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Process Orientation, Integration of Work Teams and Management Control

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Abstract

There is a trend in Swedish companies to use team-based organisational design when striving for process orientation. The first question put forth in this paper is whether this design supports a process orientation. Since the teams usually are rather autonomous it is not obvious that they become integrated with other teams in the process. The second question put forth is if and how management control, in a broad sense, can support an integration of the teams. In an explorative field survey, aiming for an overview of the topic, eight industrial plants have been studied. Four of the cases are presented in this paper.

Observations and conclusions are presented as follows; Firstly, the teams can become objects of suboptimization, but they can also support integration by creating empowerment with the employees. Secondly, there seem to be two basic modes of process orientation, one more mechanically and one more mentally focused. Not surprisingly, a mental mode seems to better support an integration of the teams. Thirdly, the control system used in one of the cases is compared with Ouchi’s clan concept. Fourthly, the control mechanisms do seem to be of importance, either supporting or preventing a mental process orientation. One important aspect is if the different control mechanisms are integrated themselves, or if they are sending contradictory signals. Another aspect is the object of the performance measures.

Finally, to continue the research, use of an action research method is proposed in order to study the implementation process.

BACKGROUND

The background to this article is the current trend towards process orientation in Swedish organisations, especially in the manufacturing industry. Process orientation is often strove for in order to increase customer focus in an organisation. By cutting lead times, improving quality and increasing customisation, the ambition is to increase customer satisfaction. Another rational for process orientation is a wish to reduce costs and capital employed. In order to reach these goals so called non-value-added activities are abolished and stocks and inventories are reduced.

The process orientation trend can be explained from several perspectives. One is the contingency perspective (e. g. Lawrence & Lorsch 1967). Increased global competition, demand for fast deliveries and customised products as well as rapidly changing market preferences are forcing companies to become more process oriented in order to survive. A change in the contingencies must be followed by a change in the organisation in order to maintain a fit. But the trend can also be explained from an institutional perspective. Isomorphic pulls (DiMaggio & Powell 1983) from successful companies make other companies follow. Japanese companies like Toyota, but also companies in Sweden like ABB, do seem to play an important role creating these pulls. Related to these pulls is management fashion (Abrahamson 1996). Process orientation has definitely become a management fashion in Sweden in the nineties, and more or less every company that wants to be regarded as fashionable have to at least appear process oriented to some extent. Both contingent and institutional factors might to some extent explain the current development towards process orientation.

Often a technique, like Just-In-Time, Total Quality Management or Business Process Reengineering is being used in order to become more process oriented. These techniques might include changes to the production layout, working routines and the organisational structure. Sometimes the methods are referred to as philosophies rather than techniques and they also include an ambition to change behaviour and attitudes in the organisation. The team concept (e. g. Katzenbach & Smith 1994) could be regarded as such a philosophy. When used in a manufacturing context the workforce is grouped in teams, usually based on processes or product lines. In Swedish organisations, especially in the manufacturing industry, process orientation and team-based organisations seems to be very related. They are usually referred to as target-oriented teams, workflow teams or sometimes autonomous teams. One possible explanation to the popularity of the teams is that Sweden has a tradition of experimenting with autonomous teams long before TQM and Lean Production became popular (Sandberg 1982). Another explanation is that ABB has created an isomorphic pull. Target-oriented teams are a central component in Swedish ABB’s T50-project. T50, which has attracted enormous attention in Swedish industry, is a customer focus project with the explicit target to reduce lead-times with 50 percent.

CONCEPTS

Process orientation

Although there seem to be some coherence among practitioners and consultants about the usefulness of process orientation, there seem to be less coherence about what it actually is. The word process is defined from a lot of different perspectives. From an engineering perspective a process is often equivalent to the working routines, a view that to some degree is influenced by the scientific management tradition. A metaphor used is that of a canal or a river (e.g. Rentshog 1998). The canal makes it possible to transport boats just as the process makes it possible to fulfil orders etc. Thus the process is a standardised flow used repetitively for a recurring task. Process orientation then deals with designing and improving the standardised flow. Standardisation of the flow is also motivated with the measurability this facilitates and measurability is another usual criteria for a process (Davenport 1993). From an information support perspective a process is also often defined as something that has an input, transforms the input and has an output (Hammer & Champy 1993, Davenport 1993). A process can be anything from the smallest activity to the core process. This view seems to be influenced by the process mapping often carried out in this field. A third perspective is that of Activity Based Management, where a process is a series of activities linked to perform a specific goal (Turney 1991). Each activity is an internal supplier and/or customer in what Turney calls a customer chain (ibid.).

These perspectives are not necessarily mutually exclusive. They have a lot in common and one thing they have in common is that they all regard the process dimension as a different, even opposite dimension to the functional dimensions. They stress the importance of going beyond the functional division of labour and focusing on all activities creating the output. The negative consequences of a strong focus on the functional dimension are used as rationales for process orientation in all fields. However, following the definitions above it is not necessarily obvious that the process represents the opposite dimension to functions. Considering the engineering perspective, designing working routines can be regarded as a functional task and it is even one of the foundations for division of labour. Furthermore, standardising the working routines might very well decrease the flexibility that the process orientation is said to increase. Likewise from an information support perspective, functions do just like processes transform input to output. And conceiving even the smallest activity as a process might even lead one to believe, despite the intention, that process orientation means focusing on the parts and not on the whole. The activity-based definition is less problematic from this point of view, but few processes are probably possible to describe as a clear-cut activity chain.

Still, separating the two dimensions when working with process orientation might be very important. The reason for this is not necessarily philosophical, but indeed very practical. There is sometimes a tendency for organisations to be more focused on the functional dimension than the process dimension even when working with process orientation, with limited results as an effect (Nilsson 1997). This can be the case when dividing the natural processes into subprocesses, similar to functions, and working with each process individually and/or being very focused on the working routines. I can see two possible explanations for this phenomenon. The first explanation deals with the cognitive maps of the members in the organisation and the change project. The functional mindset (Majchrzak & Wang 1996) seems to be very deeply rooted and changing it is not easy. Therefore it might be easier both to sell in and implement the concept if it relates to the existing cognitive maps. An approach that resembles Scientific management might do just that.

The second explanation deals with the power distribution in the organisations. In order to work with processes several functional departments and areas of responsibility need to be involved. Only working within one area of responsibility at the time, dividing the subprocesses between the line managers, is one way to avoid conflicts. The risk with this approach is that that the major integration problems are not addressed and that nothing really changes. But it is a way to avoid conflicts and thus preserve the truce in the organisation (Nelson & Winter 1982).

One way to see the process dimension as the opposite of the functional dimensions is to relate these concepts to the two basic organisational needs according to Lawrence and Lorsch (1967). Functions relate to the need for differentiation and process orientation to the need for integration. The role of the function is to uphold and develop competence and the process orientation hopefully contributes to a better integration of different competencies. Processes also relate to the product dimension as described by Galbraith (1973). The development and the delivery fulfilment of a product can be regarded as processes. But, as Galbraith points out, integration is needed both in the product and the functional dimension. The functional integration is needed for the development of competence and the integration in the product dimension is important to create good products and directly satisfy the customers.

In order to develop the definitions above we can therefor argue that a process is a group of activities, performed repetitively or not, which together directly contributes to a purpose related to an external or internal customer. From this perspective functions can be seen as groups of often similar activities with the purpose of performing a certain task and upholding competence to perform this task. A process usually, but not necessarily, involves more than one task. Process orientation then becomes the way we integrate the tasks and activities involved in the process. Working with the process without addressing the integration issue would not be considered as process orientation according to this view. In a traditional hierarchic organisation tasks and functions have been co-ordinated by management rather than integrated. With process orientation the employee, and not only the manager, becomes more focused on the process and the internal or external customer, and relatively less focused on the task.

Teams

Some aspects that distinguish teams from traditional work groups is that they often are multiskilled, flexible and to some degree autonomous. Being multiskilled means that the teams perform more direct as well as indirect tasks than a functionally designed group and therefore often incorporate a larger part of the process. Normally the team members are also capable of performing several tasks within and sometimes also outside the team. This multiskillness means that they can increase their efforts wherever it is needed at the moment, thus increasing flexibility and decreasing lead times. The flexibility also increases by the fact that the teams are autonomous and can make most decisions themselves without having to consult managers. Another rational for the autonomy is an ambition to create empowered and motivated team members.

RESEARCH TOPIC

Process orientation and autonomous teams

The team concept is often considered to be an important part of techniques and philosophies striving for process orientation and it is regarded as one of the basic principles behind lean production (Krafcik 1988, Womack et. al. 1991). The fact that the teams are multiskilled and flexible supports an ambition to become process oriented and lean (Karlsson & Åhlström 1996). Whether the fact that the teams are more or less autonomous also supports a process orientation is not so obvious. It probably supports a process orientation within the teams, but does it support a process orientation involving several teams? There might at least be a risk that the autonomous teams choose not to concern themselves with the needs of the other teams, resulting in the teams becoming objects of suboptimization. This problem does not seem to be discussed much in the literature, although Schonberger (1986 p. 116) slightly touches upon it. Although claiming that autonomy creates job enrichment, he also states that it does not favour interaction with other teams. However, he does not present any evidence supporting this opinion.

If the total process includes only one team this is not a problem, but often this is not possible or appropriate. One reason why it could be less appropriate is that it would require the teams to be very large and that might endanger the empowerment goal. If the process is divided into several teams, the teams usually have a sequential interdependence (Thompson 1967).

In order to avoid the risk of suboptimization the teams need to be co-ordinated or integrated. In a traditional functional organisation the teams would probably be co-ordinated by a manager in the hierarchy. But if they are autonomous there is perhaps no one with the formal authority to co-ordinate them. Traditional roles as supervisors might be abolished in favour of more supportive ones, since co-ordination from the hierarchy would not be in line with a process orientation. A hierarchy in its traditional sense is therefore not very likely to exist or to be very important. So, what remains is an integration of the teams involved in the same process.

Integration and control mechanisms

It is possible that an effective integration of the teams arises more or less spontaneously. It is also possible that it is an effect of a deployed strategy involving the use of one or more control mechanisms. Existing control mechanisms might also be of importance, either supporting or preventing integration, even if it arises more or less spontaneously. The main focus of this study will be on these mechanisms. Does control mechanisms matter for the integration of the teams? Which are they and how are they used? How do the mechanisms interact and what effect do they have on the integration? The control mechanisms might be of very disparate types. Some of the integration mechanisms discussed in the literature are presented in the theory section.

Purpose

Two questions are put forth above. The first deals with how process orientation and a team-based organisation relate to each other and if teams become integrated in the process dimension. The second question deals with the part that control mechanisms might play in creating, supporting or preventing this integration. The purpose with the research presented here is to give an overview over the topic. The overview is likely to give some indications to if this is a problem and how it is handled in organisations. It is not very likely to give any definitive answers to why the problem is or is not handled in a certain way. However, this study will also be a preparation for a deeper action oriented study, addressing questions as why things are handled in a certain way and how ways of handling things evolve.

METHOD

The method used in this study is a field survey. Between one and three shorter visits have been made at eight plants. The plants were chosen on the criteria that they tried to increase the focus on the process dimension and had a team based organisation. This means that the plants studied are not representative of a Swedish industrial plant. On the contrary, most of them belong to the most progressive ones in the studied region. At these visits I have typically met and interviewed three to five persons, in some cases more. Typically these persons included the controller of the plant, the person driving the organisational changes, usually being the workshop manager, and someone directly involved in the integration or co-ordination of the teams. The latter person could be a supervisor, a production planner or a member of a team.

The interviews were conducted in a less than structured way. The ambition was to let the interviewee give his or her view of the topic and to a large extent preside the discussion. The role of the interviewer was mainly to pick up loose ends and steer the discussion in interesting directions. Still, the interviewer had to see to that no vital aspects of the problem were overlooked during the discussion. Overlooked aspects were usually brought up in the end of the interview. Almost all interviews were taped and later analysed and interpreted at several occasions in order to create fair and consistent descriptions of the cases.

The main advantage with the chosen method is that it may give a broader understanding than a single case study. Although no statistically significant conclusions can be drawn, some kind of pattern will hopefully emerge from the studies. The main disadvantage probably is the lack of depth in the studies, especially concerning the development leading up to the current situation. The possibility to validate the statements made in the interviews is also limited. Trying to reduce this problem critical questions have been put to more than one person, and attention has been focused on inconsistencies in the statements. Still, this method is probably more appropriate in an explorative study than in a testing of hypotheses.

THEORY

Integrating mechanisms in organisational theory

Thompson (1967) sees three levels of interdependencies in organisations. The first and weakest interdependence is pooled, the second sequential and the third and strongest is reciprocal. All units in an organisation have a pooled interdependence since the performance of any unit can jeopardise the whole organisation. Some units also have a sequential interdependence if for instance one is an internal supplier to another. If the units are supplying each other, then their interdependence is not only sequential but also even reciprocal. According to Thompson (ibid.) pooled interdependence is the easiest to co-ordinate while reciprocal is the most difficult. Standardisation is therefore an appropriate type of co-ordination for pooled interdependence, planning for sequential interdependence and mutual adjustment for reciprocal interdependence. The different types of co-ordination require an increasing extent of decision making and communication.

Mintzberg (1979) who places co-ordinating mechanisms in a complexity continuum makes a similar classification. In the low end of the complexity continuum mutual adjustment is used, simple problems are dealt with by using informal communication. As complexity increases direct supervision will be required. A further increase in complexity and standardisation of work process, output or skills is appropriate. Finally, at the high end of the complexity continuum mutual adjustment will be required again since none of the other mechanisms will be able to handle the complexity.

Lawrence & Lorsch (1967) find that differentiation and integration are contradictory to each other. Despite this fact they show that successful companies, although being more or less differentiated, still are highly integrated. This is possible since the highly differentiated companies develop a high skill in solving conflicts, the conflicts being a result of the differentiation. One contributing factor to developing this skill is to create competent integrating functions. Another factor is to make sure that the influence over a decision is concentrated where the relevant information is available. A third factor is to create an open climate where all problems are confronted and not being smoothed over.

Galbraith (1973) sees the need for integration mainly as a management problem with management time as the scarce resource. In order to free management from this co-ordination task there are four ways to handle the integration. The first alternative will arise spontaneously if management is not co-ordinating the operations properly and no other alternative is being used. This alternative is the use of slacks. The second alternative is to incorporate all required functions into one unit, a self-contained task. An example can be found at a plant of Sandvik Coromant (Lind 1996), where basically all functions necessary for producing a certain tool were integrated in one workflow team. The third method is to invest in vertical information systems in order to increase the information processing capacity. The final method resembles Lawrence and Lorch's integrating functions. Galbraith calls it lateral relations. These relations can vary from informal communication to a formal organisational dimension in a matrix organisation.

Eliminating slacks is also one of the most important issues in lean production (Womack et. al. 1991, Karlsson & Åhlström 1996). The ambition is not to have any buffers of personnel, lead-time or inventory. The latter is achieved by only producing on orders and only ordering material when it is needed, pull instead of push. The lack of buffers makes this system rather vulnerable to disturbances. In order to reduce disturbances issues of product quality and on time delivery becomes very important. The philosophy is not to correct errors but to eliminate their causes, which might include the worker stopping the production line when a quality problem occurs. This is very much in line with Lawrence and Lorch's notion that the decision should be taken where the relevant information is available. This is also achieved by incorporating indirect functions into multifunctional teams, thereby bringing them closer to the process. The ambition to eliminate problems, or rather the causes to the problems, is an example of a cross functional approach and is likely to improve the integration, since the causes often can be found further up in the process.

In a manufacturing setting the integration is clearly influenced by the production layout. Schonberger (1986) divides this layout into six types. The first and least integrated is *clustered, jumbled*. As the name suggests this is a layout with functional clusters. The clusters are not organised by the workflow as opposed to the second type, *clustered, flow-line*. Type three to five, *cellular, unitary* and *dedicated flow line*, are all more integrated. In a cellular layout the required tasks for a product family are grouped into a cell. Unitary is a form of a cellular layout where several tasks are incorporated into one single machine or assembly station. Dedicated flow line means that the line only produces one single product. The last type *combined* involves several types and might be used when moving from clustered to flow line.

In a process oriented organisation one would not expect to find slacks or vertical information systems as solutions to the integration problem. One would rather expect to find workflow teams, cellular, unitary or dedicated flow line, with as many functions as possible integrated into the teams. If there were more than one team in the process one would expect to find lateral relations or integrators. The influence over the decisions would be concentrated to the team level and not to the managers in the hierarchy and the problems would be confronted to the people working where the problem was created. However, Thompson's idea that these mainly sequential interdependencies would be dealt with by using planning does not seem to be in line with lean production and just-in-time philosophies. They seem to be more in line with Mintzberg's continuum where standardisation or mutual adjustment is suggested under more complex circumstances.

Performance Measures

Performance measures can be used to strengthen integration in at least two ways, through the objects of the measures and through the types of measures. One way is to measure objects in the process dimension. According to a study of three major industrial companies attention is focused on the dimension being measured (Ewing 1992). Another study of two industrial companies concluded that performance measures of the product dimension can have positive effects for the integration, even if the manager responsible for them does not have formal authority over all departments involved (Johansson 1994). At the operational level it is recommended to raise the level of unit of analysis from operation to the whole process or at least to the team level (Lind 1996, Åhlström & Karlsson 1996).

Another way to strengthen the integration is to choose measures likely to support it. An interesting concept is that of lagging and leading indicators (Kaplan & Norton 1997). Lagging indicators does only tell the performance of a historic period. Leading indicators do also give a hint of future capabilities and possibilities. The lagging measures are often, but not necessarily, financial and the leading measures are often operational. Models promoting operational measures as well as measures of customer satisfaction are the Performance Pyramid (Lynch & Cross 1991) and the Balanced Scorecard (Kaplan & Norton 1992). However, these models have been criticised for being top-down or centralistic (Mouritsen et al. 1996). If so they are probably less suitable for a process oriented organisation. Some Scandinavian researchers claim that local performance measures and control systems should be chosen and designed locally (Jönsson & Grönlund 1988, Jönsson 1996). However, the Balanced Scorecard can also be used in this more decentralistic mode (Hoffecker & Goldenberg 1994) and is perhaps also especially appropriate for multifunctional teams (Meyer 1994). One example of this use is the balanced scorecard in some ABB companies, EVITA[*] (Ewing & Lundahl 1996). EVITA is used as a performance measurement system for target oriented teams. It consists of five dimensions of which at least two are likely to support a better integration, namely the process and customer perspectives. Although top management decides the company vision and the

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[*] EVITA is short for *Ekonomi- och Verksamhetsstyrning I T50-Andan* which could be translated as Management and operational control in the T50 spirit, T50 being a customer focusing and lead time reduction project.

dimensions, these are developed into critical success factors, critical actions and critical measures by the teams themselves.

Reward system

How the reward system can be used to support integration seems to be less covered in the literature than the use of performance measures. However, Karlsson and Åhlström (1995) made some observations when they participated in a project implementing lean production in a manufacturing company. They argue that a piece-rate system is less appropriate in a lean production environment, since it promotes producing as many units as possible and also might reduce the motivation for continuous improvement. Instead they promote a system in congruence with the principles of the organisation. In this case that means a system that is based on the founding principles, as well as the most important outcome variables of lean production. In manufacturing they suggest a fixed part based on competence and team skills in terms of leadership and flexibility, in order to support the founding principles. A bonus part based on quality, on-time delivery, productivity and levels of work in process is promoted to support the desired outcome variables.

Culture

According to an Australian survey (Abernethy & Lillis 1995) performance measures are relatively less important in what they call flexible production. More important control mechanisms are integrating mechanisms of an organisational character, but also developing the culture in a way that encourages the employees to identify themselves with the goals and visions of the company. Out of a study of twenty successful companies Bartlett and Ghoshal (1995) concludes that a heavy reliance on formal control systems would preferably be reduced and supplemented with a focus on encouraging self-monitoring and developing personal communications. The most basic characteristic found in the companies was organisational transparency, including the employees knowing and understanding the corporate objectives.

Ouchi (1979) calls a control strategy not far from this *clan control*. The ambition in clan control is to create common goals for all members of an organisation. This is achieved through a socialisation process and the recruiting of the personnel becomes very important. The need for performance measures becomes weaker in a clan organisation. Frequent use of rules and measures might even decrease the motivation of the members when using clan control according to Ouchi. In line with the findings of Abernethy and Lillis he claims that contingencies like unique tasks, as in customisation, or integration, as in process orientation, make other control strategies less appropriate and leaves the clan strategy as the only alternative (Ouchi 1980).

Ouchi's clan concept has been criticised by Alvesson and Lindkvist (1993). One of the limitations they see is that economic rationality (Ouchi 1980) is not likely to be the only driver for clans to arise. Apart from economic clans based on economic rationality, they expect social clans and blood relationship clans to exist based on socio-emotional and biological factors respectively. They also argue that clans are more likely to appear in older and more stable organisations with long traditions and strong cultures. Contingencies like unique tasks and integration, on the other hand, are more likely to appear in young, rapidly changing organisations. So, according to Alvesson and Lindkvist clan control is more likely to appear in organisations where it is less appropriate. In organisations where it is appropriate, on the other hand, it is very difficult to create.

Interaction of the mechanisms

In an attempt to create a more comprehensive contingency framework for management accounting, Otley (1980) describes an organisational control package. The package consists of four components: the accounting information system, other management information systems, organisational design and other control arrangements. Otley argues that there is a strong interdependence between the components and that it is impossible to separate the effects of the different control mechanisms. Therefore they must be evaluated as a whole. This implies that the performance measurement system or any other control mechanism should not be studied in isolation. In order to study the effect on the integration of teams it would even be impossible to reduce the study to one mechanism. All of the most important mechanisms, as well as their interdependencies need to be studied. It also implies that different mechanisms can complement each other. Unlike Ouchi this view does not necessarily see performance measures and cultural aspects as alternatives. Organisational structure, performance measures, cultural aspects etc. might be used in an integrated mode that strengthens the total effect.

THE FIELD SURVEY

Allgon Mobile

The first company in the sample manufactures products for transmission of radio signals. The customers are mainly companies in the telecommunication business, but also retailers who sell directly to the final customer. Allgon Mobile manufactures aerials for mounting on vehicles. The production plant is fairly small, concentrating on assembling and relying on suppliers around the world for the components. The plant is located outside Stockholm and the workforce is quite young.

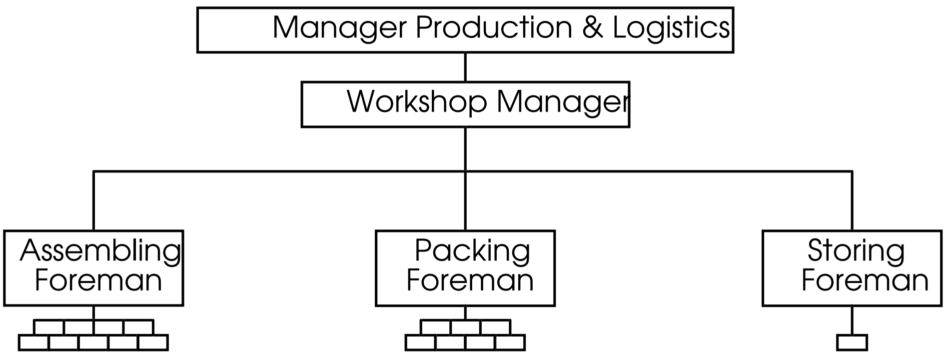

Figure 1: Organisation chart of Allgon Mobile's workshop.

The production department consists of 65 persons. As the Figure shows, the organisation is functionally designed, and that also applies to the work groups at the bottom of the hierarchy. Using Schonberger's (1986) classification the structure can be described as clustered jumbled. The jumble is emphasised by the fact that the groups are scattered on different floors. There is a group leader in every group and a foreman for every sub-department. There are also staffs like planning, supply, quality and production engineering outside the workshop. However, there is one group designed as a workflow team, with most of the functions integrated into the team. This team, which consists of 16 people, handles its own planning, ordering and packing. It only manufactures one product for one customer and can be categorised as a dedicated flow line (ibid.). According to a production engineer this is possible because of the high and steady volume produced of this particular product:

"If you have a product with large volumes you can build a line that stays put. You nail it to the floor. Then you get a real product group line. Then it's possible to plan a bit better."

Otherwise the product range is very large and the volumes ordered of each product small, making them less suitable for dedicated flow lines. The production engineer continues:

"We have many products, so if you're going to have this line on the tables, laying there all the time, then we should need a building that's three to four times as big."

This is a consequence of the fact that different products require different tools. Given the present size of the workshop changing products also require a change of the tools. In order to reduce the time used for changing tools the production is accomplished in large batches. Therefore, the production planning is based on forecasts and most work groups produce for stocks and not on orders. It would be possible to have order production as well as work flow teams if using more flexible tools reduced the set-up times, according to the production engineer. However, the investments necessary for making this possible is not considered justifiable. In order to solve this problem the production manager is trying to influence the development department to design the products in a way that increases the similarity between products, thereby decreasing set-up time and making the products more suitable to manufacturing in work flow teams.

Even if it would be an exaggeration to say that most of this plant is process focused, they have ambitions in this direction. The company used to experience problems with low quality, long lead-times and high stock levels. By defining the tasks better and giving greater responsibility to the workers this has improved a lot, according to the production manager. As a step in this process the company has been quality certificated. According to the manager this has had a positive effect although stating that:

"*It is important that the operations controls the documentation and not the other way around."*

Apart from a greater responsibility being given to the teams, whether functionally designed or not, a lot of time also has been spent on education in many different areas. However, these efforts do not seem to relate much to creating neither customer focus nor a better integration.

The needs for integration in the workshop are handled in very different ways. In the only work flow team the problem is taken care of by integrating most of the required functions into the team, which becomes self-contained (Galbraith 1973). The rest of the teams are functionally designed and the need for integration with other groups and staffs is greater. In spite of this there seems to be a very weak integration of the teams. It is probably fair to say that the teams are co-ordinated rather than integrated. Since most material in process does not go from one team to the next, but from a team to the storing and from the storing to the next team, the integration problem is to a great extent also handled by slacks (ibid.) in the form of buffers.

The formal communication between the work groups consists of meetings between group leaders and planners. The group leaders only meet once a month but the planning meetings are more frequent. The first person in the hierarchy responsible for the whole production process is the workshop manager. A person responsible for deliveries also has a co-ordinating role, making sure that every team fulfils its parts necessary for making the deliveries in time. The amount of informal communication between the groups is low. The group leaders and other members are unwilling to make contact directly with another work group. One reason for this is probably the fact that the groups are scattered on different floors and do not really socialise and the members of different groups do not know each other very well.

Studying the control mechanisms it would probably be fair to conclude that no stronger signals towards a process orientation have been sent. The performance measures being directly confronted to the work groups are mainly traditional cost measures. The exception is the quality measures putting attention to quality problems, caused by the group, appearing later in the process. The wages are mainly being based on work task and do probably have a conserving effect, if any, on the functional thinking. The training carried through has also to a large degree focused on functional skills rather than on process thinking. So, the signal being sent by control mechanisms is if not strong at least fairly consistent and it supports a functional focus rather than integration and customer focusing.

The focus on quality involves a fairly large amount of measuring, lead times from suppliers and inventory levels being some of the most important. Due to problems with the integrated information system most measuring are either carried out, adjusted or presented manually. The majority of the measures are not directly confronted to the workers. However, the ambition is to present some of the measures on boards in the workshop. If there are a lot of measures of the whole process, the performance measures of the work groups are fewer and mostly lagging (Kaplan & Norton 1997). They consist of measures of scrap, bad quality as well as costs for labour and material.

The conclusion from this case is that process orientation involving customer focus and integration are neither reached nor aimed at to any larger extent. Although my ambition was to choose organisations, which were progressive from the studied perspective, this one seems to be normal rather than progressive. The categorisation of this plant as “normal” is done out of personal experience rather than any scientific criteria. However, members of more progressive parts of Allgon, that I have encountered when performing later studies, have confirmed this interpretation. As a normal or typical case it might be of interest and some observations can be made. One observation is that almost every change effort carried out involves formal matters such as working routines, logistics and responsibility and seldom behaviour or attitudes. Another observation is that a great deal of the measurement is made for the managers and not for the employees. The general impression is that of a rather traditional, functional organisation using modern, but rather bureaucratic, methods to improve its operations.

TA Control

TA Control manufactures control systems for regulating indoor climate. The head office, marketing and R&D departments are located in Malmö in the south of Sweden. The fairly small production plant where the hardware is manufactured is for historical reasons situated outside Stockholm. The workforce is rather heterogeneous as regards age, cultural and educational backgrounds.

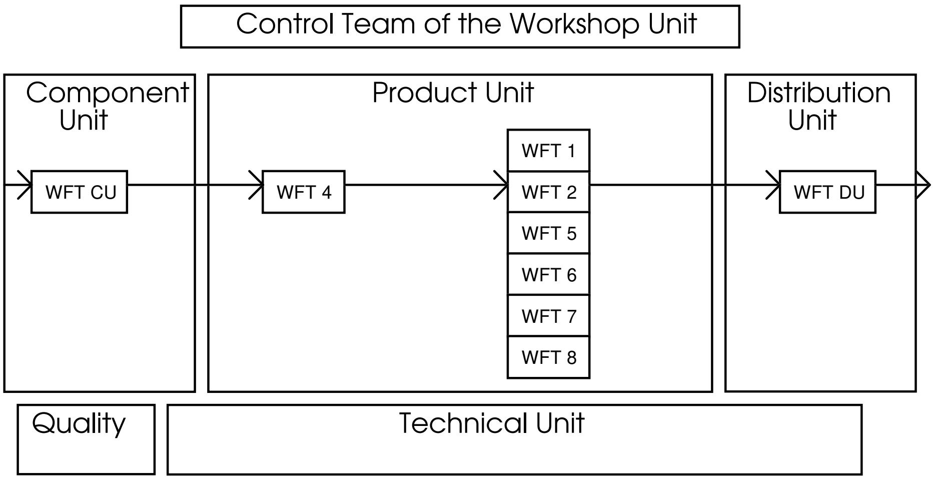

Figure 2: Organisation chart of TA Control's workshop

In 1990 the plant experienced problems with long lead-times, high inventory levels, low quality and a high rate of turnover of the employees. The solution to the problems was a reorganisation of the functionally designed plant to a design based on workflow teams. The result was a design partly functional and partly process oriented. The workshop is divided into three main functional units: the Component Unit, the Product Unit and the Distribution Unit. There are nine work flow teams and seven of them belong to the product unit. Six of the teams are cellular (Schonberger 1986), being based on different product types and the remaining three, based on functional tasks, can be regarded as clustered, flow line (ibid.). A controller, a role rotating among the members of the teams, controls the teams. Every main unit also has a control group, supporting the teams when necessary but usually trusting the group to handle its own problems.

The ordering process of a certain product involves four teams, namely the component team, team four which is an internal supplier to the product teams, one of the product teams and the distribution team. The ambition is to incorporate the function of the component team in the product teams. Although increasing, the proportion of the production being based on orders is still not larger than ten percent. The reason for this is a doubt that they can manage to deliver within three days, which is a customer demand, without buffers of certain items. This is at least partly a consequence of the older products not being designed in a way that permits production within three days.

The attitudes of the workers towards the changes that have been taking place are described as cautious, and they have adjusted to the changes rather than driven them. At first the employees were very unwilling to communicate with members of the other teams when the workflow teams were newly created. They were more likely to try to handle problems in the hierarchy. This was particularly so if it meant communicating over traditional barriers, like the one between blue and white collars.

"It's been much easier making the team function well as a team, having control over and talking to each other and all that, than crossing the borders."

This has improved a lot though, partly as a result of a stable workforce where people have got to know each other better. Still, the workers are identifying themselves with their teams rather than with the workshop or the company. The teams are even to some degree competitive, and want to perform better than the other teams. Low concern for the goals of other teams and even conflicting goals might very well contribute to less communication taking place between the teams. One conflict does for instance exist between team four, an internal supplier to the product teams, which wants to manufacture in large batches and the product teams who would like to have a more flexible supplier.

The signals from the control mechanisms are rather mixed in this respect. The performance measures focus very much on the performance of each team and very little on the total process. The teams are being assessed on the basis of their isolated performance. Some of the focused measures are productivity and quality measures. On-time delivery is also a focused topic, but the system to measure it is less than perfect. Some of the measures like on-time delivery and quality can be regarded as leading (Kaplan & Norton 1997) and might very well support a process orientation. Because of the bonus system the more lagging (ibid.) productivity measure seems to be the most focused though.

The major part of the wages is fixed, but a part of it is based on individual competence. Versatility and multiskillness are being rewarded. The bonus component is based on the performance of the team. It is based on the productivity measure, but the ambition is to also take measures of on-time delivery and quality in consideration. The reason why the on-time delivery measure is not included today, is that the teams are not responsible for this since a failure is often caused by lack of material, or as a manager puts it:

"But if you don't have control over the material you can always say that we didn't have material and that's the reason why we couldn't deliver in time. But when they get [control over] *the material they will become masters of the whole process, ...then you can make demands on ability to deliver."*

The ambition is to incorporate the supply function from the component team, which will be abolished, into the product teams. When this has been carried through the product teams can be responsible for the deliveries.

The control groups are trying to compensate the focus on the teams by convincing them to focus more on the whole process and not just on the performance of their team. A member of a control group even sees himself as a preacher:

"[I am] *preaching as a vicar sometimes probably, this is the way it should work and so on."*

Incorporating as many functions as possible into the teams, making them self contained (Galbraith 1973) mainly creates the integration in TA Control. The teams are also to a certain degree integrated by lateral, informal communication (ibid.). The rather low share of order production also creates some slack in the process (ibid.), which decreases the need for integration. But the interest to integrate the teams might probably have been greater if the performance measurement and bonus systems had been designed in a different way.

What we seem to have here is an example of contradictory control mechanisms. The policies and “preaching” are pointing in one direction and the bonus system in another. The result seems to be a much stronger focus on the team’s performance than the performance of the whole process. This might be explained by the fact that it is easier to focus on the team than on the process, the integration of the teams was a greater problem than the teams themselves from the start. It does perhaps also imply that the bonus is a very strong control mechanism. The reason given for this design is quite practical, the teams can not be held responsible for something they can not control. This view can of course be questioned; the performance of a team is dependent on their input in most situations. Whether this is the true reason for the existing design or not is very hard to tell from this kind of study.

ABB Control

ABB Control is part of the ABB Group, producing various types of circuit breakers and similar products. The company is organised in product areas and we are going to study the workshop of one of those areas. This workshop employs about 50 people organised in four target-oriented teams and the dominating task is assembling. The workforce seems to be more stable and homogeneous than in the previous cases.

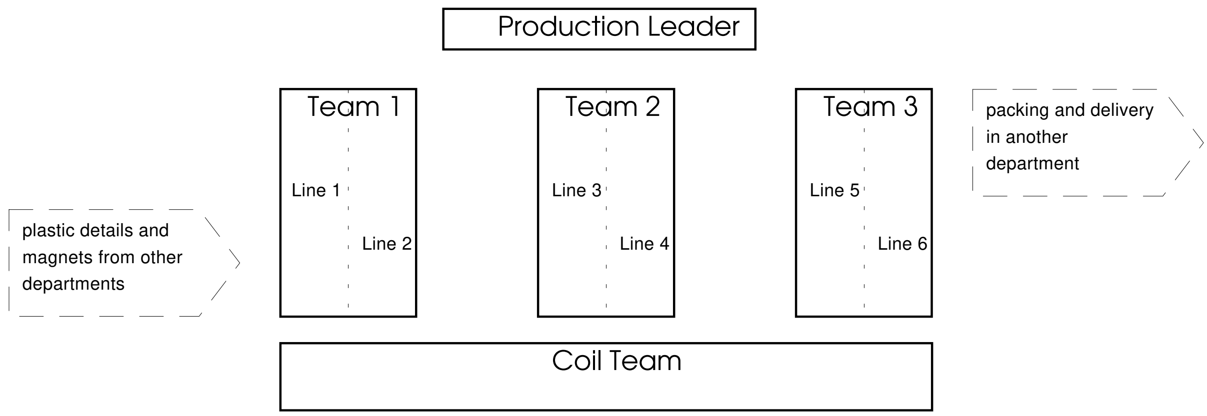

Figure 3: Organisation chart of one workshop in ABB Control

There are six product lines in the workshop, grouped in three target-oriented teams. These teams can be regarded as cellular (Schonberger 1986). The fourth team is a supplier of coils to the product lines. Apart from the coils the product lines are also supplied with plastic parts and magnets from within the company, although from other departments. The workshop delivers its products to another department which do the packing, and not directly to the customers.

The teams consist of ten to fifteen members and they include basically all functions they need to perform their tasks. All production is order based and the teams get the orders directly from the customers, which are sales companies within ABB. The team decides whether an order can be accepted and they have a total responsibility, as a team, for making the deliveries they have committed themselves to. There are no leaders in the teams but there are specialists for planning, quality issues, budgeting etc.

Since the workforce is very stable and know each other well, the informal communication works well both between teams and with managers. A manager says:

"Sometimes people talk so much that you'd be surprised... Some people have been working in other departments and have been moving around. And they know this one and that one and are even related to this one and that one."

The teams seem to be well integrated, at least inside the studied workshop. However, despite the informal communication the teams are not so integrated with internal suppliers and customers outside the workshop, as they are inside. There are no serious problems as far as the suppliers are concerned, internal or external. Still, some quality problems have occurred with the magnets and the internal supplier does keep buffers in order to make fast deliveries to the workshop. Also, the fact that the packing is done in another department does delay the deliveries with more or less one day. The ambition is to shorten the delivery time to one day. In order to reach this target the plan is to incorporate the packing into the teams.

When the change process started at ABB Control, it coincided with a large number of dismissals. Since this contributed to a shared feeling of crisis it was easier to begin the change process. The employees eventually got used to frequent changes and now even have positive attitudes to them. A person in the Human Resource department says:

"Today I think that people have an enormous will to try new things, because it's built in into the target oriented teams that one will have new responsibilities and that one will rotate people."

Since the changes usually involve some kind of process orientation, the employees are rather focused on the process and the customers. The controlling mechanisms also contribute to this. The information and communication aim at creating a common vision in the organisation. The reward system favours co-operation and the bonus is based on the performance of the whole company. The performance measurement probably contributes in two ways. The first way is by including the process and the customer perspectives in EVITA. The other way is perhaps by having a common EVITA for the whole workshop.

The amount of formal training accomplished is very limited at the moment. Instead, a great deal of job rotation is being performed. The importance of information to and communication with the employees are being stressed. Managers not having the social ability required are sooner or later given other assignments. By communication, explaining decisions etc., management is trying to create a common vision among all employees. Important components of this vision are high quality and satisfied customers.

The wages are individual and based on work task, competence and an estimation of flexibility and co-operative ability. There is also a smaller bonus based on the performance of the whole company, regarding on-time delivery among other things.

The performance measurement system is a balanced scorecard called EVITA (Ewing & Lundahl 1996), with three perspectives so far. The perspectives are the financial perspective, the process perspective and the customer perspective. The workshop is measured as one single unit in the balanced scorecard. Normally when the balanced scorecard is used in ABB Control, every team has its own scorecard with its own targets and measures. One reason for this not being so in the workshop is that the managers found it difficult to involve the workers in the process of designing a balanced scorecard. The required number of people involved to design one scorecard would accordingly be smaller than the number required designing four. One can of course speculate about what consequences this might have. Perhaps the team members will be less enthusiastic about their targets and measures, resulting in a lower commitment than if every team had there owned scorecard. On the other hand, it might possibly contribute to less competition and better integration of the teams.

The conclusion seems to be that the integration is very well developed between the teams in the workshop, but perhaps not quite so well between departments. The explanation for this is probably that the changes to a large extent have been driven locally, in this case by a dedicated person in the workshop. This person has to large extent contributed to the creation of a common vision in the workshop. But changing other workshops and departments is probably harder since this and other persons in the workshop have less influence over these.

Atlas Copco Tools

Atlas Copco Tools manufacture hand tools mainly for the assembling industry, car assembling among others. The head office with marketing and research departments is situated in Stockholm, but the production plant we are going to study is located in the small village of Tierp. Unlike the previous cases Atlas Copco produces a lot of their components themselves. The workforce is very stable and homogeneous as regards age and cultural background. The employees are quite young and often rather well educated.

The plant is organised in a rather functional way. It is organised in five departments of which production and assembling are the ones directly involved in the workflow. All work in assembling is order based, but there is an inventory of components. Each department consists of several teams and workflow leaders, which support the teams. In assembling the teams are based on different types of products, making them cellular (Schonberger 1986). In production, which is the larger of the two departments, they are based on specific functions in the form of particular types of machines. All the machines in one team are basically of the same, flexible type. With this strategy any product can be produced in any machine in the team. This increases flexibility and removes bottlenecks. The result of this strategy is a functional design of the production department, which can be described as clustered, flow line (ibid.). The managers in the plant state very clearly that, in order to be flexible, they do not want the workshop to consist of more than one workflow:

"If we have decided to have one type of lathes, then they are going to look exactly the same. And then you have one large work flow through the workshop."

The fact that the production department is designed as one large process, rather than as separate processes for different products, means that the single process becomes longer and more complex. Even as this would call for a high level of co-ordination in the hierarchy, the teams experience a rather high degree of autonomy and the role of the workflow leaders is mainly supportive. Clearly, this design does create a great need for integration of the teams. According to one manager the solution to this need for integration is to consistently focus on the total process and the customer:

"[The solution is] *constantly stating that it is the total work flow that is important, so it is not suboptimizations in the work flow but it is the total flow. It is really what we can do in the assembling towards the customer* [that matters]."

Accordingly, the message communicated by management is very clear:

"Every step and every decision that will be taken shall be for [the good of] *the total work flow."*

This strategy seems to be rather successful with a good integration and well developed informal communication in the workshop, as well as between management and workers. One example of the informal communication is that people from the production department often, sometimes several times every day, visit the assembly teams and discuss their current need of components. The very stable, homogeneous and still young workforce facilitates this. It is also supported by the control system.

The performance measures are one example of this focus on the total workflow. Large screens have been put up in the workshop showing planned and fulfilled deliveries, productive hours according to standards and incoming orders. The first figure is a measure of delivery safety and the second a productivity measure, both for the total plant. The third measure is perhaps not a typical performance measure, since the plant does not directly influence it. Still, it is very important with an order-based production planning which Assembly Tools uses. Besides, it also stresses the importance of the customers. More important than the type of measures is perhaps the object of the measures, which is the total plant. Other measures such as budget and quality measures do exist on lower levels, but the measures on the screens are the most focused ones.

The wages are based on competence and the supervisor's opinion of individual performance. Formerly, there was also a bonus system in use, based on the total performance of the plant. According to a manager this was abolished since people had problems relating their individual performance to the total performance, one individual's contribution to the total being quite small:

"They see the link but the question is if they feel that they can influence it. And if you don't feel that you can influence it directly, then I think you focus more on the money than on the cause. "

However, this argument could also be valid as regards the performance measures on the screens. If the employees can not feel that they can influence their bonus based on the performance of the plant, how can they feel that they can influence the performance measures?

Probably more crucial than the performance measures is the loyalty among the workforce to the company. This loyalty is for different reasons quite strong in the plant. One reason could be the very special mentality of the area where the plant is situated. Traditionally this area is a rural industrial area*, where people for centuries have had a strong feeling of identification with the company they were employed by. A manager thinks that:

"[It is important] *that we are situated where we are. It is a tradition to have a positive attitude towards the company."*

But the geography is probably not the only explanation, since the culture in the plant has evolved over time. In the seventies the mentality in the plant was more like that of a typical traditional factory. The most significant change came in the eighties when the survival of the plant was seriously threatened. Of total nine plants in the company only one has survived and the Tierp plant was not the most likely candidate. The reason why this plant was chosen was that it was very successful in implementing a new production strategy. So, it is likely that the changes from the beginning to a

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* The Swedish word for this is *bruksbygd* and it refers to areas where Walloon smiths settled down in the 17th and 18th century and began the industrialisation of Sweden. The societies in these areas often became very tight, with high degree of social control and practically all aspects of life controlled by the factory owner long into this century.

large extent were driven by fear of being closed down. Eventually, when they had successfully implemented a more customer focused production strategy and also managed to survive their confidence grew. Today, I would say that they to a large extent are driven by positive factors like challenge. Still, the success of the plant continues to be absolutely vital for the survival of the village. Other important factors to uphold the culture are recruitment and human management. An example of the latter is that the CEO comes up from Stockholm every year before Christmas, to personally deliver a Christmas gift and thank every employee.

Another factor that may have played a very significant role in the change process was the manager of the plant who initiated the change process soon after his arrival. I am not sure how to interpret his role since no one mentioned him as very significant the first time I visited the plant. When returning after a year or two everybody was referring to him as a major factor in the change process. What had happened between these visits was that he had passed away. He had also become a hero in the myths of the plant. At the more recent visits he was described as the person who initiated the changes and got everybody else involved and enthusiastic. He was described not only as the person who saw the change of the production strategy through, but also the person who altered the culture in the plant. Maybe his role was being overstated but I think that he played a very significant role. One reason why he was not mentioned on my first visit might be that the interviewees did not want to give him to much credit when still alive and working in the plant. This might be the case because not only was he described as a dedicated and enthusiastic, but also as a very strong, almost authoritarian leader.

The perhaps most interesting observation from this plant is that although the formal structure is rather functional the informal structure and culture seems to be process oriented and integrated. The strong culture and the shared understanding that it is the performance of the whole plant that matters has a great resemblance with clan control (Ouchi 1979).

ANALYSIS AND CONCLUSIONS

Process Orientation and Autonomous Teams

One of the basic questions addressed in this study is how autonomous teams and process orientation relates to each other. The answer, not surprisingly, seems to be that it depends. The fact that an organisation is team based does not necessarily mean that it is process oriented. Allgon Mobile uses the team approach to some extent both for their workflow team as well as for their functionally designed production. Generally, it seems like the team design is more a way to create empowerment of the workers, than a way to create a focus on the process. This does not necessarily mean that teams become new objects for suboptimization, but tendencies of this do occur, particularly in the TA Control case. The identification with the teams is quite strong in this company and the culture is to some extent competitive. This is probably partially the result of the performance measures and the bonus system focusing on the productivity of the teams.

But if the TA Control case show that the teams can become objects of suboptimization, the ABB Control and Atlas Copco Tools cases imply that they can become rather integrated. These cases where the integration seems to be best developed, are also the cases where the process orientation seems to have a mental dimension. The mental dimension might very well be very important for the integration. Without it the employees are not very likely to bother with the consequences of their performance, whether inside or outside of their own team. If the team-based organisation is used to create empowered employees, the team design might, if it is successful, contribute to the mental process orientation and therefore also to the integration of the teams. The reason for this might be that the empowerment hopefully created by the team approach, also facilitates an understanding of and focusing on the total process. In that case does a successful team organisation support a process orientation. This finding is in line with the literature (Krafcik 1988, Womack et al. 1991, Karlsson & Åhlström 1996) arguing that the use of teams is an important part of the lean production concept.

Two basic modes of process orientation

The fact that only two of the cases seem to have an apparent mental dimension implies that there are two basic modes of process orientation, as applied in organisations. The two modes could be called mechanical and mental. The mechanical mode appears to be a consequence of seeing organisations as machines (Morgan 1986). The most obvious example in this sample is Allgon Mobile, where focused aspects include production layout, well-defined work tasks and responsibility. An important component in the change efforts is the quality work carried out in order to get a quality certification. If my interpretation that this case is normal rather than progressive is correct, the mechanical mode might be the normal way to execute a process orientation. The mechanical mode does seem to have a lot in common with the engineering definition of process orientation and appears to be very influenced by the Scientific management tradition.

Even if the mechanical mode, in its pure form, well might have positive effects in organisations, it can be seen as an expression of the phenomena discussed in the beginning of this paper. Although it is called process orientation it seems to have more in common with traditional approaches and it arguable supports the functional dimension as much or more than the process dimension. It is customer focused only if the process satisfying the needs of the customer can be standardised and it deals with integration issues only if these issues can be standardised.

The mental mode of process orientation would be more focused on the people working in the process. Important aspects would be that the people are focused on the needs of the customer and concerned about how their effort fit in with other people's effort in the process. Atlas Copco Tools is the most obvious example of this approach among the cases presented here. With this approach informal communication becomes more and standardisation less important. This approach is more likely to support flexibility, at least flexibility concerning unforeseen events. Following Mintzberg's continuum a mechanical mode might therefore be more suitable in relatively more stable operations and a mental mode more appropriate under very complex circumstances, i. e. circumstances where process orientation generally is considered suitable.

The two modes are not necessarily mutually exclusive. If Allgon Mobile uses a mainly mechanical mode and Atlas Copco Tools a mainly mental mode the other two are using a bit of both, although TA Control is mostly mechanical and ABB Control more mental. But some aspects are totally different in the two modes. The most important aspect is probably the control strategy. In an entirely mechanical mode the control would be rule-based (bureaucratic) and in an entirely mental mode the control would be value-based (cultural), and these two control strategies do not mix very well.

If the employees are used to following rules in their work it will probably be difficult for them to change their behaviour when needed, probably even to understand when it is needed. It the employees are used to make their own decisions out of their perception of the need of the customer, on the other hand, it is probably difficult to for them to adjust to rules or standards. An example of this is that the quality certification carried through in Atlas Copco Tools is not very appreciated. It is seen as an extremely bureaucratic exercise with little or none contribution to the operations of the plant.

Clan control

The two companies that follow a more mental mode of process orientation, Atlas Copco Tools and ABB Control, seem to benefit from homogeneous work forces and community feelings in a way that resemble the clan concept (Ouchi 1979). Loyalty with the company and a feeling of working together towards a common goal seems to be very important factors in both companies. Especially in the Atlas Copco case a value-based control system seems to be working effectively. Rule-based control and performance measurement do seem to be playing minor roles. This does support Ouchi's notion (ibid.) that performance measures are less important when using the clan strategy. In ABB Control, on the other hand, the policy creating activities and measurement systems seem to be working hand in hand.

It is very interesting to compare the Atlas Copco Tools case with the arguments made by Alvesson and Lindkvist (1993), who argue that a clan is difficult to create in a modern and flexible environment. This modern plant that have a young workforce used to changes, is being built in the seventies and is therefore quite young. At the same time it might benefit from the culture and traditions of the area taking shape during the last three hundred years. This way the plant might very well have found a way, although not intentionally, to get past this dilemma. A reasonable young plant in an area with strong traditions is of course not enough for a clan to arise, but it might offer very good conditions for it.

The case does also support the criticism of Alvesson and Lindkvist (ibid.) of Ouchi's notion that a clan exists for purely rational economic reasons (Ouchi, 1980). However, this does not mean that this clan is easily categorised into one of Alvesson and Lindkvist's (1993) clan types. It is partly an economic clan in the respect that the plant is crucial for the economic survival of the village, a fact that is likely to contribute to the community feeling. It is also partly a social clan since the workforce seems to enjoy working together towards a common goal. It is probably also a blood kin clan to some degree in the respect that a lot of people are likely to be related not only to current colleagues, but also to future generations of employees. So, what we seem to have is a clan that have arisen and continue to exist for a number of reasons, even if some reasons might be more important than others might.

Control mechanisms

Performance measures

Performance measurement is used quite differently in the cases. But the differences are not very significant regarding type of measures used. All companies are using both lagging and leading indicators of more or less similar types. In this respect they are following the recommendations of Kaplan & Norton (1997), even if the number of measures vary. The strategy to create empowerment by letting the teams and their member's design their own measures is not fully utilised in any of the cases.

The difference between the cases is probably greatest concerning the objects of the measures. In one company the team members are not much confronted with performance measures at all. In the others they are measured on the team, workshop and plant level respectively. It would probably be fair to say that the integration in all cases is stronger within the measured object and not quite so strong with teams or departments outside this object. In Atlas Copco Tools where the plant is the measured object, it is unlikely that one individual can see his or her contribution to the outcome. The measures are perhaps having more of a symbolic use in this case, sending the message that it is the performance of the total plant that matters. Only measuring on a rather high level also seems to be combined with the use of more cultural control mechanisms. Perhaps a bit surprisingly, combining measures of the teams with measures of the total process is not being done in any of the cases. Either teams or larger units are being measured.

Reward systems

The only company in which the bonus system seems to be important is TA Control and in this case it does not support integration, since it is linked to the productivity of the teams and nothing else. ABB Control does also have a bonus system, but linked to the performance of the whole company. Atlas Copco Tools used to have something similar but abolished it since the workers were not considered able to link their own performance to the bonus. Used in this way, linked to the performance of the company or plant, the function of the bonus system is probably more symbolic than directly motivating. More important than the bonus system in supporting the integration are probably the wages. This support is more indirect than direct since multiskillness, flexibility and co-operative ability often are rewarded beside factors like competence and work task. The relatively greater importance of the wages than the bonuses suggests that the reward systems be used for controlling behaviour and attitudes rather than output.

Integration of the control mechanisms

As important or perhaps even more important than the design of any single control mechanism seems the integration or interaction of the mechanisms be. TA Control is one example where the mechanisms are not used in interaction. The messages of process thinking and co-operation being sent by management are even counteractive to the signals sent by the performance measures and reward system. The use of the mechanisms seems to be more interactive in ABB Control and Atlas Copco Tools, where all mechanisms seem to be designed in line with process orientation and integration.

However, it is not obvious that an interactive design must be superior to a counteractive design. It could be argued that the control mechanisms are complimenting each other when pointing at different goals. It could be a way to secure that both goals are focused to a certain degree. In the TA Control case, however, this does not seem to be a very successful way. The productivity goal seems to be much more focused than the effectiveness goal. Moreover, there is the risk that contradictory messages create confusion and frustration among the employees. From this perspective it is probably better to handle contradictory goals within one mechanism, making the need for trade-offs evident. One way to do this is perhaps by measuring in several perspectives, explicitly stating that they are different perspectives and to some extent even include contradictory goals. If so, these problems are probably easier to handle with a balanced scorecard such as EVITA in ABB Control.

Connecting to the discussion of different modes of process orientation and control, this is perhaps not only a question of integration of different control mechanisms but also of integration of different control strategies. In the TA Control case the contradiction is between a target-based bonus system and value-based “preaching” and other policy creating activities. However, ABB Control does seem to be able to handle a target-based control system in the form of a balanced scorecard and integrate this with the use of value-based approaches. The difference is of course that the control strategies give contradictory signals in the former but not in the latter case. An example of successful integration of rule-based and value-based control strategies has not been found though.

CONTINUED RESEARCH

The study reported in this article is of an explorative nature, more aiming at getting an overview of the problem than drawing any safe conclusions. Another aim is to rise issues that seem to be of importance and therefore point out interesting directions for the continued research. I think it has been quite successful in this respect. Every aspect discussed above might well be worth to follow up. But when continuing the research a more focused approach would be useful. Therefore, I haven chosen one, or perhaps two, aspects that I intend to focus on and it is the integration of the control strategies and mechanisms.

Judging from the cases in this study integration seems to be important, perhaps even more important than the design of the individual control mechanisms. It also seems that an integrated or interactive design is more effective than a counteractive design. These conclusions are probably neither surprising nor controversial. Still, less integrated and even counteractive designs exist and are perhaps even common. A possible explanation to this is that a functional division of labour not only counteracts integration in the business processes but also in supporting processes like management control. The design and use of the different control mechanisms might be managed in isolation from each other, perhaps even by different functional departments. Apart from the production department, departments for accounting, quality, logistics and human resource might all be involved. And even if the same persons were involved in the design of all mechanisms, they might not consider the integration of the mechanisms.

There is also a possibility that the choice of control strategies and design of control mechanisms are governed by other factors than an ambition to create the most effective control system. Such factors might include reactions to isomorphic pulls (DiMaggio & Powell 1983) and a wish to be fashionable (Abrahamson 1996).

There might also be more conservative factors such as the established routines being difficult to change for various reasons (Scapens 1994). According to this view the design and evolution of control systems is a continuos adaptation to social culture. The habits and routines forming this culture might be chosen because they have proven to be effective in the past. Since they probably are implemented at different points in time, creating sediments in the organisational routines (Danielsson 1975), they are probably reactions to different problems and therefore not very likely to be integrated. They might then remain because they represent equilibrium in the organisation and not changing the routines might be a way to avoid conflict and preserve the truce in the organisation (Nelson & Winter 1982, Scapens 1994).

Another possibility is that the design is at least partly governed by factors without any rational explanation of any kind. The design can be an interplay of rationality and foolishness (March 1981) and the outcome might very well be a surprise. The foolishness is the result of conditions like slack, symbolism and loose coupling (ibid.). The last condition is very interesting since it implies that intention and behaviour, or behaviour in different parts of an organisation or at different points in time are not necessarily in line with each other. In that case it is not very surprising that organisations conduct process orientation in a way that is very close to Scientific management and not very focused on integration issues or the customer. Nor is it very surprising that different control strategies and mechanisms are not integrated with each other.

Trying to examine these alternatives or looking for other explanations for the development of the control mechanisms, it might be a good idea to participate in the process of designing and implementing a control system for a process oriented organisation. A deeper study is probably necessary in order to understand the complex processes leading up to a control system design. An involvement in the process is probably also preferable since only doing interviews might give rationalised explanations. An action research approach might therefore be appropriate.

REFERENCES

Abernethy, M. A. and Lillis, A. M. (1995) The Impact of Manufacturing Flexibility on Management Control System Design. *Accounting, Organizations and Society* 20, 241-258

Abrahamson, E. (1996) Management Fashion. *Academy of Management Review*, Vol. 21, No. 1

Alvesson, M. and Lindkvist, L. (1993) Transaction Costs, Clans and Corporate Culture. *Journal of Management Studies* 30, 427-452

Bartlett, C. A. and Ghoshal, S. (1995) Changing the Role of Top Management: Beyond Systems to People. *Harvard Business Review*, May-June 1995

Brunsson, N. and Olsen, J. P. (1993) *The Reforming Organization*. Routledge, London

Danielsson, A. (1975) *Företagsekonomi – En översikt*. Studentlitteratur, Lund

Davenport, T. H. (1993) *Process Innovation, Reengineering Work through Information Technology*. Harvard Business School Press, Boston, MA

DiMaggio, P. & W. Powell (1983) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, Vol. 48, April

Ewing, P. (1992) *Ekonomisk styrning av enheter med inbördes verksamhetssamband*. (with summary in English), EFI, Stockholm

Ewing, P. and Lundahl, L. (1996) *The Balanced Scorecard at ABB Sweden - the pilot projects*. Paper presented at the annual EAA conference in Bergen

Galbraith, J. R. (1973) *Designing Complex Organizations*. Addison-Wesley, Reading, MA

Hammer, M. and Champy, J. (1993) *Reengineering the Corporation, A Manifesto for Business Revolution.* Harper Collins Publishers, New York, NY

Hoffecker, J. and Goldenberg, C. (1994) Using the Balanced Scorecard to Develop Company wide Performance Measures. *Cost Management*, Fall 1994

Johnson, H. T. (1992) *Relevance Regained, From Top-Down Control to Bottom-Up Empowerment.* The Free Press, New York

Johansson, C. (1994) *Ekonomistyrning i flödesorienterade organisationer.* Stockholm School of Economics

Jönsson, S. (1996) *Accounting for Improvement.* Pergamon, Oxford

Jönsson, S. and Grönlund, A. (1988) Life with a Sub-contractor: New Technology and Management Accounting. *Accounting, Organizations and Society* 13, 512-532

Kaplan, R. S. and Norton, D. P. (1992) The Balanced Scorecard - Measures That Drive Performance. *Harvard Business Review*, Jan-Feb 1992

Kaplan, R. S. and Norton, D. P. (1997) Why Does Business Need a Balanced Scorecard? *Journal of Cost Management*, May-June 1997

Karlsson, C. and Åhlström, P. (1995) Change processes towards lean production: the role of the remuneration system. *International Journal of Operations & Production Management* 15 (11), 80-99

Karlsson, C. and Åhlström, P. (1996) Assessing changes towards lean production. *International Journal of Operations & Production Management* 16 (2), 24-41

Katzenbach, J. R. and Smith, D. K. (1994) *The Wisdom of Teams, Creating the High-Performance Organization.* HarperBusiness, New York

Krafcik, J. F. (1988) Triumph of the Lean Production System. *Sloan Management Review*, Fall 1988

Lawrence, P. R. and Lorsch, J. W. (1967) *Organization and Environment, Managing Differentiation and Integration.* Harvard Business School Press, Boston

Lind, J. (1996) *Ekonomistyrning och verksamhet i utveckling, Ekonomiska rapporters utformning och användning när verksamheten flödesorienteras.* (with summary in English), University of Uppsala

Lind, J-I and Skärvad, P-H (1997) *Nya Team i organisationernas värld.* Liber Ekonomi, Malmö

Lynch, R. L. and Cross, K. F. (1991) *Measure Up! Yardsticks for Continuous Improvement.* Basil Blackwell, Cambridge, MA

Majchrzak, A. and Wang, Q. (1996) Breaking the Functional Mind-Set in Process Organizations. *Harvard Business Review*, Sept-Oct 1996

March, J. (1981) Footnotes to Organizational Change. *Administrative Science Quarterly*, 26: 563-577

Meyer, C. (1994) How the Right Measures Help Teams Excel. *Harvard Business Review*, May-June 1994

Mintzberg, H. (1979) *The Structuring of Organizations.* Prentice-Hall, Englewood Cliffs, NJ

Morgan, G. (1986) *Images of Organization*. Sage Publications, London

Mouritsen, J., Høholdt, J. and Jørgensen, A. (1996) De "nye" og de "gamle" ikke-finansielle nøgletal. *Økonomistyrning & Informatik* 11, 387-409

Nilsson, G. (1997) *Observationer i samband med en flödesorientering, Process Management i Ericsson Telecom.* EFI Research Paper No. 6572, Stockholm

Otley, D. T. (1980) The Contingency Theory of Management Accounting: Achievement and Prognosis. *Accounting, Organizations and Society* 5, 413-428

Ouchi, W. G. (1979) A Conceptual Framework for the Design of Organizational Control Mechanisms. *Management Science* 25, 833-848

Ouchi, W. G. (1980) Markets, Bureaucracies and Clans. *Administrative Science Quarterly* 25, 129-141

Rentzhog, O. (1998) *Processorientering, En grund för morgondagens organisationer*. Studentlitteratur, Lund

Samuelson, L. A. (1993) Effekter av nya styrsystem för sjukvården. In *Redovisningens Roller*, eds. L. A. Samuelson and L. Östman. EFI, Stockholm

Sandberg, T. (1982) *Work organization and autonomous groups*. Liber, Lund

Scapens, R. W. (1994) Never mind the gap: towards an institutional perspective on management accounting practice. *Management Accounting Research* 5, 301-321

Schonberger, R. J. (1986) *World Class Manufacturing, The Lessons of Simplicity Applied.* The Free Press, New York, NY

Scott, W. R. (1995) *Institutions and Organizations.* Sage Publications, Thousand Oaks, CA

Sjöstrand, S-E (1993) On Institutional Thought in the Social and Economic Sciences. In *Institutional Change, Theory and Empirical Findings*, ed. S-E Sjöstrand. M E Sharpe, Armonk, NY

Steneskog, G. (1991) *Process Management, Konsten att styra och utveckla ett företags administrativa processer.* Liber, Malmö

Thompson, J. D. (1967) *Organizations in Action*, McGraw-Hill, New York

Turney, P. B. B. (1991) *Common Cents, The ABC Performance Breakthrough.* Cost Technology, Hillsboro, OR

Womack, J. P., Jones, D. T. and Roos, D. (1991) *The Machine that Changed the World, The Story of Lean Production.* Harper Perennial, New York

Åhlström, P. and Karlsson, C. (1996) Change processes towards lean production, The role of the management accounting system, *International Journal of Operations & Production Managemen*t 16 (11), 42-56