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Towards a Process Perspective On Organizational Learning

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Abstract

This paper explores the concept of organizational learning. The aim is on one hand to define organizational learning as an approach, which is also associated with an organizational level. A second aim is to define a clearer position for it in the change literature by associating it with the dialogue. We address these questions by means of the Dreyfus & Dreyfus model of skill acquisition and Polanyi's concept of tacit knowing. Moreover, we use a case study of six companies in the Telecom Valley Region in Northern Jutland to illustrate the main points. In these companies, we explore how they try to face continuous demands for changes in products, processes and strategies. We argue that they try to organize to facilitate dialogue and cooperation across all levels in the organization. These capabilities are decisive for these organizations since they make it possible for people to adapt and develop their knowledge to changed circumstances.

1. Introduction

Organizational learning has emerged in the 1990'ies as an approach, which should be able to solve the problems of organizational change in a new and more progressive manner. It has become a new buzzword as we have entered the so-called knowledge based economy. As a consequence, organizational change is often explained as a learning process. The learning organization (Senge, 1990) is different in this respect, since this is a concept for building organizations in a specific fashion. While all organizations may be said to be learning, all organizations are not learning organizations. This distinction is often used to separate organizational scholars from management consultants. Be that as it may, there is hardly any doubt that learning is a positive word associated with improvement of some kind and as such it cannot be questioned. The problem in this respect is that organizational learning has only been measured through the output of a change process. The criterion for success has been adaptation to the external environment. This is the underlying assumption behind March & Simon's classic "Organizations" (1958) and Cyert & March's "The Behavioral Theory of the Firm." These books are often considered as the starting point for beginning to take an interest in learning in organizations. As an example, a relatively straight line can be followed from these books to Levitt & March's (1988) article on organizational learning. The problem is however that organizational learning becomes very broadly conceptualized. By defining organizational learning only in terms of the output, any organizational change can be seen as an organizational learning process. As March (1991) argues these learning processes can be either exploitative (incremental) or more explorative (radical) in their character but the assumption behind is the same, that change is equal to learning. As a consequence, change is also equal to improvement. But why on earth should this be so? More specifically, who defines it as an improvement? Is it the management group, the employees, what kind of employees, the customers, the

suppliers, or is it the society in general. The above suggests that we should be very careful by defining change processes as learning processes, since there are important questions of power involved in almost any change process. This does not imply that we should not be interested in learning but simply implies that we need to be more precise in regard to what we define as organizational learning. As a consequence, we need to be more interested in the characteristics of the change process in order to define what organizational learning is.

There is a second problem. The word organizational is not very appropriate for most approaches within this literature. The reason is that it is generally more concerned with the individual level. For example Dogdson's (1993) review of the learning literature takes this position and so does the behavioral theory of the firm (Cyert & March, 1963). As pinpointed by Weick (1991) and Cook & Yanow (1993) this constitutes a serious problem since learning at the individual level and the organizational level is by no means the same. Actually, they may denote completely opposite processes (Weick, 1991). This discussion is a symptom of the same problem that organizational learning is unclear about the relationship between the individual and organizational level and therefore it is difficult to pinpoint exactly what we mean by organizational learning. Directly speaking, while there is genuine agreement that learning is important on all levels in organizations and at a societal level, there is much unclarity in defining exactly what we mean by that term. And if we are going to use learning as a concept for improving organizations, we need to be very clear about what we mean. This paper is one attempt to reach a clearer understanding of what organizational learning is. Theoretically, it is inspired by Polanyi's concept of tacit knowing and the Dreyfus & Dreyfus model of skill acquisition. Further, it draws on the experiences of a small case study of six companies in the Telecom Valley Region in Northern Jutland, which consists of companies in the IT-software sector and the mobile phone sector. The paper is organized as follows. Section 2 proposes a framework for approaching knowledge. Section 3, we apply the case findings to the theoretical framework. Finally, section 4 contains the conclusions.

2. Tacit Knowledge

The first concept is Polanyi's concept of tacit knowledge (1961, 1962, 1964, 1966, 1967). It is a concept, which have evoked considerable attention in the nineties in a wide range of disciplines. I believe it deserves this attention, since it does say something quite radical about knowledge. The most popular distinction is the one between explicit knowledge, which is a formal systematic articulation of knowledge, and tacit knowledge, which cannot be formally articulated. Polanyi's point is that the term "tacit" is a distinctive characteristic of knowing. We cannot speak of explicit knowing as a separate category of knowledge, because it relies on being tacitly understood and applied. As a consequence "...all knowledge is *either tacit or rooted in tacit knowledge*" (Polanyi, 1964:144). Explicit language is then just a sign-system along with other signs and a fairly standardized one for communicating knowledge. The relationship between tacit knowledge and explicit knowledge is then basically the same as the one between knowledge and signs.

The point, I wish to make by using Polanyi is then not particularly knowledge is tacit because knowledge is always tacit. The point is that knowledge is always local and tied to a particular context. When Polanyi builds up his theory, he takes his starting point in discussing the relationship between particulars

of a given context and the forming of a comprehensive entity. He claims that any attempt to define a face among thousands of people aims at (1) identifying its particulars and (2) at describing the relations between these particulars (Polanyi, 1961:123). This is the basic question, which aims at identifying the elements of a given context and what overall picture they form when they are integrated into a comprehensive whole. In this respect Polanyi argues that it is impossible to define all particulars in a given context. These are so innumerable that it is not possible to specify all of them. There is a second problem. Even if all of them could be specified, isolation from the others may change their appearance (Polanyi, 1961:124). Every time we concentrate our attention on one particular element in a context, our sense of its coherent existence is weakened and every time we move in the opposite direction, the particulars tend to be submerged in the whole. This leads to the point about particulars. They can be noticed in two different ways. We can be aware of them incomprehendingly, i.e. in themselves, or understandingly, in their participation in a comprehensive entity. In the first case we are aware of them *focally*, in the second we notice them *subsidiarily* in terms of their participation in the whole (Polanyi, 1961:128).

These characteristics of knowing may sound simple but in fact they have implications of how we understand knowledge. It implies that man can acquire knowledge without him being able to specify the grounds of his knowing and it accepts the fact that knowing is exercised within a framework that is largely unspecifiable. In this sense it recognizes that our knowing happens by integrating an innumerable number of clues coming from the outside and with all parts of our body into a comprehensive entity. It is the ability to integrate these clues, which is *tacit* because this ability is so complex that we can never come very close to specify how we integrate the number of different clues, which are part of a given context. What these clues or signs do, is to bring our preconceptions on the interpretation of the subject matter. These preconceptions are based on *experience*. As a consequence tacit knowing

> "...fuses the subsidiary awareness of the particulars belonging to our subject matter with the cultural background of our knowing" (Polanyi, 1961:134).

In other words, tacit knowing means to fuse our past experiences with the subsidiary awareness of the particulars belonging to a specific situation or event. In this sense, the borderlines between knower and known are dissolved. It is the knower who attributes to the particulars a specific meaning and character. Therefore we cannot say that the known is known on its own terms but on the contrary it is known on the knower's terms and it is dependent on history and experience.
This experience can be acquired through a great number of activities like for example training, simulation, playing, doing etc. and it is not limited to mental experiences but involves the whole body. Through experience a set of norms for performing different activities are incorporated into the body. We use these to read situations in a specific manner. This leads to a second point about knowing, which is similar to authors, who have developed the notion "distributed intelligence" (see for example Seely-Brown and Duguid, 1991 and Bruner, 1996). Bruner explains it in this fashion:

> "The gist of the idea is that it is a grave error to locate intelligence in a single head. It exists as well not only in your particular environment of books, dictionaries, and notes, but also in the

> heads and habits of the friends with whom you interact, even in what socially you have come to take as given" (Bruner, 1996:154).

Knowledge of what to think and act is not only located in a single head, it is also in the particular context and the habits of the friends with whom you interact. This includes tools, machines, information technology, weapons, pencils, paper, chairs, tables, books, notes, procedures, rituals, ceremonies, stories, bedrooms, kitchens etc. For example the work of the people in telecom valley happens in a context of clues from which they construct their interpretations and actions. Knowledge is then just as much in the IT-technologies, in the instruments, in the test equipment or in the linguistic pointers (explicit knowledge) which the colleagues use to draw attention to something, their emotions and behavior. This means that things have a "soul" and thus in some sense can be said to be living, since we attach a particular meaning to these objects and habits. It also implies that knowing has gone beyond the purely individual domain and becomes something, which happens in the relations between people and materials, tools, technologies etc. Knowing is something you do together with other people and/or in a specific place, in a specific time and maybe together with different things.

2.1. The Dreyfus & Dreyfus Model of Skill Acquisition

We can illustrate the implications of tacit knowing by relating it to the Dreyfus & Dreyfus model of skill acquisition. In this model, the Dreyfus brothers distinguish five different qualitative levels of knowing to do a specific activity like riding, swimming, driving a car, playing chess, knowing to use a computer etc. These five levels are:

1. Novice
2. Advanced beginner
3. Competent performer
4. Proficient performer
5. Expert

More specifically, the model is used to deduce two points about knowledge. The first point is that the five levels rely on the existence of a set of norms, which define the criteria for knowing. Norms serve an important function since they secure that actions can be predictably related to each other. The second point is that the shifts in levels are determined by the ability to integrate a still larger number of elements into a comprehensive whole and do the right thing. The expert for example is able to incorporate a very large number of even sometimes contradictory clues in a complex context and form the right picture of what is going on, while the novice is only capable of looking through very simple situations. It is the simplicity, which makes it possible to formalize rules describing how to behave, when specific events happen and which the Dreyfus & Dreyfus model associates with the novice or the advanced beginner. It should be noted that this usage of the model is not necessarily consistent with the original intention of Dreyfus & Dreyfus. For example the model can interpreted as though the learning goes from non-contextual to contextual knowledge. This is not the way that it is used here. In this paper the model does not denote any sequence like that as it does not propose a distinction like contextual versus non-contextual. The point that knowledge is always tacit, means simply that at any given time people try to

look through the often multiple clues in a given context. However, at the lower levels of the model people often find it hard to deduce the right picture and/or the right action faced with a given situation, because they are inexperienced and unfamiliar with the norms, which govern activities in this context. As a consequence they often must turn to written accounts and formalized rules to tell them what they should do. To form the right picture of a situation thus means to be able to perform the role, which is expected in the continuous interaction with human and non-human agents. Simply speaking he follows the norms, which have been negotiated and agreed upon in that particular context.

As before mentioned, we can say that a given level of knowing depends on the ability to integrate the multiplicity of elements in a given context and transforming this unconscious or conscious perception into the "right" action. This ability is tacit. Training is extremely important in this respect since situations can be seen from a potential large number of perspectives. The expert is extremely good at carving out the right point of reference. He knows what to do on the background of mature and practiced understanding. He knows where to focus his attention and integrate the other elements from this reference point. He is able to immediately look through the signs and form the right picture of the situation. In this sense, the experts becomes one with the situation. The blind man does not feel with a stick, he feels, the expert pilot is not flying an airplane, he flies. In normal situations, experts simply do what normally works without thinking about them. They have a superior perspective that makes them involve themselves completely and entirely in the situation. The expert air traffic controller does not see blibs on a screen but see planes in the sky and simply responds to what he sees. With expertise comes fluid performance. We normally do not think where to place our feet, what words to choose. We simply walk and talk. As Dreyfus & Dreyfus point out this does not mean that the expert does not reflect. He does when time permits and outcomes are crucial. But according to Dreyfus & Dreyfus this does not require calculative problem solving but rather carefully considering one's intuitions (1986:32). Neither is the expert always right. His knowledge is vulnerable from too many disruptions. On the other hand his flexibility is superior in the sense that he is able to incorporate quite a lot of disruptions from normal situations and still make things work because he has encountered so many different situations before and are experienced in handling them.

The four levels before reaching the level of the expert can be thought of as different qualitative levels of knowing, where the novice is the least developed. The term experience is important for the five defining the five different qualitative levels. It can be acquired through a multiplicity of different activities and it will not be attempted to create some kind of hierarchy in regard to the different activities. However, this hierarchy from expert to novice is not founded on some unequivocal and unquestionable assumptions about what it means to be an expert. The term expert is context specific. As mentioned before knowing is not something private but something collective and as such the criteria for being an expert are defined by specific norms. These define the criteria for being a good driver, a good football player, a chess player, a machinist, a banker etc. They often become visible when they are challenged, contested or directly broken. In *"The Age of the Smart Machine"* (Zuboff, 1989) there are number of examples in which IT-technologies gradually have changed the norms of a number of different jobs. As another example Flyvbjerg (1990) describes how Richard Fosbury changed the norms of a whole discipline when he flopped over the bar in the Olympic high-jump competition in Mexico City in 1968. The

presence of norms means one thing. It means that activities are relatively well known. It suggests that people follow norms and rules and thus there is a reasonable amount of consensus and agreement about these rules, that people actually choose to follow them. Consequently knowing also depends on predictability. The presence of norms does not necessarily imply any large amount of actual sharing of knowing. What it does provide is predictability of others actions. As Weick points out, the backbone of organizing is not first and foremost mutual sharing of knowledge but mutual prediction (Weick, 1979:100). Prediction is a precondition for knowing to do a specific activity. What does it mean to be an expert for example? The answer is that an expert actually depends on a whole lot of things to do the "right" thing. He must be certain that all of the different elements in a given context behave relatively predictably. Otherwise he cannot do the right thing. He cannot be an expert car driver, if the car manufacturing principles change all the time. Imagine that the breaks are suddenly on the right side instead of in the middle and the speeder is to the left. He cannot be an expert air traffic controller if the pilots are not following and understanding his instructions and fly in a reasonably orderly manner.

Understanding is then not necessarily a prerequisite for coordination and integration. The history of mankind suggests numerous instances, where we have benefited from processes, we did not and do not really understand. Examples are nuclear power plants, air planes, chemical processes and more recently also bio technology (Perrow, 1984. Weick, 1990). What we do need is that they behave relatively predictably so that actions can be predictably related to each other. It makes it possible to face the constantly changing flow of events, which organizations face everyday. Norms serve to reduce uncertainty and produce stability in an unstable and uncertain world, where many different actions and responses are possible. They are the presumptions that people can make fast adjustment and adapt behavior to the present situations. The expert in the Dreyfus & Dreyfus model is able to do this continuously and in many different situations. This is the gift of expertise, which however only covers situations, which have been experienced before and therefore are governed by an established pattern of norms. In terms of organizational learning there are in particular two points that we need to recognize:

- The first is that knowing is a collective process. It is something, which happens in a context of relations with other people and other things. Since knowing is a collective process, so is learning. Learning is not only about changing the minds of individuals. We need to consider the specific relations in which these individuals have a specific part. Thus, if we wish to change an individual, we also need to consider the specific environment, he is a part of including the relations to other people and the machines, systems, technologies, which surround him. It is the process of changing these relations, we call organizational learning, which is obviously not the same as individual learning.
- The second point is that knowing is structured around a set of norms. Therefore organizational learning should be focussed upon changing these norms. A proposition, which seems to be very close to Argyris & Schön's distinction between single loop and double loop learning (Argyris & Schön, 1978, 1996).

These propositions are however not enough to define what organizational learning is. We need to consider the characteristics of how these norms are changed. We may say that these norms are contractual relationships between people in a given context. These do not only cover written formalized

rules but also informal rules. Expectations and sanctions are attached to these relationships. The term contractual is chosen because it signals that if we wish to change these norms, a negotiation is necessary between the human agents, which constitute the system. Basically we can distinguish between two ways of changing these norms. They can be changed through coercion and suppression. These are changes, where particular individuals and/or groups of individuals force their will through on the expense of other groups. Thus, these are changed through the use of *power*. They can also be changed through *dialogue* and cooperation among internal and perhaps external actors. Dialogue and power form the ideal types on a continuum on which all changes can be plotted. There are no changes, which only are implemented through the use of power. The imagination of the pure dialogue cleansed from relations of power is equally naive because it would be equal to saying that history does not matter. Yet it is the dialogue, we wish to associate with organizational learning. Even if a pure dialogue cannot be obtained, it is no excuse for not trying to approach this situation. As a consequence, we do not demand that the power structure should be dissolved but we do require that organizations do better in involving the relevant actors in a change process, whether these are internal or external. When such a situation occurs, an organizational learning process has occurred. Dialogue and cooperation are important in this respect, since the change of organizational procedures is a collective process involving potentially a large number of people. The assumption is that the best contract is one, where all parties, which are covered by the contract, are heard. The second assumption is that a dialogical process improves the organization's problem solving capabilities, and helps solving the next problem too. As a consequence, organizational learning is seen as trying to bring or improve a capability to solve problems. The focus is not on the output side but on the process of change and the aim is to build up or strengthen a culture, which can learn.

3. Introduction to Telecom Valley

As before mentioned, the case study comprises six companies in what is called the Telecom Valley region in Northern Jutland. It is the name for a cluster of companies, which are engaged in the development of primarily mobile phones. However, two of the companies in this study are engaged in the development of software to industrial production. The proposition is that these companies are actually learning or actually trying to learn. That is they try do create a culture, which supports dialogue and cooperation on all levels in the organization. There are a number of characteristics, which support this claim. Before going further, we need to be very clear that these characteristics are the general impressions from how these companies wish to perceive themselves. If the strategy of organizational learning is actually successful is a different matter, which is not answered in this paper. As a consequence, I will not call this story a glamour story or a story of best practices. I only wish to address how they try to solve their problems and why we may associate this with organizational learning. Some company characteristics are given in table 1.

Table 1. Some Company Characteristics

Name	Number of employees	Product	Organization	Typical education
Company 1	100	Software for industry	Project	IT-engineer
Company 2	150	Cordless phone systems	Project	Engineer
Company 3	80	Development of GSM-phones	Project	Engineer
Company 4	80	Development of modems.	Project	Engineer
Company 5	90	Software for industry	Project	IT-engineer
Company 6	50	Development of mobile phones.	Project	Engineer.

The companies are relatively small. Five of them have been through expansive growth periods. Company 2 has for example grown from 50 to 150 employees in only two years and they are expecting to hire 100 engineers more in the coming years. Companies 1 and 5 have grown approximately 20% each year in the last 5 years. All of the companies are development companies concerned with developing software for the industrial automatic processes or components in mobile phones. All of them have specialized in particular niches. The employees are typically highly educated - typically they are engineers. Many of them are very young. Two of the companies are subsidiaries. The organization in the companies is centered in cross-functional project groups. None of the companies - perhaps except from company 6 - are concerned with basic research. In other words, their specialization does not lie in bringing forward the newest products with the newest technologies. Their competitive advantage lies in the capability to adopt the newest ideas and technologies and customize it to their markets. High standards of quality are associated with these products. This requires that the effects of technologies must be relatively well known. In the same time, it is clear that there is a rapid technological development in the sector, where the destruction of outdated technologies is also very big. In this sense, it is important for the companies to maintain the balance between building the newest technologies into their products and still make sure that they are reliable.

Companies 2 and 5 even have tasks, which they call "mission critical." New and rather complex technology is important for all the companies, and given the technological development it is these competencies, which are in power. In company 1 we were told that the managing director is the one who is always right in guessing what the next technology will be. In company, they have a group called the strategic technology group, which are only concerned with discussing the future for technologies. It is the founders of the company, who participates in this group. The fast changing environment has of course had its impact on the companies. Two of the companies are relatively new and founded in the nineties (companies 2 and 3). After a major crisis, company 3 was bought by a foreign parent company in 1998. Company 4 has just carried through a merger with another company and has been bought and sold several times in the nineties. Company 5 carried through a management buy-out in 1995 and became what it is today.

The key organizational unit in the companies is the project, which is a typically cross functionally organized group of people which cooperates in solving a specific temporary assignment. The work is typically knowledge intensive and requires typically people with a higher education. As a consequence

of the rapid technological development there is a continuous demand for education in the companies. The human resource function is typically well developed and in some of the companies, there is even a human resource manager. Further, the employees are almost spoiled. In some of the companies, there are very fine facilities where people can spend their spare time. There is a food policy to deliver healthy dishes and the work places are typically extremely well designed. These are signs that five of the companies have an official policy, which emphasizes that the employees are the companies' most valuable resources. Therefore, they are spoiled, they have a lot of power and they are well paid. Despite these policies, there are however problems in some of the companies. These problems are:

- One company tries to break out of their role as subcontractor. This requires to build up the marketing and sales functions and to integrate these with development of software.
- Another company has grown 200 percent in two years and it requires that people can also be trained so that quality and efficiency can be maintained.
- A third company needs to shorten development time and they will try to do that through a better structuration of activities.
- A fourth company wishes to update their quality system to contain a more adequate description of the processes between the different functions.

These are examples that the rate of change is not decreasing. In addition to following the technological development and continuously improve on existing product areas, there are challenges, which are more radical in their character. This is not something, which is a new situation. The history of their emergence suggests many instances, where more radical challenges have to be met.

3.1. Knowing in Telecom Valley.

When we argue that these companies are actually learning or at least trying to learn, it is because they try to create an organizational culture, which supports dialogue and cooperation across all organizational boundaries. They exist in an environment, where change is always occurring and capability for meeting change is decisive for their competitive advantage. As we have seen, they try to manage these changes through a flexible organizational structure, where work is organized in cross-functional work groups. Further there is a short distance between employees and management. In some companies these flat structures are combined with a human resource function, which facilitates informal human interaction through building up facilities for sparetime activities. The nice environment and the healthy dishes, which are part of the work, are only natural supplementaries to the culture. In summary, they try to build their organizations so that knowledge can flow in a network, which in principle contradicts all organizational boundaries. These are what we can call principles for strengthening the dialogue and cooperation across all levels and it is these characteristics, we associate with learning. In some of the companies, the customers participate directly in some of the project's phases. Thus the principle of dialogue expands the organizations' boundaries. As an example, it suggests one definition for an expert in this environment. In a fast changing environment, people do not become experts in one particular technology or in performing one specific narrowly defined job. Instead expertise means to be in the center of the communication and information network. Expertise is not only attached to do a specific activity but also to be able to look ahead in order to know and prepare for the next dominating technologies. In company

1 the managing director is the expert, who is always right in what becomes the next technology. In company 2, they have the strategic technology group, where all the founders meet and discuss what is next on the market. That these people are placed in the top of the hierarchy tells about what kind of capabilities, which are highly valued in these companies. The organization in all six companies invites that the employees establish a broad set of networks, from which they can get information and help. It is complex interactive technologies, which is hard to understand. Therefore people can get stuck on even seemingly small problems. Thus they need the networks also in daily operations. In company 2 for example, they have a rule, which says that the employees are not allowed to think about a problem for more than two hours. Then they have to ask someone else. The knowledge that people in the organization can be extremely important for the other functions in the organizations. Without the ability to interact and to network, people do not stand a chance in these rapidly changing environments.

The case study is interesting both as an example of how organizations learn or try to learn. They have understood that organizational learning is collective process, where different roles and different knowledge has to be adapted to each other. Therefore, the companies try so hard to create cultures, which support dialogue and cooperation. It is an environment where continuous change is necessary and therefore we witness that organizational learning happens in small daily routine activities. In general terms the tasks are so complex that there is often some element(s) of development in them. Therefore learning and change is normal for them. It is not the survival of organization, which this kind of organizational learning secures. Almost all of the companies have undergone dramatic changes in terms of ownership during their relatively short history. But the personal networks and the knowledge, which flows in them, have been able to survive and even expand in the past decade and probably will in the next one too.

4. Conclusions

This paper has tried to define an approach to organizational learning, which is both organizational and takes an interest in the process of change rather than the output. It has defined organizational learning as a dialogical process instead of just focussing on the output side. Further it has demonstrated how organizational learning processes may look like in organizations. But as any other perspective in organization theory, it has its limitations. There is no guarantee for success, if organizations choose to follow a strategy of organizational learning. As we have also argued in this paper, knowledge is local in its character. It cannot be located outside of any context. This means that the established practices communicate specific interests and intentions and limit and enable organizational change to follow certain paths. This is a consideration, which is taken into account in the approach to organizational learning, which has been advocated in this paper. It however also suggests that an organizational learning strategy must find a way to please the already established power structures in an organization even if the goal of organizational learning is change through dialogue. It is this tension between power and dialogue, which organizations must be able to handle.

As a consequence, an organizational learning strategy leads rarely to the radical changes in the short run. It is a strategy for improvement through a series of small steps, which change the strategies and practices of an organization in the long run. A process of change, which Mintzberg, Ahlstrand & Lampel's (1998) call "strategy formation as an emergent process." This is also a picture, we can recognize from Telecom

Valley. Changes in products, processes and strategies are always going on in these companies and yet these changes are always controlled, since the number of uncertain elements in the tasks most often can managed. What they do is to take new technologies and ideas and integrate them into the existing context through a process of translation to use a term from Czarniawska & Joerges (1995) and Sevon (1996). The cross functional project organization in the companies is one way of making sure that changes in technologies and strategies are a controlled process, where things change through solving the "routine" tasks of the organization. In this way these new technologies are translated to the organizations own traditions, habits and context and it is done in a way so that the different functions involved are adapted to each other.

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