically. Attempts to organize the postal service in this way

efficiency

are likely to face the Babbage Principle obstacle. This principle is so much internalized that radical reorganization does not often appear as an option, not even in scholarly texts. It simply does not pass through the subconscious anti-utopianism filter.

8.4 Comparative technical advantages of Taylorist systems

Volvo Kalmar abolished dock assembly because it became inefficient. The number of different car models was increasing, so that the stocks of components which had to be kept at the dock were becoming too large. Furthermore, the production pace had increased to such an extent that dock assembly-connected disruptions of the production process had more serious consequences (Agurén et al. 1984: 41). This is remarkable, because it is generally assumed that increased product variation makes Tayloristic systems less efficient.

In the Mercedes-Benz plant in Bremen, there is dock assembly in some places. Moreover, management is committed to developing team-working. However, regardless of this commitment, at Mercedes-Benz the assembly line concept remains firmly entrenched. In the process of revamping a hall for the production of the new C-class cars, management even introduced new assembly lines. The reason being that management sees abolishment of assembly line production as not economically viable. The lean production idea plays a role here.

DAF Trucks experiments with dock assembly for the external completion of engines. However, assembly of the interior parts will continue to take place on an assembly line, because of the use of expensive machinery.

Among the work structuring projects at Philips, there was one that did not survive because of long learning times (Den Hertog 1975: 111-114).

In some cases, managers and engineers see Taylorist systems as an efficient starting point for future automation. This point of view impeded diffusion of semi-autonomous teamworking in the U.K. coal industry (Trist 1981). It is also present in the ongoing discussion on the merits and faults of the assembly line concept in the car industry (Berggren 1989: 177).

Box 8.4 Controversial Point: Is the assembly line the pinnacle of efficiency in the automobile industry?

Controversy surrounds the efficiency of Volvo's innovative Uddevalla plant, which, together with the Kalmar plant, was closed down in 1993. As indicated earlier, the main driving motive for the innovative organization

of work was to ease recruitment difficulties through offering attractive jobs. Indeed, by 1990 Volvo Uddevalla had managed to recruit 900 employees (41 per cent were women). But it should be pointed out that Volvo's wages were higher than those paid by other metalworking companies in the region. However, in terms of efficiency of production, the success is controversial. In 1990 the assembly of a car in this plant took 50 - 55 man-hours. The aim was to reduce this to 23 man-hours when the factory would be completely ready. There was certainly still a long way to go. In "The machine that changed the world", Womack, Jones and Roos (1990: 102) argue that with a twenty man-hours assembly time, a "neo-craft" based plant like Volvo Uddevalla could not compete with lean plants. The leanest plant in their survey managed to produce (simpler) cars in 13,5 man-hours, including welding and painting. But in November 1992, a spokeswoman from the factory said that the plant was on its way to becoming more efficient than the assembly line based plants in Torslanda and Ghent. She added that she saw the Uddevalla system as a kind of lean production too. According to A. Sandberg (1993: 84), Uddevalla had in 1992 reached the level of productivity of Torslanda.

The fact that Volvo's management decided to close down Uddevalla and Kalmar, and so to concentrate car production in Torslanda (Gothenburg) does not prove that these plants were inefficient. The background for the decision to close Uddevalla and Kalmar was an undisputed need to reduce capacity. Publicly given reasons for the choice were the savings earned by not transporting bodies from Gothenburg to Kalmar and Uddevalla, and the management, administration and facility costs caused by having three plants instead of just one. These reasons do not touch the Uddevalla production system. An additional explanation put forward by the spokeswoman of the Uddevalla plant, is that management and union power is concentrated in Torslanda, the hub of the company. Therefore it is understandable that jobs are saved in Torslanda and not in peripheral plants. In fact she argued, as did Sandberg, that the flexibility of the Uddevalla plant, making it possible to produce to order and allowing for last minute changes, would give it the edge over Torslanda.[111]

Much controversy over efficiency had at its core the question, how wide or how narrow one should define the concept.

The experiment with dock assembly of engines, instead of using an assembly line at DAF Trucks gives rise to this question. "It is difficult to prove that dock assembly is as effective", says A. Coppens. "You just have to shop further away to get parts, and each and every part has to be handled twice. In order to assess whether it is as effective as the assembly line you would have to measure in an integral way. You would have to include for instance absence and wastage."

Since Adam Smith no one will be surprised to see series size as a variable in the equation that determines the comparative efficiency of Taylorist systems. A study on group assembly of engines at Volkswagen concluded that this was only efficient for a production volume of less than 300 engines per day. VW determined that, being a mass producer, group assembly was not an alternative (Granel 1979: 45-46). Commenting on change projects in the clothing industry, management representative G. Paß (1981: 20) concluded that team structures had not proved themselves in the production of large series.

8.5 Shiftwork

When efficiency requirements dictate shiftwork, they obstruct effective teamworking. When a team is divided into two shifts, collective decision-making is difficult, because at any given moment, at most only half of the team members are present. A partial solution might be to spend time together at midday. This however, leads to increased labor costs. It is difficult to prove that these hard costs are compensated for by more efficient teamworking. A second shiftwork-related complication occurred at Holec, where the works council is opposed to overlapping presence because this would decrease shiftwork pay supplements.

An alternative to dividing teams up over shifts is to make each shift into a team. This is the case at the Avebe Foxhol food processing plant in The Netherlands. Felten & Guillaume has this arrangement as well, that two teams work in the same cell alternately. The problem with this arrangement is that the planning of a single production process can hardly be divided up among different teams.

On the positive side, in some workplaces, supervisors generally work in the daytime only, leaving some autonomy to the late shift. (An example of this is Sigma Coatings in Amsterdam.)

8.6 Streamlining and speedups

Streamlining systems to the utmost and speeding them up (which occurs as part of *systemic rationalization* (Altmann et al. 1986) or lean production), goes against decentralization of responsibility and job enrichment. Decentralized decision-making requires some form of decoupling between segments in a labor chain, for example, through buffers. Streamlining seeks to eliminate buffers. Speed as such makes job rotation an unlikely proposition.

This was the experience in the redesign process at the ECT Home Container terminal, where the speed of loading and unloading vessels had absolute priority over other considerations (Van Klaveren 1989: 70).

When ECT designed its Delta 1 Terminal (which became operational in 1984), one of the aims was offering interesting jobs in semi-autonomous teams.

In 1986 and in 1989, the works council commissioned evaluation research on the quality of working life at ECT. The researchers found "one-sided specialization" and "monotonous work" (Van Klaveren 1989). The semi-autonomous teams did not function as intended. In some locations, workers complained about information systems that prescribe their actions on a step-by-step basis, making them feel like "coolies". Operational workers said that they do not perform any planning, since the order of loading and unloading is determined by process control. An information system has taken over planning tasks that were formerly done by humans (Bouwman, Van Halem and Van Klaveren 1989: 10-19).

In an interview, the chairman of the works council remarked: "These systems are no information systems, but rather command systems."

The problem was worst in the part of ECT that works exclusively for one shipping company, Sea-Land. This company determines the order of loading and unloading, and thus most of the planning itself, feeding this information into the ECT systems through EDI (Electronic Data Interchange). This precludes adding planning activities to operational work in the section that works for Sea-Land. One of ECT's managers wrote:

> "The lesson to be learnt from the Delta terminal is, that with all the good intentions that we have, we must pay heed to avoid that the work becomes too monotonous. The system should not too much dictate the individual actions of people."[112]

According to the works council's consultants, the emphasis on loading and unloading ships as fast as possible was an important cause of these problems (Van Klaveren 1989: 70). The quay cranes are able to load sixty containers an hour or more into a vessel. This dictates the pace at which containers must be delivered at the crane, no matter where on the terminal they might have been stacked.[113]

Due to the required speed of operations, it was customary to allocate work in a hurry, without thinking about rotation. A kind of unwritten law crept in, allowing people to stick to their preferred jobs while leaving the less popular jobs, in which one is exposed to the wind and the rain, to temporary workers.

8.7 Summary

Efficiency is not a clear-cut issue, but in most cases major stakeholders or evaluators were satisfied with the efficiency of the new organization. Several structural limitations related to efficiency surfaced. The Babbage Principle continues to limit job enrichment. Furthermore, among managers, the idea persists that the assembly line concept points the way to efficiency. This applies especially, but not exclusively, in the case of large uniform series production. Besides, managers tend to view assembly line production as an efficient step towards full automation.

Shiftwork, speed-ups and streamlining of work-flows, dictates in the name of efficiency, damage initiatives to break with Taylorism.

CHAPTER NINE GOVERNMENT ENFORCED STANDARDS FOR WORK ORGANIZATION: PUSHING HUMANIZATION BEYOND THE BOUNDS OF EFFICIENCY?

It seems unrealistic to expect companies to implement anti-Tayloristic policies that run counter to efficiency (as seen by management). In such cases, enlightenment can do no more than try to instill in managers an enlightened view of efficiency. Furthermore, unions will generally not mobilize workers for a policy that impairs the vitality of the companies that they work for. Where anti-Tayloristic change runs counter to efficiency, a last resort could be state intervention in the world of work through legislative action. If quality of work and efficiency do not go hand in hand, the only possible way to reform is by state enforced standards that hit every competitor equally. At this point there is an analogy to environmental policy.

Such standards first came into existence in Norway. The Norwegian 1977 Work Environment Act has a section on "planning the work" that amounts to declaring Taylorist practices unacceptable. The intention was to enable the Labor Inspection to get itself involved in the organization of work. In Norway, changes in production processes that significantly impact the working environment are subject to Labor Inspection approval. In the 1990's Sweden[114] and The Netherlands followed Norway's lead.

Box 9.1 Some provisions on work organization

From the Norwegian 1977 Work Environment Act,
Section 12, Planning the work:

1. General requirements: Technology, organization of the work, working hours and wage systems shall be set up so that the employees are not exposed to undesirable physical or mental strain and so that their possibilities of displaying caution and observing safety measures are not impaired.
Conditions shall be arranged so that employees are afforded reasonable opportunity for professional and personal development through their work.

2. Arrangement of work: The individual employee's opportunity for self-determination and professional responsibility shall be taken into consideration when planning and arranging the work.
Efforts shall be made to avoid undiversified, repetitive work and work that is governed by machine or conveyor belt in such a manner that the employees themselves are prevented from varying the speed of the work.

Otherwise efforts shall be made to arrange the work so as to provide possibilities for variation and for contact with others, for connection between individual job assignments, and for employees to keep themselves informed about production requirements and results.

3. Control and planning systems: The employees and their elected representatives shall be kept informed about the systems employed for planning and effecting the work, and about planned changes in such systems. They shall be given the training necessary to enable them to learn these systems, and they shall take part in planning them.
(From Gustavsen and Hunnius 1981: 198-199)

From the Dutch Working Conditions Act (1990): "Monotonous and short cycled work, and work paced by a machine or an assembly line in such a way that the employee cannot control the pace, must, as far as can be reasonably demanded, be avoided. [..] As far as can reasonably be demanded, work must contribute to the craftsmanship of the worker; the employer must design the job in such a way, as to offer the employee sufficient opportunities to carry out his work according to his own insight [..]."

The European Community Directive 90/270/ECC of May 29, 1990, contains clauses that imply a restriction on some computer-based disciplinary mechanisms:
- The employer must plan the worker's activities in such a way that daily work on a display screen is periodically interrupted by breaks or changes of activity.
- Systems must display information in a format and at a pace which are adapted to operators.
- Without the knowledge of the users, quantitative or qualitative control mechanisms may not be used.

The key question is, was there any success in trying to force changes on those employers who, for the sake of efficiency, preferred to stick to Taylorism?

"With enthusiasm, the Norwegian Labor Inspection started to implement the law", said trade unionist B. Willadsen (LO), "but gradually the labor inspection came to feel that the problem was too big for them. When they would tell an employer that a certain job was too monotonous, the employer would say 'what is monotonous work? There is no norm.'"

Soon, attempts to use the law as in instrument to force employees to change the organization of work came to a complete standstill.

In 1995, Thoralf Qvale of the Norwegian Work Research Institute, who had been involved in working life reform form the 1960's onwards, indicated that:

- The law did not function like a traffic code, suppressing undesirable behavior. It was more like a point of reference.
- There were no cases to be found in which the law forced managers to change policy.
- The law was used exclusively in the context of development programs.
- At the time when the law was drafted, there was an informal understanding between employers and unions that the real meaning of the law was different from the literal meaning.[115]

Observers pointed to several weaknesses of the coercive, standards based approach. Following Gustavsen and Hunnius (1981: 115-141), it is possible to identify three types of weaknesses:

- Lack of clarity in the law-text.
- Fundamental obstacles: the difficulty to prove that a given level of stress or monotony is harmful; the multi-causality involved in the organization of work; the long-term nature of the changes required; the inability of the social sciences, as opposed to the natural sciences, to produces threshold values that can be used as standards.
- Dysfunctions: the use of standards runs counter to the idea that each and every workplace needs improvement; reliance on standards entails the risk that improvement efforts remain restricted to areas for which it is technically possible to generate standards; standards can cause development to freeze. "We do not want standards", said LO's Bjørn Willadsen, "we want local activity."

The Norwegian legislators themselves had serious doubts about the possibility of a coercive effect on the organization of work. Therefore, they aimed for a second additional effect: the promotion of local activities, i.e. consensual alternatives or independent local union action. To this end, the law demands, in firms with over fifty employees, the establishment of working environment committees that participate in company planning and that monitor employee welfare (and health and safety issues).

The idea seems to be, that if labor legislation cannot enforce certain principles of job design, it can at least enforce procedures that promote and facilitate joint management-labor initiatives to change the organization of work. In this way, a repressive approach - i.e. labeling certain practices as illegal - is supplemented by a procedural approach - putting demands on the procedures that companies follow when designing jobs. However, the repressive side of the law remained dead letter.

In The Netherlands too, the repressive route remained untraveled. Dutch Working regulations require companies to obtain the services of Working Conditions Agencies ("Arbodiensten"), primarily to deal with absence through illness. These Working Conditions Agencies, in turn, are

required to employ organizations experts. The reason for this set-up was to expose companies to enlightened ideas.

There is some evidence that standards might not only stimulate consensual alternatives, but could also enhance the possibilities for worker influence. In their attempts to influence the design of ECT's Delta II terminal, the works council referred to the Working Conditions Act to bolster their arguments.

9. 1 Conclusions

The strategy of enforcing standards pertaining to the organization of work was hardly put to a test. Immediately after their conception, the viewpoint that repressive standards on the quality of work are irrelevant got the upper hand. What remained alive was the notion that standards could improve the conditions for enlightening managers about the virtues of humanization of work.

Government enforced standards on the organization of work clearly show that governments are not only easing the way for modernization, but were also trying to modify the fundamentals of the employment relation, by introducing the criterion of self-development of workers.

CHAPTER TEN A FINAL NOTE ON ANTI-TAYLORISM

When we compare the different types of policy, it is clear that consensual policy, i.e. consensual alternatives propelled by enlightenment, is most effective. In the first place, more happened in the consensual stream than in the other streams, and the level of success was markedly higher. Nevertheless, not all was well in the consensual stream.

Box 10.1 A few tough challenges

- Starting experiments to radically de-Taylorize jobs in the fast food industry.
- Finding alternatives for those computerized control systems that strongly discipline workers.
- Creating technology projects that are anti-Tayloristic, lead to marketable products and to real change on the level of the shop floor.
- De-Taylorizing jobs in organizations characterized by speed-ups, systemic rationalization and shift-work.
- Mounting a frontal attack on the assembly line (note that the assembly line is making a comeback).
- Building diffusion networks to enhance the social movement aspect of change (this presupposes that management is prepared to give the innovators in their organization leeway).
- For nations like The Netherlands and the U.K.: catching up with Scandinavia and Germany in institutionalizing humanization policy.

The second reason for considering the consensual stream to be the main stream is, that the worker-mobilization based stream developed as a reaction to the consensual stream, and later merged with the consensual stream.

Thirdly, the standards-based stream did not lead to a direct impact on the design of jobs, but it turned out to support the consensual stream.

A few line changes in the conceptual model (fig 10.1) reflect the findings.
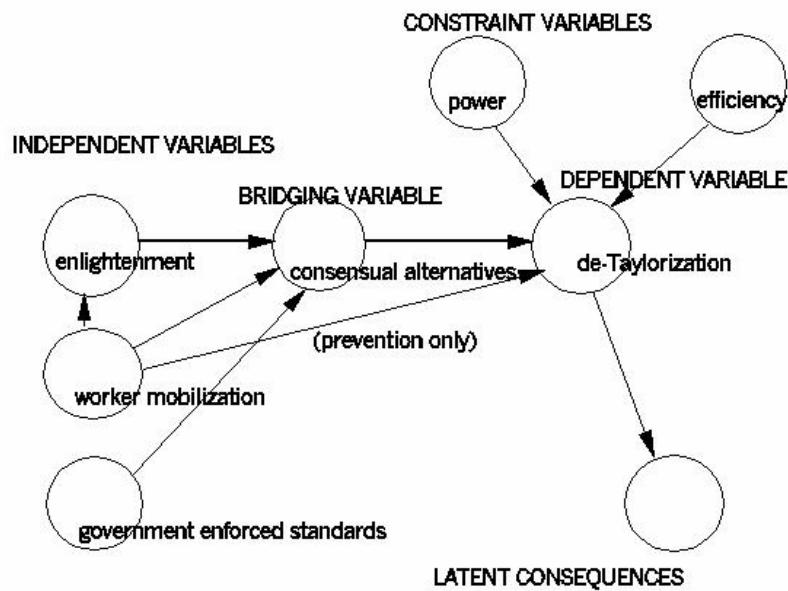
Fig. 10. 1 Findings illustrated in conceptual model

In the new model, there still is a direct line between worker mobilization and the dependent variable. However, worker mobilization only has a direct effect on the design of jobs in terms of prevention of further Taylorization. (Prevention is a weak point for mainstream anti-Tayloristic policy.)

Worker mobilization based policies that aim to create new structures in the workplace do not necessarily fail. But they cannot succeed unless they transform themselves into consensual alternatives.

For example: it will be hard for any union to match or better the level of mobilization shown in the Swedish Postgiro case or the level of technical expertise the union brought to bear on the design of the Skånemejerier dairy in Malmö. Still, in these two cases, the attempts to create semi-autonomous teams failed, because there was no consensus with management.

As far as the creation of new structures in the workplace is concerned, worker mobilization can contribute by shaping the right context for consensual alternatives to appear. Especially when management is divided along pro- and contra-Tayloristic lines, there are opportunities for this. For managers, a double uncertainty surrounds the efficiency question: there is no fixed definition of efficiency, and the judgment about the many variables involved must necessarily be subjective. This uncertainty opens the way for controversies among managers, and hence

opportunities for unions/works councils to try to tip the balance.[116] Furthermore, changing the conception of efficiency among managers is one of the enlightenment goals.

Worker mobilization can set the scene for social-movement like developments in organizations (for example in the Swedish Postgiro case).

In several instances, worker mobilization had a stimulating effect on the development of enlightenment programs.

Finally, we should not forget that unions are, at least in Scandinavia and in Germany, strong partners in enlightenment efforts and consensual alternatives. Therefore, investments by unions in independent build-up of knowledge and expertise are safe: when worker mobilization based policy fails, these investments enhance mainstream policy instead.

The direct line between government based standards and the dependent variable tends to evaporate as soon as it is drawn. Explanations are the dominant value system and the lure of consensual policy. But still, standards are not irrelevant. Standards can lay down procedures that cause managers to be exposed to enlightened ideas. Furthermore, standards constitute moral signposts, upholding values other than those commanded by efficiency and competitiveness. Demonstrably, such values play a role in the genesis of consensual alternatives. In this way, standards could be allies of critical thought, which is frequently brushed aside by the cheerful imperialism of instrumental reason.

10.1 General theory of anti-taylorism

Cross-cutting the various strands of research on post-Taylorism, the main paradigm is clearly modernization. This means that moving away from Taylorism is seen as adapting to a progressively changing environment. The implication is that more flexibility and employee commitment is required. The ongoing development of (information) technology is seen as a factor that makes traditional job design obsolete.
We can locate in this paradigm old prescriptive theories of organizational redesign (Theory Y, emphasizing intrinsic motivation) and new ones (Modern Integral Sociotechnical Theory, stressing flexibility). But also descriptive research on the development and spread of "New Production Concepts" fits in this paradigm. Even critical authors who attack humanistic claims about job redesign and seek to demonstrate that it is just economically based adaptation to fluctuations in the environment (e.g. Kelly 1982) stay inside the modernization paradigm.

There are critical theories that lie outside the modernization paradigm, but these authors tend to make assumptions that are difficult to accept: Ramsay (1985) sees job redesign as a response to political unrest. But in the period studied, upheavals have been rare. Furthermore, job redesign has flourished in politically quiet countries, especially in

Scandinavia. Then there are Marxists who do little to avoid the impression that they define change as cosmetic, unless it contributes to an overthrow of capitalism.[117] Finally, there are those who stretch the concept of control to embrace almost everything, and thereby see anti-Tayloristic developments as another form of management control, period (Doorewaard 1989).

While exploring the corners of anti-Tayloristic policy and its effects, I found several indications that confirm that anti-Tayloristic policy is modernization:

a) The need for flexibility was often an impetus for introducing change in the organizations.

b) Inside consensual alternatives, there was intensive redesign activity towards flexibility.

c) The most visible body of theory to support redesign efforts - Modern Integral Sociotechnical Theory - is geared towards enhancing flexibility.

d) Government enlightenment programs officially aimed to increase competitiveness of industry.

e) Results in terms of efficiency have often been satisfactory, indicating that, in many cases, change did lead to a better adaptation to a turbulent environment, i.e. that modernization did occur.

However, there were some findings that did not support modernization theory, but that were much more compatible with a view of anti-Taylorism as a way of coping with the immanent characteristics of the employment relation:

• Besides a drive for flexibility, humanistic values played a part in the genesis of consensual alternatives. Humanistic motives for job redesign are more easily seen as reactions to the unease, that the immanent characteristics of the employment relation cause to managers. This effect gets an extra impulse during periods of full employment when workers avoid those jobs in which the pressure of the employment relation appears in an unmitigated form.

• Anti-Taylorism is not the only solution for achieving flexibility. Why do some managers, who want flexibility, choose the anti-Tayloristic route?

• Social movement like processes can play an important part in organizational change. Since they involve taking control of the organization of work, they are in opposition with the characteristics of the employment relation.

• Government enlightenment programs not only aim to increase industrial competitiveness, but they are at the same time a continuation of a long line of policies to protect employees from damaging aspects of the employment relation.

• Particularly puzzling from the point of view of modernization is the occurrence of regression on a wide scale. One would expect resistance

to change. But when anti-Tayloristic change indeed means adapting the organization to turbulence in its environment, one would not expect regression to more Tayloristic forms to occur. Regression is more compatible with the view that anti-Taylorism is one of the fluctuating ways to cope with the immanent tensions produced by the employment relationship.

- In many cases, unions (and works councils) supported anti-Tayloristic change, working together with management in consensual alternatives and enlightenment programs, and sometimes attempted to race ahead of management in independent union actions. Unions are not noted for their enthusiasm for flexibility drives; their involvement is more readily explained as part of their long-standing function to make the employment relationship more bearable for their members.
- The introduction of the criterion of self-development of workers in government regulation is not compatible with the economic rationality of the modernization paradigm.

The conclusion is that anti-Taylorism is not only adaptation of the organization of work to progressively changing conditions, but that it is also the result of a need to find new ways of coping with the immanent, pervasive characteristics of the employment relation.

The duality of anti-Taylorism may go some way to explaining the uneasy, unstable, uncertain development of working life. When organizations try to modernize, it is by no means certain that this is matched in the ways employees and managers are coping with the employment relation. Employees may happen to cope with the employment relationship by putting up active passivity inside Taylorist patterns. Attempts to break this bind might just as well increase employee resistance. Managers have the option to cope with the unease that emanates from the employment relationship by indulging in an overkill of power. The modernization efforts might just as well reinforce these coping behaviors. The structural characteristics of the employment relation continuously lead to problems that cannot be solved, only be coped with, in varying and often contradictory ways.

APPENDIX A   Analysis of the relations between the alleviation of technical discipline, job enlargement, job enrichment, decentralization of responsibility and participation.

The result of the (homogeneity) analysis is in Fig A.1. The size (surface) of the bubbles reflects the number of initiatives at a given data point. The total number of cases is 62. The labels (in the format "ALRDP" are the scores on the variables **A**lleviation of discipline, job en**L**argement, job en**R**ichment, **D**ecentralization of responsibility and **P**articipation. Where a character is displayed, this means "attempted", underscores ("_") signify "not attempted".

For example: "_LRD_" means: no attempt to alleviate technical discipline, there was an attempt at job enlargement, job enrichment, decentralization of responsibility, but no attempt to introduce participation.
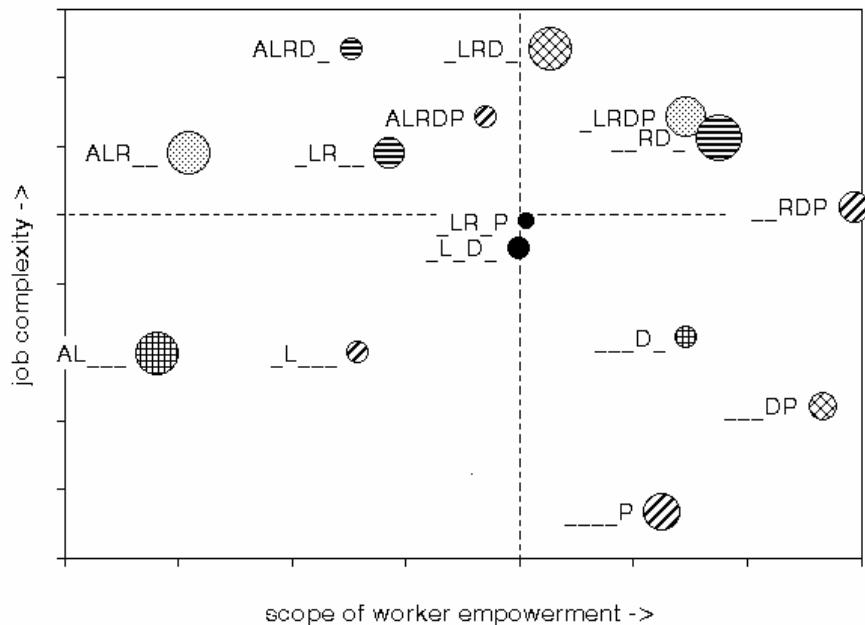
Fig. A. 1 Homogeneity analysis

This analysis revealed two dimensions. The first dimension (showing the highest eigenvalue) is of interest for the present discussion. This dimension is the scope of worker empowerment. At one extreme, there are efforts to give workers some control over their own movements through the relaxation of technical disciplinary mechanisms like machine pacing. Next comes job enlargement (adding more tasks of the same order of complexity), making possible some freedom of movement. Beyond this point, alleviation of technical discipline disappears, while decision making

power becomes the focal point. First there is decentralization of responsibility, i.e. the worker can make (some) decisions regarding his or her own tasks. Then, at the far end of the spectrum, there is participation. In participation, the scope for worker empowerment is the work process at large.

The second dimension is job complexity. At any point along the first dimension there are cases that involve job enrichment and cases that do not.

Technical explanation

The consensual alternatives differed vastly in terms of what the proponents were trying to achieve. To look for a pattern in this, I applied homogeneity analysis to the 62 consensual alternatives that had no missing values for alleviation of technical discipline, job enlargement, job enrichment, decentralization of responsibility and participation. Homogeneity analysis, alternatively known as multiple correspondence analysis, is an exploratory technique for investigating relations between nominal variables.

The program HOMALS is a readily available implementation of this technique (SPSS inc. 1990: B49-B62, Van den Berg 1986). HOMALS can transform a data matrix into a plot showing similarity and dissimilarity between cases. The program assigns values - object scores - to cases in such a way, that cases with similar score patterns on the variables appear as close to each other as possible. Fig A.1 is a plot of these object scores (i.e. scores on the two dimensions) of the 62 cases.

The object scores were the basis for Fig A.1. (This plot was mirrored on the X-axis to make it more readily understandable.)

In addition to this, HOMALS calculates "category quantifications". A category quantification is the average of the object scores assigned by HOMALS to cases that belong to the category in question. For instance, the X-axis value of "no enrichment" is the average of all X-axis values for cases that have the score 0 on the variable "job enrichment". Fig A.2 is a scatterplot of the category quantifications. This plot was also mirrored on the X-axis.
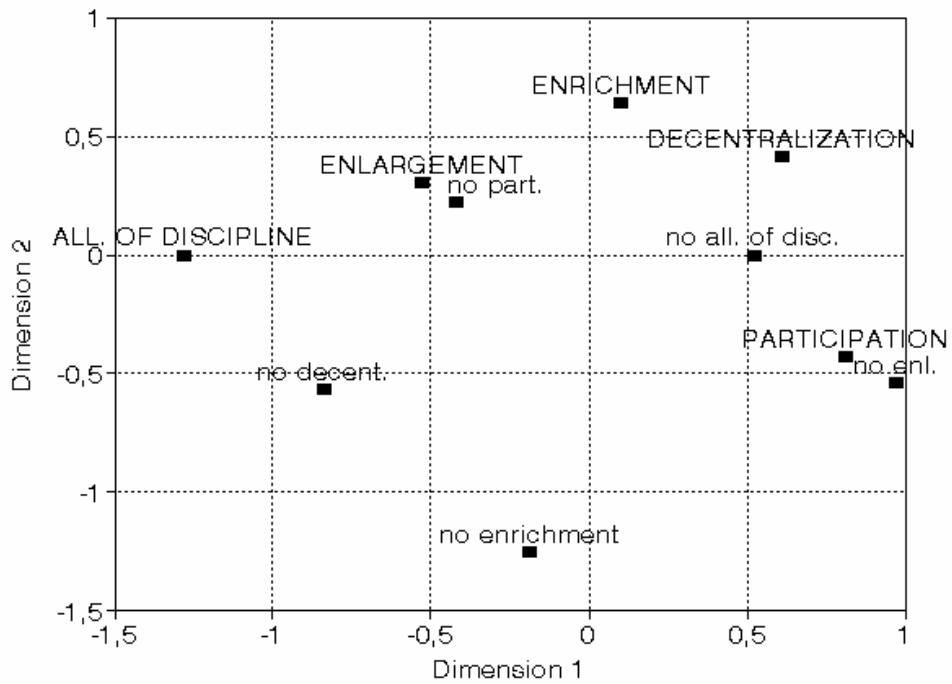
Fig. A. 2 Category quantifications labeled with the category values

In this analysis, interpretation of the dimensions (analogous to factor analysis) was fairly straightforward. HOMALS provides discrimination measures that are useful when trying to arrive at an interpretation.

	First dimension (scope of worker empowerment)	Second dimension (job complexity)
Alleviation of discipline	0.669	0.000
Job enlargement	0.519	0.163
Job enrichment	0.018	0.803
Decentralization of responsibility	0.507	0.238
Participation	0.339	0.095

Job enrichment loads nearly exclusively on the second dimension, while the other variables load more on the first dimension. Job enrichment measures whether or not the changes in work organization involves an increase of the required skill level. Alleviation of discipline, decentralization of responsibility and participation clearly measure the power aspect of the changes in work organization. Job enlargement can conceptually fit into this dimension as well. The order along the X-axis of the category

quantifications alleviation of discipline, job enlargement, decentralization of responsibility and participation suggests that cases can be perceived as located along a scale that runs from alleviation of discipline to participation. The eigenvalues, indicating how well the data are described, are 0.4105 (dimension 1, scope of worker empowerment) and 0.2599 (dimension 2, job complexity).

ENDNOTES

[1] The terms "anti-Taylorism" or "anti-Tayloristic" are used by Dankbaar (1986), Cressey (1987), Buitelaar, Kanters and Smits (1987:28) and Mok (1990: 149).

[2] Steijn and De Witte (1992: 299) write: "In case it is considered desirable that technological innovation leads to improvement of the quality of working life, the relevant social actors (for example state, management and workers) will have to develop a strategy in order to attain those effects. Because of the declining autonomy in the job content of large numbers of jobs, that we found, this effect does not come 'automatically'."

[3] De Sitter (1981: 23). Brouwers, Buitelaar and Verkerk concluded in a 1988 study that in The Netherlands 250.000 people (around four per cent of the working population) performed tasks that repeat themselves within 90 seconds.

[4] Marieke de Vries, "Zusterpost 3 oost" in Aaneen, april 18 1992: 12-16.

[5] Wolfson et al. 1992: 21 and NRC Handelsblad january 14, 1992.

[6] Paul Reinshagen, "Blinde ambities. Volgens Langdon Winner moet het innovatieproces weer worden gepolitiseerd." in Intermediair October 26: 1988. John Sterlicchi, "De ultieme controle van Bigg Boss", in Telecommagazine, september 1993: 16.

[7] Hans Moleman "Bij Ahold rijden ze de plooien uit je broek", Volkskrant november 29 1986, 37.

[8] Huijgen and Pot 1987. A study of the qualitative structure of employment in the Netherlands also indicated that there was polarization (Huijgen, Riesewijk and Conen 1983).

[9] From the anti-Tayloristic side, one reaction to lean production is to argue against it. For an empirically founded critique, see Berggren (1993). A totally different reaction is to embrace the term "lean production" while redefining the concept. To project consultant professor Pornschlegel, the non-Tayloristic approach at steel grid factory STACO was lean production before the term existed (Lauenstein and Stapelmann 1992, 97).

[10] The three different theoretical perspectives relate to Alvesson's (1987) three paradigms: Consensus, Control and Critique.

[11] Furthermore, the application kept track of text files concerning interviews and data obtained from documents. Finally, it supported project management.

[12] This in one element in Kelly's more complex theory of job redesign.

[13] Productive and non-productive labor are analytical categories. In practice, they can be combined.

[14] cf. Baldamus 1961

[15] Volkskrant, February 5, 1996: 2

[16] Thorsrud et al. 1976, 436-438, Bolweg 1976, 65-70. The motives of management and the motives of the local union were very different. The workers feared job losses and were dissatisfied with wages. Management wanted to put an end to "overmanning", restore profits and improve management-labor relations. These opposing forces gave rise to a package deal consisting of job redesign, with a financial incentive for learning, a reduction through natural wastage and a productivity agreement.

[17] Coupled to this is: "continuous improvement (kaizen), not only in production but also in the office".

Tayloristic control gives rise to bureaucracy. An example is the ECT stevedoring company in Rotterdam. The organization had, since 1970, become ever more bureaucratic, with increasing functional divisions. In its last stage of bureaucratization, the oldest terminal had numbered thirteen different departments, and some of these had as many as seven hierarchical levels. At the lowest level there were 48 different job descriptions. Managers felt that this level of bureaucracy was

inefficient. The designing of a new terminal offered managers the opportunity to try and find less Tayloristic solutions.

[18] In 1980, Felten & Guillaume was in deep trouble. It operated at a loss and mother company Philips demanded a strategy to return to profitability, otherwise they would close down the plant. This pressure proved productive. Earlier rationalization measures had been the introduction of assembly lines followed by automation. But in the early 1980's, the possibilities for rationalization through further automation seemed exhausted.

[19] In contrast to the "system centered" factory, in which it is attempted to plan everything from a central point, Ainger put forward the vision of the "human centered" factory. The human centered factory is made up of different cells, or small factories inside the factory. The workers in the cells are responsible for planning the work that goes on inside the cell, allowing the central planning department to concentrate on meeting the customers' needs.

[20] Staco (Germany). This firm, with around 100 workers, produces steel grids. In this case, an important goal is to modernize the company in such a way as to avoid Taylorist patterns.

[21] Hoppmann and Stötzel 1981. First (in 1961) he introduced profit sharing.

[22] Turnover of 1.4 million containers in 1990.

[23] Fruytier (1986) makes the same observation.

[24] Berggren 1989: 178. Sandberg and others (1992: 96) point to full employment as the main factor explaining the humanization of industrial work in Sweden (in the short term).

[25] Berggren expected that the Uddevalla concept would only be applied to Volvo's factory in Belgium if the Belgian labor market develops in the same direction as the Swedish: less unemployment and greater participation in the labor process, and "increasing articulation of dissatisfaction with repetitive, Taylorized work among workers." (Berggren, 1990).

[26] Some types of impoverished work are conspicuously missing. I did not find initiatives to upgrade the work of bank tellers, fast food restaurant workers or supermarket checkout clerks using scanning equipment. "The best one can do is to distribute the pain," says Pierre van Amelsfoort, a consultant, referring to the work of supermarket checkout clerks. "Some processes are so much made devoid of substance, that there is nothing left over to organize."

[27] At Holec, teams make complete products (with one exception: there is a special team that performs galvanic treatment and powder coating). However, this level of completeness required no deep-cutting reorganization, since there are no products that require both sheet metal working and machining; assembling is done by the client.

[28] Responsible autonomy is a control strategy that is based on granting autonomy to workers. Andrew Friedman (1977) contrasts responsible autonomy to direct control.

[29] Van Klaveren (1989) warns that sociotechnically inspired consultants tend to underestimate this risk.

[30] Unattractive jobs are the Achilles' heel of job rotation schemes. At Staco, systems designers acknowledge that workers are not inclined to rotate to unattractive jobs. Before implementing job rotation, they redesign these unattractive jobs by adding organizing tasks and by providing aids to reduce physical strain. (Lauenstein and Stapelmann 1992: 36)

[31] Ramondt also uses the term "integral learning".

[32] In organizational discourse, this point is often implicit. Some authors make this point explicitly, for example Van Klaveren (1984: 45).

[33] See Van Eijnatten 1993 for an extensive review of the development of the sociotechnical paradigm.

[34] In itself, an expert-oriented approach does not preclude participation. Experts could enhance participation by making actors aware of their options. However, the expert-driven strand of sociotechnical systems design that culminated in the integral school (the Dutch Integral Organizational Renewal approach) gravitates towards

presenting a detailed blueprint model for change, with a fixed sequence of design steps, a "one best way". A "one best way" approach does contradict participation.

[35] A. van der Zwaan (1992: 242) noted that Germany "has never needed any kind of Modern Sociotechnical Theory". My findings corroborate this statement. However, Van der Zwaan states that in Germany, practice and not theory generated new work structures.

[36] However, it would be wrong to infer that blueprints (as often produced by researchers) are a necessary condition for starting a successful change project. The Halmstad County Hospital shows that leeway for internal change agents can be more important than expert-produced blueprints for change.

[37] Oral communication by dr. P. Binkelmann, research director for the Humanization of Working Life / Work and Technology Program.

Researcher W. Baumgarten (1991: 40) notes that in the clothing industry, introducing the ideas of teamwork, job enlargement and job enrichment, was not sufficient to achieve a changeover for monotonous assembly line work to flexible teamwork. He claims that the application of scientific knowledge triggered a breakthrough.

[38] Oral communication by L. Buizert, manager of the Van Nelle's tobacco department in Rotterdam.

[39] One of the methods used in training for participation is the Metaplan method. This method makes use of a board on which users can attach cards with questions and problems. The experience in the Halmstad County Hospital was that this method made it possible for everyone to come forward with his or her opinion, even for those who were not so much inclined to speak up in meetings.

[40] Oral communication by Mr. Kieboom of Holec.

[41] Examples: Klingenberg and Kränzle (all), Joosse et al. 1990.

[42] Plans for knowledge transfer to foundries in the former DDR met with fear for increased competition. However, they were not canceled.

[43] Klotz 1993: 107. The project is unique in a different sense as well. It is a joint project of organizations in Denmark, Germany and the UK. For the UK, it seems the only anti-Tayloristic project of the 1980's. The survey by Cressey (1988) of research projects on technology, labor and organization in the UK leads to this conclusion. This point illustrated nicely the principle of subsidiarity. In this case, European funds helped accomplish something that would otherwise have been impossible in the UK.

[44] Keller 1992,1993. Fuchs and Hartmann 1993. Generally, one of the implications of CNC is the use of encapsulated machines. Encapsulation robs operators of the chance to use their senses to develop their skills. Addressing this issue were German researchers, who believed that the experience of skilled workers is an indispensable factor in automated production. They investigated possible ways to equip encapsulated machines with acoustic and visual feedback systems. The goal was to allow skilled operators to gain experience regarding items like speed and lubrication.

[45] The development of ACiT cost one million pounds. The program was written in Clipper.

[46] There are also projects that aim to develop expert systems as tools for learning and simulation systems to aid in participation. Notably absent is the development of alternatives for logistical systems that treat workers as extensions of the computer.

[47] This example was suggested by the secretary of the MDA program, who did not expect direct results for the program in terms of changes on the shop floor level.

[48] The linear, top down character of the usual methods for systems design is one of the factors that limit the possibilities for real participation. A branch of sociotechnical systems design that addresses this point, is the ETHICS (Effective Technical and Human Implementation of Computer-based Systems) method, formulated by Enid Mumford. In this method, improvement of the quality of working life is an explicit part of the goals. Opinions and wishes of those who are involved determine the

direction of development. (Mumford and MacDonald 1989: 33) Beirne and Ramsay (1987b) studied several cases in which this method was applied. They could not find evidence of real participation by workers. In the report on the development and implementation of the expert system XSEL at DEC (Digital Equipment Corporation) (Mumford and MacDonald 1989), where Mumford had been involved for several years, this evidence is lacking.

[49] He warns that the political decision to exclude large companies from funding and to reduce company projects, make it difficult to put the software products to use that come out of the Work and Technology program (p. 32).

[50] Keller CNC project, PROZOS and ORGAM (the system in use at the Rietbergwerke).

[51] Klotz (1993: 120) cites a statement to this effect originating from the Gartner group.

[52] The German Planleit planning program, for instance, does not presuppose a fixed way of working.

[53] ACiT is relatively slow at executing scheduling algorithms, executing all the algorithms consecutively would take a long time (H. P.).

[54] I mentioned the existence of ACiT during several visits to companies, as well as in a discussion with one of the leading sociotechnical consultants in The Netherlands. In only one company I found a slight interest in the product.

[55] Since the LOM program emphasized communication, the question may arise whether it is fair to evaluate the program in terms of impact in the area of organization. But B. Gustavsen (1992: 69), the program's chief architect, expresses quite clearly that impact on organizations (and technology) is the ultimate goal: "New patterns of communication are, in turn, meant to lead to changes in the way the development work is conducted as well as in the amount of developmentally oriented work which is performed. New linguistic tools to emerge [..] will transform existing processes from being closed and repetitive to being open and innovative [..]. Successively, the processes are to lead to new structures. Such structures can be defined within two main areas: Work organization and technology."

[56] Crosstabulation of Job Enlargement by Subsidy (sixty cases): chi-square test, observed significance level 0.0174.

	not subsidized	subsidized
No job enlargement	4	22
Job enlargement	15	19

Pearson's R is -0.30608. The crosstabulations of Alleviation of Disciple, Job Enrichment, Decentralization of Responsibility and Participation by Subsidy show observed significance levels between 1.0 and 0.6276. Nevertheless, it would be premature to conclude that subsidies have no effect. Cases differ widely in respect of time and place, type of organization and type of intervention. Controlling for these aspects was not possible.

[57] Bosch Werkprojekt 1. Heinrich and Bosch 1982.

[58] A side effect can be bureaucratization. In one case, the Rietbergwerke, there were complaints about the need to produce meters and meters of project documentation. On the other hand, the project agency maintained that this was not required at all.

[59] Another German program is Manufacturing Technology ("Fertigungstechnik"). It is the first technology program that explicitly takes the organization of work into account. The project at ZF started life under the Humanization of Working Life program and later continued as part of Manufacturing Technology.

[60] In 1975, German research minister Matthöfer decided to initiate the development of a government-sponsored model for working in semi-autonomous teams, along the lines followed by Swedish companies like Saab en Volvo. Subsidizing 75 per cent of the costs, he persuaded Volkswagen's management to initiate an experiment in which teams assembled entire engines.

[61] Naschold 1992a: 118, W. Fricke, quoted in Den Hertog and Schröder 1989: 32

[62] Practically all cases were in some way touched by enlightenment activities. The level to which this was the case, varies. At one end of the spectrum, there was massive involvement of an enlightenment R & D program, at the other end of the spectrum, the link consisted of inspiration gained out of publications connected to the enlightenment movement.

[63] Other possible remedies for lack of flexibility within the framework of Taylorism are sophisticated but centralized planning systems, the use of subcontractors and modular design of products.

[64] An example from the Swedish LOM program is job rotation in the department for internal transportation of the Tomteboda post terminal. (Naschold 1992b Anhang C: 108-125, Gustavsen, Hart and Hofmaier 1988)

[65] Functionality tests on the car were not carried out by the members of the assembly teams. This was decided upon because testing requires special knowledge. Finished cars were tested on a roller bank at a central point in each mini-factory.

[66] Skarpelis 1993. In the Vereins- und Westbank in Hamburg, teams may, in consultation with management, experiment with alternative working methods. (Brater 1993: 8)

[67] Job enrichment by adding management tasks implies decentralization of responsibility. On the other hand, the reverse is not necessarily true. There are cases in which it is clear that autonomy increases, while it is unclear whether complexity increases as well. Therefore it is useful to have decentralization of responsibility as a separate concept.

[68] Gulowsen (1972) presents a slightly more elaborate taxonomy and maintains that the items constitute a Guttmann scale. (There is one dimension)

[69] In the LOM project in the clinic for internal medicine of St. Göran Hospital in Stockholm, nursing teams became fully responsible for a fixed group of patients. (Naschold 1992b, Anhang C: 143)

[70] One of the explanations for the Volkswagen's discontinuation of complete engine assembly in the early 1970's is that management lost control over the labor process.

[71] In 1983, Professor Hasenritter of the Fachhochschule für öffentliche Verwaltung (School for Public Administration) began, together with his student Jochem Müller, to develop a dialogue-based supporting system for social security officers. Jochem Müller was a computer enthusiast who had worked as a social security officer in the Bremen area. The project resulted in a program, running on a home computer, that was totally inadequate. This small project led to a large project funded, in part, by a grant of 4,5 million DM from the Ministry for Research and Technology. Before this large project, the social security service of Bremen used batch processing. This system caused delays - sometimes several days - between data entry and output of results. One of the goals of the project was to get rid of the system of batch processing. Another goal was to make the job of the social security officer more complete. This meant that one officer had to be capable of performing all tasks, from registration of data to payment of benefits.

[72] Information sheet "Die Stiftung von Opel Hoppmann", october 1990

[73] Other firms have parallel democratic structures as well. At Volvo Uddevalla, the spokesmen used to take part in production meetings at the factory level.

[74]

Issue	Number of cases	Percentage of total (62 cases)
Prevention of increasing technical discipline	2	3.2

Counteracting the disappearance of human skills and expertise into automatic machinery and information systems	3	4.8

[75] An example is chemical factory Unichema (Unilever) in Gouda. (Elshof and Wetzel 1992, Brouwers, Vaas and Pot 1987)

[76] The five issues were not present in equal numbers:

Issue	Number of cases	Percentage of total (62 cases)
Alleviation of technical discipline	18	29
Job enlargement	40	64.5
Job enrichment	41	66.1
Decentralization of responsibility	36	58.1
Participation	21	33.9

[77] IHC had comparable problems: "There were problems in groups. Some group coordinators were not tolerated by their group members, which means that some will say to a coordinator 'you are not my boss'". At Van Nelle, one of the coordinators was, in the words of the manager, "fanatical". On the average, he was present for nine hours a day. He would tell a coworker, who had nothing to do, to take a mop and start cleaning something. But he announced that he did no longer like to work in this way, because he had almost been lynched by his colleagues, and that he suffered from being accused of playing the boss' friend.

[78] Temporary workers participate in department meetings, albeit without the right to vote. At Holec Hengelo, the aim is to work with as few temporary workers as possible. "It is not efficient when there are always new workers who have to get settled in their jobs", explains a Holec manager "Furthermore, in a team everybody has to be equal. In a soccer team you would not have seven temporary players."

[79] Taylorization within teams is not universal. The experience of A. Coppens of DAF Trucks is, that teams push out workers who take a too authoritarian stance: "It happens that we must transfer the best man out of a team".

[80] There are also contingent opportunities that can be exploited. An example is STACO. In the early 1980's, the works manager left the firm rather suddenly, without training his successor. Therefore the new works manager was not able to do the entire planning right away. As a stop-gap measure, management told workers to come to the office when they were finished with a job. There they had to pick and choose one of the pending orders by themselves, taking into account the type of order and the delivery time. This proved so effective that it became the standard way of working, later supplemented by horizontal coordination.

IHC in Kinderdijk (The Netherlands) is a case in point in which a project on decentralization of responsibility, job enlargement and job enrichment turned out to fit in with a strategy of labor reduction. IHC mainly produces fully equipped, custom built dredging ships and (parts for) dredging equipment. The plant includes a shipyard and a machine factory. In the early 1980's, IHC's personnel manager found that the jobs that the firm offered were no longer attractive for the increasingly qualified workers who were being hired. His discussions with top management resulted in a declaration of intent: rearranging of product groups, the launching of a project "Other Forms of Working" with delegation of responsibility to the lowest possible level, job enlargement and job enrichment. IHC established contacts with sociotechnical action researchers. A graduate student completed a pilot project, and this provided the push to continue on the course towards change. In the early 1980's there was a recession, and in 1986 IHC Kinderdijk found itself without any work. An unwieldy organization made it

difficult to obtain orders. A reorganization took place. The selection criterion was: suitability for the project "Other Forms of Working". Workers who were often ill, who were often late or considered not motivated, lost their jobs. Workers with one-sided abilities, who were capable of only one job like operating one particular crane, went as well. Migrants with insufficient knowledge of Dutch had to go (not all migrants though). For supervisors and foremen, there were three options: demotion to their previous position in production work, promotion to the ranks of management if they were very good, or discharge. A second reorganization in 1987, on the basis of seniority, brought more redundancies. Altogether, the workforce was halved. In 1988 orders increased. This, together with the redundancies caused an increased pressure on the organization that left supervisors no choice but to decentralize responsibility.

[81] Gustavsen and Hunnius 1981: 58-62. They say that the number of direct replications was low. There was diffusion of means, particularly job rotation and wage systems. Sandberg and others (1992: 21) wrote: "Successful experiments were conducted at several Norwegian workplaces, but the expected diffusion did not take place." Janerus (1992: 26-27) indicates that in Sweden, innovations that had proved to be economically viable, did not diffuse as expected.

[82] Research manager W. Büntgen remarked that the power questions are not often dealt with in written reports.

Of course, power holders are also workers who worry about their job security. Power is essentially a multifaceted phenomenon: a) an attribute of positions in the power structure, b) an item that surfaces when analyzing decision-making processes, c) "mobilization of bias" or non-decisions, i.e. the exercise of power by avoiding that certain issues appear on the agenda, d) power in the context of latent conflict (Lukes 1974).

Armed with a multi-dimensional view of power, it is often possible to see power constraints in actions that observers generally label as implementation errors. The Philips Works Council provided a list, including: not enough communication with other departments; too great an emphasis on productivity; sometimes a too central position of the supervisor; doubt among workers and lower staffers about management's real intentions; promised pay scale raises did not come or came late; projects remained in the preparation phase for too long, leading to diminishing interest; solutions from workers did not always meet with adequate reactions; management sees meetings of production workers as a waste of time; too often amateurish guidance; not enough participation.

At Holec, a problem occurred in the creation of teams in the tool-making shop. It turned out that the tool-making shop used to function as a team of thirty people, in which there was mutual helping. When they were divided up over several teams the kept helping one another across team borders. Top-down implementation failed to take informal team structures into account.

[83] On the other hand, it is clear that there are senior managers who welcome and initiate changes that give workers more autonomy and more influence over the labor process at large. CEO Ekhart of tin can factory TDV noted: "You come to work in a company as a manager and you see that people have to keep their mouth shut. People are being thought for, instead of that they think for themselves. People do not only have hands, they have minds as well. If you say this, you must follow it up with action. It means that you must share a little power and splendor. It also means that as a manager you are not the only big shot in the company, but that the entire company consists of big shots." (quoted in: R. Huiskamp (ed) 1993: 12) In Chapter Two, we have seen several other examples of firms where senior managers welcomed anti-Tayloristic change: Volvo, Sigma Coatings, Rietbergwerke, Staco, Opel Hoppmann.

[84] In the Halmstad County Hospital, there was no evidence of head nurses feeling threatened. They were no longer involved in direct patient care. But the changes in the organization of work brought education and inspiration as new tasks. Furthermore, due to decentralization of financial responsibility, they had taken up budgeting.

[85] Oral communication by IHC's Mr. P. Wemmers

[86] J. Bloem, plant manager of Sigma Coatings in Amsterdam, is vigilant about attempts by middle management to acquire more power "You have to disapprove of it strongly when someone wants to play the boss over something and wants to create a special department for something."

[87] Not only managers risk losing ground, workers in staff departments run the same risk. At TDV (tin can manufacturing), people from quality control tried to prevent that production workers would take over their work. A solution was to transfer quality people to the sales department. The plant manager of Sigma Coatings in Amsterdam says: "Most of the problems we have are with the outside world [i.e. the corporation] like staff departments that claim to have a supporting role, but who want you to work in their way. For example, one department tries to keep track of absence through illness, something that we do for ourselves. They fear becoming redundant. If I were in the same position, I would do the same thing. [..] In a recession, that is a good place to prune. We ask someone who calls himself 'company controller': 'what is your contribution?'. If we consider that unsatisfactory we do not use his services."

In the LOM project on team nursing in the clinic for internal medicine in St. Göran Hospital in Stockholm, doctors resisted the changes. (Naschold 1992b, Anhang C, 147)

[88] In-depth interviews with managers might be useful.

[89] In his professional work, he was simulating production, military and transport organizations. To facilitate this, he co-invented the computer language SIMULA, the first object oriented language. (More than two decades later, object orientation was to become the hot new paradigm in programming.) However, Nygaard felt that his technical work did not fit in well with his political convictions.

[90] Sandberg (1992: 75) wrote: "SAF's policy was to secure the existing power structure in the companies and in society at large, while allowing for changes in the day-to-day job situation on the individual."

[91] Examples from Sweden and from Germany follow further down in the main text. In the UK, the TUC (Trades Union Congress) aimed in the beginning of the 1980's to regulate the introduction of new technology through "New Technology Agreements". The check-list that these agreements were supposed to comply with included an anti-Tayloristic item: "Control over work: union influence over systems design and programming; no computer-gathered information to be used in work performance measurement"(Gill 1985: 123-124).

A Dutch example: in 1985, the FNV transportation union tried to achieve a technology agreement in the port of Rotterdam. The plan was that the agreement should include provisions dealing with the quality of working life, against redundancies and against the use of information systems for the registration of the performance of individual workers. (Computable 26 Sept. 1986)

[92] Stichting voor Technologie en Zeggenschap (Foundation for Technology and Control).

[93] K. van Uitert (1990) describes a support program that ran from 1985 till 1989, subsidized by the Ministry of Social Affairs and Employment and the Ministry of Economic Affairs. This allowed the union to hire one researcher/consultant.

[94] Sandberg et al. (1992: 50) wrote: "If collective co-determination agreements have been reached on [..] hiring, firing, organizing production the labor side enjoys [..] priority of interpretation until the dispute has been settled. (The normal progression moves from local negotiations to central negotiations and, finally, for questions that could set a precedent, to the Labor Court.)"

[95] Statement made by S. Agurén during symposium "The Swedish model, suitable for import?" in Groningen November 1988. See Buitendam, Dumas and Glebbeek 1990.

[96] The UK is not among the countries where one finds "legal interventions directed to "securing greater worker participation in enterprise decision-making." (Cressey 1992: 250).

[97] Kallevig's working paper does not give any details about the survey, like sample size. The following results are relevant:

"Does the union make use of their lawful rights to obtain information and participation in the designing processes of data-systems? " 11% in large degree, 50% in small degree, 36% not at all (p. 24); "How often is implementation of new technology and its consequences being discussed in the union?" 17% never, 76% sometimes, 7% often (p. 25); "Is implementation and use of new technology in your workplace covered by local agreement between management and local union?" 15% yes, 78% no, 8% uncertain (p. 27).

[98] W. Buitelaar used this metaphor in a presentation.

[99] The Arbetslivscentrum investigated union participation in strategic decisions in Swedish industry. 521 companies were selected which, during a period of two years, had underwent strategic changes (reorganization, computerization, personnel reductions, introduction of new production lines or new technology, merger, a move to a new location). In ten per cent of the companies, managers indicated that the local unions were involved in the starting phase. In 68 per cent of the cases, managers indicated that unions were involved in the decision-making process. In 42 per cent of the companies, managers said that the local unions were involved in the implementation phase. Interviews with union representatives resulted in higher scores for these questions, respectively 24, 94 en 59 per cent.

Another researcher claimed that, following the "Development Agreement" emphasis shifted towards the level of the individual worker and the autonomous team. As a result of this, co-determination grew almost synonymous with increasing productivity and product quality. (This would imply that the participation aspect became less important. H.P.) Source: "Whatever happened to Swedish co-determination?", in European Industrial Relations Review, Oct. 1989: 12-13. The two original research reports, to which this review article refers, are: Levinson, K., Fackliga aktörer i strategisk förändring inom koncerner - mederkan och inflytande, Stockholm, Arbetslivscentrum, and H. Hart en S.H. Hörte, Medbestämmandets Stagnation - Medbestämmandets utveckling 1978-85, Göteborg 1989, Arbetsvetenskpliga Kollegiet.

[100] This account is based on Schauer et al. (1984)

[101] This search involved the following sources:

1) reports based on research that was designed to bring successful cases to light, followed by inquiries about promising cases. Carrying the fierce title "The Control of Frontiers. Workers and New Technology; Disclosure and Use of Company Information" in 1984 a comparative study appeared based on 20 case studies from Sweden, the FRG, The Netherlands, Italy and the U.K. These cases were selected according to the criterion of best practice", i.e., "major influence of the worker representatives on the technical and social changes and, at least, stronger than average trade union organization and better than average access to company information (Levie and Moore 1984a, 2)". In two cases, the researchers reported worker influence on the organization of work. Both cases were located in Sweden. In the design process of a new dairy, factory worker influence caused more space for manual intervention to be created than in some heavily automated dairy factories. (Levie and Moore 1984b, 44). With respect to the Swedish Postgiro, it is reported that the unions succeeded in changing the direction of the automation process, from (labor) cost reduction to improvement of services and job security (Levie and Moore 1984b, 34). In the early 1990's, I made inquiries about these two promising cases.

In The Netherlands, researchers from the Research Institute for Technology and Democracy (STZ) produced ten case studies of "influence projects", in which: "unions and/or works council have autonomously formulated demands, directed at technology and related changes in the organization [..]; they made systematic, often protracted attempts to realize these 'social demands [..]; there was some measure of success: by improving (certain aspects of) the quality of working life, by a greater influence on the decision-making in company or institution and/or by strengthening the union work."

Additionally, an internal research report from the Dienstenbond FNV (union for the service sector) proved to be useful.

2) Searching the scientific literature for cues (see bibliography).

3) Inquiries at the Swedish Center for Working Life, Arbetstagarkonsult AB in Stockholm and STZ in Amsterdam (consulting firms that are specialized in working for unions), the University of Arhus, and IG Metall in Frankfurt.

4)Participation in (inter)national conferences, including the STZ anniversary symposium and five Labor Process Conferences in the UK.

[102] Information from video documentary "Computers in Context" by California Newsreel.

[103] The system was scheduled for introduction in the summer of 1995.

[104] Oral communication by L. Sundström.

[105] Marcuse (1942: 419) wrote: "Individualistic rationality has developed into efficient compliance with the pre-given continuum of means and ends. The latter absorbs the liberating efforts of thought, and the various functions of reason converge upon the unconditional maintenance of the apparatus."

"Rationality is being transformed from a critical force into one of adjustment and compliance. Autonomy of reason loses its meaning in the same measure as the thoughts, feelings and actions of men are shaped by the technical requirements of the apparatus which they have created. Reason has found its resting place in the system of standardized control, production and consumption. There it reigns through the laws and mechanisms which insure the efficiency, expediency and coherence of the system." (Marcuse 1943: 422)

[106] "The system of life created by modern industry is one of the highest expediency, convenience and efficiency" (Marcuse 1943: 421)

[107] A movement away from Taylorism is not the only factor that can explain a reduction of absence through illness. In the Halmstad County Hospital, there is more attention for the problem. When somebody reports ill, the head nurse calls.

By 1990, Volvo Uddevalla had not solved the absence through illness problems. In the spring of 1990, the plant suffered an absentee rate of twelve percent.

[108] Kelly (1982) reported a mean job reduction of 25 per cent.

[109] The metalworkers' union wanted to see a different system introduced, with the production standard applied as an average, so that sick leaves may lead to a temporary decline in a team's production pace, to be compensated for later when the entire team is present. For the moment, the spokesman could ask for help from another team in case of sick leaves. In spite of that, there were complaints about a too high work pressure and the associated social pressure.

[110] An example is the Unichema (Unilever) chemical factory in Gouda. (Pot and others 1993, Brouwers 1989)

[111] Sandberg 1993. The spokeswoman said that ninety per cent of the cars that Uddevalla produced were made for specific customers.

[112] J. van Berkel, "Technologie-overeenkomst als informatieplatform" in: Computable 31 Oct. 1986: 26

[113] This was part of the design principles for the terminal as reproduced in Bosselaar 1986 and in Van Delden and Stam 1986. Beedenbender (1990) indicated that productivity in maritime transportation can be most improved in the area of yard operations.

[114] Since 1991, Sweden has legislation that corresponds with Section 12 (Gustavsen 1992: 26).

[115] Personal memorandum by J. J. Ramondt

[116] Mueller et al. (1986: 138) investigated the various viewpoints of those involved with production automation inside a company and concluded: "Information gathered from a variety of sources has shown very clearly that not only are there major differences between management, unions and shopfloor operators in their beliefs about new technology, but a diversity exists within each group. This means that subgroups within management and on the shopfloor can have views different from other members

of their group but similar to subgroups in a different group. In the most notable example, few attitudinal differences exist between (a) managers who believe in operator control over technology, (b) unions who advocate operator control, (c) operators who have had experience on AMT. At variance with this consensus, and for different reasons, are managers who believe in specialist control and manual-unskilled operators who believe that the new technology means lower quality and efficiency, more boredom, less autonomy and more job losses. The evidence dispels the notion that the belief systems of management, unions and workers each represent a unitary, homogeneous position."

[117] Zimbalist (1975: 58) wrote: "[..] work humanization either is confined to cosmetic modifications in the organization of work or it has the potential to lead to fundamental changes which challenge capitalist control, over the production process. [..] Work humanization, insofar as it is significant at all, is an unstable proposition. It must go either forward or backward."

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SAMENVATTING

Trends als Lean Production en McDonaldization duiden erop dat het Taylorisme een hardnekkig verschijnsel is. Bovendien blijkt dat informatietechnologie vaak zodanig wordt gebruikt, dat daarmee Tayloristische patronen worden versterkt. Er bestaat echter een tegenbeweging.

Er is veel geschreven over verschillende vormen van anti-Tayloristisch beleid. De daaruit voortvloeiende veranderingen op het niveau van de werkvloer zijn tot dusver nauwelijks systematisch geanalyseerd. Voorts bestaat er veel verwarring over wat nu de drijvende krachten achter dit beleid zijn. In dit boek wordt een poging ondernomen deze kloof te dichten door 150 cases te analyseren van anti-Tayloristische initiatieven. Deze cases hebben betrekking op organisaties in Duitsland, Nederland, Scandinavië en Engeland.

De hoofdstroom bestaat uit consensus-gerichte initiatieven van management en werknemers (vakbond of OR) om alternatieve organisatievormen te creëren. In deze initiatieven vinden we een drie-eenheid van processen:
1) (Her)ontwerp van structuren.
2) Top-down strategieën om werknemers in de nieuwe structuren in te passen.
3) Spontane, sociale bewegings-achtige processen.
Consensus-gerichte alternatieven zijn ondersteund door onderzoekers, die terwijl ze onderzoek en advieswerk combineren, expertise verzamelen over het veranderen van de organisatie van het werk, en die weer aan organisaties beschikbaar stellen. Ze leverden produktieve bijdragen aan verandering. Mislukkingen waren er echter ook.

Er zijn drie verschillende benaderingen te onderscheiden: participatief ontwerpen, integraal sociotechnisch systeemontwerp en humanisering van de arbeid. In de praktijk leiden deze benaderingen tot gelijkwaardige resultaten. In Scandinavië en Duitsland bestaan door de overheid gefinancierde onderzoeks- en ontwikkelingsprogramma's, die mogelijke alternatieven voor het Taylorisme verkennen en tot doel hebben, managers voor te lichten over alternatieven. (Ook was de Europese Unie actief op dit terrein.)

De diffusie van succesvolle alternatieven is een zwak punt. Van oorsprong was de basismethode hiervoor om succesvolle cases als model in de schijnwerpers te plaatsen. Meer en meer wordt deze methode vervangen door een netwerkbenadering van diffusie.

De onderzoeks- en ontwikkelingsprogramma's omvatten projecten met het doel technologieën te ontwikkelen die niet Taylorisme-bevorderend zijn en die verandering in organisaties kunnen ondersteunen. Het bleek mogelijk om dit soort technologie te ontwikkelen, maar het bleek problematisch om ze succesvol op de markt te brengen.

Consensus-gerichte alternatieven vertonen duidelijke successen op de terreinen: vermindering van technische disciplinering (bijvoorbeeld het ontkoppelen van werknemers van het tempo van de lopende band), taakverbreding, taakverrijking, decentralisatie van verantwoordelijkheid en participatie.

Heronderzoek van klassieke cases bracht aan het licht dat er echter vaak regressie naar meer Tayloristische vormen optreedt.

In het boek worden twee typen beperkingen verkend: het vasthouden door managers aan hun macht, als een doel op zich, en de relatieve efficiëntie van Tayloristische oplossingen. Beide beknotten de mogelijkheden voor verandering. Onafhankelijke vakbondsactie zou een mogelijkheid kunnen zijn om het vasthouden aan de macht door managers te compenseren. Vakbonds-initiatieven (en OR-initiatieven) lopen echter tegen specifieke barrières aan. Deze hebben te maken met toegang tot informatie en tot besluitvormingsprocessen, timing, problemen die inherent zijn aan het onderhandelen over kwalitatieve zaken en het probleem dat vakbonden hebben om het initiatief te nemen. En zelfs als deze vakbonds-specifieke obstakels gepasseerd zijn, liggen er nog de algemene obstakels die betrekking hebben op alle anti-Tayloristische initiatieven.

De Scandinavische landen en Nederland kennen wetgeving gericht tegen een degraderend ontwerp van arbeidsplaatsen. Dit kan worden gezien als pogen de grens te doorbreken, die efficiëntie-vereisten aan het humaniseringsstreven stellen. Het bleek evenwel, dat het voldoen aan de standaarden niet echt werd opgelegd.

Het dominante perspectief met betrekking tot anti-Taylorisme is modernisering, dit wil zeggen dat het gezien wordt als een manier om organisaties beter aan te passen aan hun in toenemende mate veranderende omgeving. Zelfs een aantal van diegenen, die kritisch schrijven over het herontwerpen van arbeidsplaatsen, past in dit paradigma.

Modernisering is in veel opzichten een adequaat perspectief. Echter, een aantal aspecten van het anti-Taylorisme, zoals de morele dimensie, het veelvuldig voorkomen van regressie, het element van werknemers-bescherming in overheids- en vakbondsbeleid, is strijdig met de moderniseringsvisie. Dit leidt tot de conclusie dat anti-Taylorisme niet alleen een aanpassing is van de organisatie aan steeds snellere veranderingen in de omgeving, maar dat het ook een gevolg is van een noodzaak om nieuwe manieren te vinden om te leven met de blijvende, alles doortrekkende eigenschappen van de loonarbeidsverhouding.

Curriculum vitae

Study: Sociology, University of Amsterdam
Work:
- 1985 Freelance researcher (City of Amsterdam)
- 1985-1986 Scientific Programmer at SWIDOC (Royal Dutch Academy of Sciences)
- 1986-1988 Instructor at the Department of Methodology of the Faculty of Social Sciences of the Erasmus University
- 1988-1992 Instructor at the Department of Sociology, Erasmus University
- 1992- Assistant Professor, Department of Sociology, Erasmus University

Hans Pruijt is married and father of two.