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## EDUCATION AND SOCIAL CONSTRUCTION OF MANAGERIAL PRACTICE\*

Educational background and professional categories are the main motivators of managerial actions: what you look at determines what you see and what you see determines what you do – confess the authors of the writing. Among others they seek to answer to account for the fact that one group of companies prefers to employ people with business background and the other those with technological background.

Modern business managers in industrial countries are well-educated people, and very often they have a degree from a university or other institutions at university level. In Norway, most business managers have their degree from a business school or a technical university. This observation raises some interesting questions. First, how should we explain why some companies prefer managers with a business degree and other companies managers with a technical educational background? Second, what influence – if any – does the manager's educational background and professional affiliation have on strategic decision making in organisations? Previous research on decision making (among others Simon, 1957; Cyert & March, 1963; Child, 1972) emphasis that decision makers search for information in a limited space before taking decisions, and that they only take satisfactory decisions for the given situation. Our hypothesis is that educational background and professional affiliation might be an influential force that limits the action space the managers perceive for the organisation they manage.

The interest for this topic is primarily related towards getting more insight in managers' cognitive processes

and better understand why they make the strategic decisions they make. This insight into the managers' cognitive processes might also enable the managers to improve their ability to manage organisations. Much of what has been written about organisation and strategic management have focused mainly on behaviours and outcomes, without an in depth understanding of the cognitive processes that influence those behaviours and outcomes. This paper is a starting point on a further study on this topic with particular focus on educational background and strategic choices.

The first part of the paper presents some principle assumptions that this study will be based on. Further on, we present some concepts that might give insight to the cognitive processes that might influence managers in strategic decision making situations. We also present some results of a study of the educational background of the managers in Norway's largest manufacturing companies in 1991 in order to clarify which managers this study should take into account. At the end of the paper, we will raise some further research questions based on the theoretical perspectives we have discussed and the empirical findings presented.

Managerial practice is not only influenced by the managers' educational background and their experiences. The process of transferring knowledge through graduates

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from an educational institution to practice takes place within a context, which is constructed by the nation's industrial structure, governance structure, social structure and culture. In this paper, however, we will not go into any detail on these processes, but focus on some theoretical perspectives that are relevant for the understanding of how educational background may have contributed to construct the lenses through which managers see when they make strategic decisions.

### Theoretical Foundations

The underlying assumption of the paper is the belief that the world is socially constructed (Berger & Luckmann, 1967), meaning that people's perception of the reality is a mirror of the external environment, and that people invent their own way of understanding the reality by making some kind of social order or cosmos (Bjartveit & Kjærstad, 1996). Social order is a human product, or, more precisely, an ongoing human production. It is produced by man in the course of his ongoing externalisation, which means the way he compares himself with the environment he is a part of. A human being must ongoingly externalise itself in activity. The inherent instability of the human organism makes it imperative that man himself provide a stable environment for his conduct (Berger & Luckmann, 1967). Man himself must specialise and direct his drives. These biological facts serve as a necessary presupposition for the production of social order. Social order exists only as a product of human activity. As in the words of Berger & Luckmann (1967:70): „Both in its genesis (social order is the result of past human activity) and its existence in any instant of time (social order exists only in so far as human activity continues to produce it) it is a human product.“

The theoretical foundation for this paper lies in the theories of Simon (1957) on bounded rationality, Cyert & March (1963) on problemistic search, Child (1972) on strategic choices and the managers' role in the strategic decision process, and finally Weick (1969) on enactment of the environment.

Simon (1957) emphasizes that there are limits of rationality which derive from the inability of the human mind to bring to bear upon a single decision all the aspects of value, knowledge, and behaviour that would be relevant. Human rationality operates within the limits of a psychological environment. This environment imposes on the individual as „givens“ a selection of factors upon which he must base his decisions. The deliberate control

of the environment of decisions permits not only the integration of choice, but its socialisation as well. Social institutions may be viewed as regularisations of the behaviour of individuals through subjection of their behaviour to stimulus-patterns socially imposed on them. This viewpoint is of particular interest when looking at the connection between educational background and strategic decisions. In this paper, the focus is primarily on the fact that social order (the way you view the world) is a result of past human activities. We will in particular focus on how the socialisation process that takes place during higher professional education might influence or have impact on bounded rationality in managers' strategic decision making.

Cyert and March (1963) base their work on the behavioural theory of the firm on Simon's (1957) concept of bounded rationality. One of the four major relational concepts are of particular interest for studying connections between educational background and strategic choices, namely the concept of problemistic search. The most interesting aspect with the concept of problemistic search for alternatives to decisions is the simple-mindedness in search for alternatives. The rules for search are seen as simple-minded because they reflect simple concepts of causality. According to Cyert and March, managers only search in the „neighbourhood“ of familiar alternatives in attempting to develop solutions to the organisation's problem. An interesting question to reflect on is whether these simple concepts of causality are influenced by the manager's educational background or not.

Another underlying assumption for this paper is that the manager plays a significant role in setting the direction for the organisation. We base this assumption on Child's strategic choice argument (1972). He argues that while there are constraints on managerial-decision discretion, managers still have significant latitude for making choices. Decision makers have more autonomy than that inferred by those arguing for the dominance of environmental, technological, or other forces. The point is that the choice of domain and its complementary activities and tasks are chosen by management. Secondly, organisational effectiveness should be construed as a range instead of a point, because managers do not optimize in their decision making. In other words, they make choices that are good enough (bounded rationality). The range between maximizing and „good enough“ creates an area in which managers can utilize their discretion. Thirdly, organisations occasionally have the power to manipulate and control their environments by entering into informal



relationships with competitors to limit the serverity, scope, and danger posed by the competition. According to Weick (1969), who introduced the concept of environmental enactment, where he argues that managers do not respond to preordained environmental conditions but instead create their own environments through a series of choices regarding markets, products, technologies, desired scale operations, and so forth. Given the range of choice regarding each of these factors, the number and kinds of different environments which might be enacted are theoretically limited only by man's imagination. The type of environment which managers can enact is severely constrained by two broad factors: existing knowledge of alternative organisational forms, and managers' beliefs about how people can and should be managed. The ability to enact a new or different environment is significantly constrained by what is known about allocating, structuring, and developing resources in the form of organisations. We expect to find that this knowledge is heavily influenced by the manager's educational background. Fourthly, perceptions and evaluations of events are an important intervening link between environments and the actions of organisations. Decision makers evaluate the organisation's environment, make interpretations based on their experience, and use this information to influence the organisation.

Clearly, the manager's perception of the reality in relation to strategic decision making is complex and is created by many influential factors. However, in order to cope with this question we have to make some assumptions. To summarize the above discussion, we base our further discussion on the beliefs that the manager in a strategic decision process is exposed to bounded rationality, that he only searches in a limited area in order to discover decision alternatives, and that the manager in fact plays a significant role in setting the direction for the organisation.

We will further on present some concepts that might explain why educational background might influence strategic decision making. These different concepts serve as a starting point for a further empirical study on the topic. We classify the following concepts in two categories - concepts that are related to the decision maker's individual cognitive processes in decision making, and concepts that are related to decision makers as a group (common cognitive processes) in strategic decision making. For the first category we have chosen the concept of mental models or schema (Lord & Foti, 1986; Lakoff, 1987; Stacey, 1993) and the concept of institutionalisa-

tion and the creation of identity (Berger & Luckmann, 1967). The second category (group level) consists of the concept of field of knowledge (Ringer, 1992); the creation and sustaining of paradigms (Kuhn, 1962), and the meaning of professional networks (Savage, 1994; Amdam, 1996b).

### Perspectives on Strategic Decision Making and the Manager's Educational Background

In this part of the paper, the emphasis is put on concepts that might be interesting to look further into in order to understand the eventual connection between the manager's educational background and his strategic choices on behalf of the organisation he manages.

#### Mental Models or Schema

The concept of mental models is closely linked to learning and cognition (Lord & Foti, 1986; Lakoff, 1987; Stacey, 1993). Mental models are the simplifications that humans construct and store in their brains of the world they encounter. These models are the lenses through which we perceive the world we have to operate in, the constructions we make to explain how it and we are behaving, the structures we use to design our actions. These models are based on loose flexible categories of information, where categories appear to be defined in fuzzy terms of similarity and irregularity. In totally new situations, we use processes of analogous reasoning to construct new mental models using those already stored. Coping with the world can be seen as a continuing feedback from one set of models to another. Our mental models determine not only how we make sense of the world, but how we take action, i.e. the strategic choices the manager makes, what he sees as distinguished competitive advantages etc. Until people can test and improve their mental models they will inhibit meaningful changes in an organisation. Another related way of defining mental models is to schema theories. Schema can be defined as a cognitive structure that represents organised knowledge about a given stimulus - that is a person or situation - as well as rules that direct information processing (Lord & Foti, 1986). A schema provides observers with a knowledge base that serves as a guide for the information, actions, and expectations. Schemas help people simplify and effectively manage the information related to a complex task.



We automate our mental models by pushing them into the unconscious – this is the process of becoming an expert. A person would function very slowly if for every action he had to consciously retrieve and examine large numbers of previously acquired mental models and then choose an appropriate one. Experts therefore „push“ previously acquired models below the level of awareness into the unconscious mind. The expert seems to use some form of recognisable pattern in a new situation automatically to trigger the use of past models developed in relation to previous situations. Experts do not examine the whole body of their expertise when they confront a new situation. Instead they detect recognisable similarity in the qualitative patterns of what they observe and automatically produce models which they modify to meet new circumstances. Some models, the expert ones, are therefore implicit and hardly ever questioned while others are explicit and are more likely to be questioned. The latter are the explanations of what we are doing that we articulate.

Simply by being part of a group, individuals learn to share mental models they use to discover, choose and act. In this way they cut down on the communication and information flows that are required before they can act together. In particular, the more they share those implicit expert models that have been pushed into the unconscious, the less they need to communicate in order to secure cohesive action. This is exactly what Kuhn (1962) was referring to as the paradigms that governs the conduct of ordinary science. We share the expert unconscious models when we work together in a group. Individuals who are part of any group (e.g. professional affiliation) are put under strong pressure by group processes to conform, that is to share the mental models of the other members (Stacey, 1993). Professional affiliation and educational background may be underlying explanatorial factors that influence and create these expert unconscious models.

A more developed theoretical framework that can explain the process of becoming an expert, is Lakoff's (1987) concepts of categorisation and the development of prototypes. A previous conscious model, often in competition with other models, how to solve some specific problem is becoming common sense. However, nothing is „just“ common sense. Common sense has a conceptual structure that is usually unconscious. During this process of common sense making we develop categories. The radial categories are the most common of human conceptual categories. They are not definable in terms of some

list of properties shared by every member of the category. Instead, they are characterised by variations on a central model. Take for instance the categories environment and employees in management, which might be perceived quite differently by different groups of managers. The central members of radial categories are one subtype of a general phenomenon called „prototypes“. A prototype is an element of a category (either a subcategory or an individual member) that used to represent the category as a whole in some sort of reasoning (Lakoff, 1987). All prototypes are cognitive constructions used to perform a certain kind of reasoning; they are not objective features of the world.

#### **Institutionalisation and The Creation of Identity**

Universities and business schools are institutions. In this part of the paper we like to elaborate on the role of these institutions related to the creation of managers' perceptual maps meaning that institutionalisation and the creation of identity might have an underlying effect on all the elements in the preliminary model. This discussion is mainly based on Berger & Luckmann (1967), and according to them all human activity is subject to habitualization. Any action that is repeated frequently becomes cast into a pattern, which can then be reproduced with an economy of effort and which is apprehended by its performer as that pattern. Habitualization further implies that the action in question may be performed again in the future in the same manner and with the same economical effort. The concept of mental models (Lord & Foti, 1986; Lakoff, 1987; Stacey, 1993) is related to the same issue. Habitualization carries with it the important psychological gain that choices are narrowed. The processes of habitualization precede any institutionalisation (Berger & Luckmann, 1967). Institutionalisation occurs whenever there is a reciprocal typification of habitualized actions by types of actors. An institution creates social order for its members, and with social order simplification and economical effort follows. An interesting question to ask, is to what extent and in what way the educational institution where the manager received his education, created social order in the head of the manager.

Institutions further imply historicity and control. Reciprocal typifications of actions are built up in the course of a shared history. They cannot be created instantaneously. Institutions always have a history, of which they are products. It is impossible to understand an insti-



tution adequately without an understanding of the historical process by which it was produced. As we conduct a study of educational institutions in order to better understand the connection between a manager's educational background and his managerial practice, it is natural to study the historical development of the related educational institution. The development of the society and the development of the curriculum in the educational institutions will clearly affect each other.

An institutional world is experienced as an objective reality (Berger & Luckmann, 1967). It is important to keep in mind that the objectivity of the institutional world, however massive it may appear to the individual, is a humanly produced, constructed objectivity. A main idea is that some kind of socialisation takes place during higher professional education. This socialisation process is often referred to as secondary socialisation (Berger & Luckmann, 1967). The beginning point of the socialisation process is internalisation: the immediate apprehension or interpretation of an objective event as expressing meaning, that is, as a manifestation of another's subjective processes which thereby become subjectively meaningful to myself. Internalisation is the basis for an understanding of one's fellow men and, second, for the apprehension of the world as a meaningful and social reality. The ontogenetic process by which this is brought about is socialisation, which may thus be defined as the comprehensive and consistent induction of an individual into the objective world of a society or a sector of it. The most fundamental primary socialisation takes place during childhood, through which (s)he becomes a member of society. Secondary socialisation is any subsequent process that inducts an already socialised individual into new sectors of the objective world of this society. Primary socialisation is usually the most important one for an individual, and that the basic structure of all secondary socialisation has to resemble that of primary socialisation. According to this argument, research on the relationship between educational background and managerial practice should include research on whether different people are recruited as students of business schools compared to technical universities, and if so, if this reflects any differences which may be traced back to primary socialisation.

The main focus here, however, is on secondary socialisation. Secondary socialisation is the internalisation of institutional or institution-based „sub-worlds“. Its extent and character are therefore determined by the complexity of the division of labour and the concomitant social distribution of knowledge. Secondary socialisation

is the acquisition of rolespecific knowledge, the roles being directly or indirectly rooted in the division of labour. In modern business education there is a certain emphasis on the professional rôle of the manager (management as profession), but as we have seen, business schools in Norway originally emphasised professionalism as for example in accountancy. This change is crucial for our understanding of the function of the business schools. In the engineering schools the emphasis is more on professionalism in terms of being an engineer. It seems like nearly by coincidence that engineers become managers. And even after becoming a manager, the engineer's professional knowledge seems to play an important role as a creator of authority (Kvålshaugen, 1994).

### **Perspectives on Strategic Decision Making and the Managers as a Profession Group**

In Norway, the educational background of managers are quite homogenous, therefore we start out the next section of this paper by presenting an overview over the educational background of Norwegian managers in Norway's largest manufacturing companies in 1991. Our hypothesis is that the educational background of the managers might even be more influential in strategic decision making situations when facing a management team with quite homogeneous educational background and professional affiliation.

### **The Educational Background of Norwegian Managers in 1991**

Traditionally, engineers have been the dominating profession among managers in Norwegian industry. Modern industries emerged in the beginning of the 20th century when several large companies within electrochemical, electrometallurgic and pulp and paper industries were established based on rich hydroelectric resources. Within these industries engineers had a key function, which is reflected in the educational background of the top managers of Norway's 30 largest companies in 1936 (Amdam, 1994). At that time, fifty percent of the managers were engineers (Hanisch & Lange, 1985). Some of them had graduated from foreign technical universities, and some from the technical university in Trondheim, which was established in 1910 to supply the growing industrial sector with engineers. When it comes to business education, the first Norwegian business school in Bergen was not established until 1936 (Jensen &



Strømme Svendsen, 1986). However, after World War II the number of business school graduates among top managers increased. Especially from the 1970s a considerable number of the managers were graduates from business schools (Amdam, 1993).

If we move to the 1990s, a study of the educational background of the top managers in the largest manufacturing companies in Norway in 1991 shows that gradu-

ates from business schools dominated. As we can see from Table 1, 43 per cent of the managers had a higher degree from a business school as their main highest education compared to 34 per cent with a degree in engineering. However, some of the managers had additional exams from other higher educational institutions than the one they originally graduated from. If we include lawyers, engineers and graduates from an agricultural

Table 1

The Educational Background of 70 Managers among the  
80 Largest Norwegian Manufacturing Companies, 1991

Highest education	Number	Number	Percent
Higher degree in business administration, total		30	42,9
Higher, upper level, 4+ years (Siviløkonom or MBA)	28		
Higher, upper level and additional studies in sociology	1		
Higher, lower level, 1-3 years (Bedriftsøkonom)	1		
Lower degree in business, secondary level (Handelsgymnas)		1	1,4
Higher degree in engineering, total		24	34,2
Higher, higher level, 4+ years (Sivilingeniør)	16		
Higher, higher level and additional studies in business administration	5		
Higher, lower level, 2-3 years, and additional studies in business administration	3		
Higher degree in law, total		6	8,6
Higher, and additional studies in business administration	1		
Higher degree in agriculture, with additional studies in business administration		5	7,2
Higher degree from Military Academy, with additional studies in law and business		1	1,4
Higher degree in natural science		3	4,3
Total		70	100

**Source and comments:** The table is based on a list of the 100 largest manufacturing companies by turnover taken from *Norges største bedrifter 1991* (Oslo, 1992). The educational background of the managers of these companies has been identified through Årets NØRINGSLEV 1991, annual lists of graduates from different educational institutions, and from telephone interviews. The number of companies in this database has been reduced from 100 to 80, since some of the companies in reality were divisions of another company. Only the top managers have been included, and only those (70 of 80) to whom we know the educational background for sure. Five of the 70 managers were foreigners who worked in the oil industry (3 with higher degree in natural science, and 2 with higher degree in engineering). The construction of this table has been made possible by a grant from the Business History Foundation, the Norwegian School of Management, which financed a research assistant for a short period. We want to thank Yngve Nilsen for very good assistance.



university who also had passed an exam at a business school after they had finished their main higher education, as much as 65 per cent of the top managers had studied business.

It is possible to go deeper into the managers' educational background by investigating which schools they graduated from, and also when they graduated. Doing this opens the way for concrete empirical studies of the relationship between education and managerial practice. In this paper, we have done this for those who have studied business. A closer look at the 29 managers with a four-year study in business administration (*siviløkonom*) shows that as much as at least 55 per cent of them had graduated from the Norwegian School of Economics and Business Administration in Bergen, the oldest Norwegian business school established in 1936. 10 per cent had graduated from the Norwegian School of Management in Oslo. This school was established in 1943, and from the beginning it offered programmes at a lower level than the school in Bergen. Only graduates after 1971 could call themselves *siviløkonom*, like the graduates from Bergen (Amdam, 1993). Most of the remaining business school graduates had studied abroad (25 per cent). For 10 per cent we have no data concerning which business school they graduated from.

These figures show that the Norwegian School of Economics and Business Administration had a key role among the institutions that served Norwegian industries with top managers in the beginning of the 1990s. Among the managers with this background, 63 per cent had graduated between 1960 and 1971, and 19 per cent from 1972 and later. If educational background has any influence on managerial practice, a detailed study of this business school as producer of knowledge, norms and values in the 1960s is a necessary topic for further studies. What we do know, is that management was almost not taught as a subject in this period, and that the educational programme was dominated by economics and business economics. The primary aim of the school was to educate good specialists in different fields of business administration, like accounting, marketing, and administrative work, and not general management (Jensen & Strømme Svendsen, 1986). In this way, the school was primarily influenced by the German Handelshochschule tradition, and not by the American business school tradition (Amdam, 1996a).

Graduates from the other business school, the Norwegian School of Management in Oslo, were few among the top managers compared to graduates from the business school in Bergen. This finding is not surprising,

since this private school in Oslo did not change into an academic business school until the 1970s, and was not approved by the government as a business school on equal level as the business school in Bergen until 1985 (Amdam, 1993). However, the Norwegian School of Management had an important function in training top managers. While few of the school's graduates had climbed to top management position of the largest companies in 1991, many managers with another professional affiliation had used the school's one year programme in business administration to achieve basic business administration knowledge. Of 15 managers who had studied business after a degree in engineering, law, agricultural science or at the Military Academy, nine had taken this one-year programme at the Norwegian School of Management after graduation, while three had additional studies at the Norwegian School of Economics and Business Administration. This one-year programme was not any executive programme in management, but a basic undergraduate programme in business administration designed for the mass market of education (Amdam, 1993).

Since most Norwegian managers either have an educational background as civil engineer or *siviløkonom*, the management teams in Norway to a large extent are composed by those two groups as far as educational background are concerned. This fact makes it interesting to study the common group cognition processes in management teams in strategic decision making situations. We will therefore discuss some concepts that might give us a better understanding of the management teams common perception of the reality they are facing when making strategic decisions for the organisation they manage.

### Fields of Knowledge and Paradigm

The concept of fields of knowledge may be a useful starting point for a discussion of the relationship between education and strategic decision making in management groups. This concept is developed by Fritz Ringer (1992), and is strongly inspired by Pierre Bourdieu's concept – intellectual field'. The concept of fields of knowledge includes the social context which educational institutions at higher level are a part of. A field of knowledge encompasses a unity of agencies in different positions. The field is not only a sum of these agencies, but also the configuration or networks between these. Thus, a field of knowledge consists of actors, practice, organisations, academic



disciplines and the ties between them within a field carried by a unity consisting of knowledge that is shared. According to Bourdieu (1969), an academic culture may be defined as an intellectual field, and this culture encompasses both practices, institutions, social relations, and shared knowledge and values.

Used on business education, we may say that the knowledge which is embedded in business administration represents the shared knowledge within a field of knowledge. The business schools with their curricula and the values and norms they represent are also included in this field. Graduates and their practice are other parts of the field. Within this field of knowledge values are developed and shared. These will be different from one field of knowledge to another, for instance the field which includes the engineers, even though engineers may share practice with graduates from business schools. The different actors within a field of knowledge are in principle equal, and they are dependent on each other. Changes in for example practice may therefore influence the other actors of the field. If for instance an increasing number of the business school graduates start working with the environmental problems that represent firms' challenges, this will over time most likely be reflected in the curricula of the business schools.

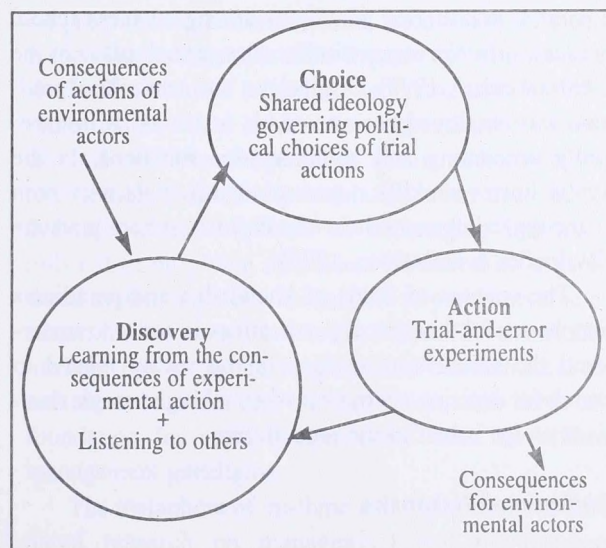
Within a field of knowledge, actors develop and share common paradigms. What every one of us sees, understands and does in any situation depends on the perspective from which we view the situation. Such a perspective is called a paradigm, a very general way that each of us uses to make sense of the particular world we are operating in. A paradigm (Kuhn, 1962) is the set of preconceptions we bring from our past to each new situation we have to deal with. The paradigm is, as it were, the lens through which we look at the world, and it therefore influences what we perceive. A paradigm is a set of beliefs or assumptions we have about the world, normally beneath the level of awareness and therefore mostly never questioned. As we live and work with other people we come to share a particular way of focusing on the world, and shared paradigm determines what explanations we develop and agree upon amongst ourselves. The origins of all our explanations of everything, therefore, lie in the process of socialisation, in the shared cultures formed by people in groups (Berger & Luckmann, 1967). The paradigm flows from shared past experience, and it is reflected in our skilled behaviour, that is the rapid actions we take automatically to perform complex tasks without thinking about how, and often why, we are performing

them (tacit knowledge). A new paradigm can eventually come to be shared only through a political process of persuasion and conversion.

Our paradigm, then, ultimately determines what we do in every sphere of life – it comes before any visions we may form and it is prior to any rational analysis. For example, the development of every science is conditioned by the paradigm that a particular community of scientists share (Kuhn, 1962). In the same way, the paradigm shared by scholars, students, consultants and practitioners of management also determines the explanations and prescriptions they put forward on organisational success. Underlying this discussion lies an assumption that during the managers' professional education they are socialised into certain specific types of management paradigms.

Figure 1

Discovery, choice and action  
(adapted from Stacey, 1993)



These norms and values are expected to influence what managers perceive and emphasis in the reality. How you focus determines what you see, and what you see determines what you do. These relations are exemplified in the following model:

How and what you discover (your paradigms and the perceptions they lead to), meaning the lenses through what you perceive in the reality, directly affects what you choose to do since you cannot choose what you have not perceived, and that choice in turn determines your actions. It is through your actions that you make further discoveries, leading to other choices and actions in a con-



tinuing feedback loop. Furthermore, it is your paradigm, how you focus, that determines how you go around the feedback loop. How you go around the loop determines the patterns of change in the behaviour you generate, that is the dynamics of your behaviour. The paradigms shared by the managers in an organisation will therefore determine how they practice strategic management and what strategies they pursue (Stacey, 1993).

Further, we will also take into consideration the fact that the paradigms of a profession may change over time. According to Neil Fligstein (1987), American management has changed when it comes to the conception of management and organisation. While the dominating paradigm of the managers from 1919 to 1939 was that of an engineer seeing the challenges as manufacturing challenges, the challenges were mainly defined as marketing problems from the Second World War II, and as financial challenges from the 1960s. The first change may explain why business school graduates displaced engineers as the typical American manager, while the second change had a parallel in changing paradigms among business school graduates. In Norway, a similar change took place in the 1980s (Amdam, 1993). Originally a business school graduate was employed because of his or her skills in especially accounting and administrative functions. In the 1980s, however, skills in general management were seen as the typical characteristic of a business school graduate (Byrkjeflot & Halvorsen, 1996).

The concept of fields of knowledge and paradigms may be useful theoretical perspectives in order to understand the selective perception of the reality related to search for decision alternative when taking strategic decisions on the behalf of the organisation.

### Professional Networks

In a study of the American pharmacist profession, Deborah Anne Savage (1994) defines a profession as a network of alliances across ownership boundaries among practitioners who share knowledge. This knowledge is crucial for the organisation's survival. By defining a profession as a network, Savage defines it as an economic institution different from markets and firms. A network accomplishes the exchange of capital, products, and/or knowledge without explicit equity investments or ownership. Applied to professions, a network implies a community of practitioners operating separately for many purposes, but dependent on the network for the maintenance and development of knowledge that might be prof-

itable. According to Savage, these professional networks cross firm boundaries. Members may be found in different companies, but also in for instance academic organisations like universities and hospitals. Within the networks, the members share a common body of knowledge, but this is implemented in different contexts. The knowledge is thus likely to be idiosyncratic: too abstract to be internalised by a hierarchical organisation, too tacit to be bundled and sold in an external market.

This characteristic of professional networks implies that professional networks have a distinct function that should be considered when explaining managerial behaviour and organisational changes. At the company level, members of professional networks serve two purposes: that of the company, and that of the profession they belong to. Their behaviour will depend on whether they identify themselves with the profession or with the company. This dual position may have an impact on business performance in the way that the aims and interests of a professional group may influence business decisions. This influence is dependent on the position a profession has within a company.

A study of managerial practice in the Norwegian company Nycomed shows the relevance of the professional networks concept (Amdam, 1996b). During the 1920s the company, which then was called Nyegaard & Co., was one of the first Norwegian companies to introduce corporate research. It established a small R&D department directed by the pharmacist Per Laland. This department especially worked with developing new products based on vitamins. What was characteristic for this company was that it invested in research during several decades despite few scientific and commercial breakthroughs. In fact, the breakthrough came as late as around 1970, when the company invented the first non-ionic X-ray contrast medium which changed the company to a profitable international pharmaceutical company (Amdam & Sogner 1994).

The concept of professional networks may explain why the company invested in research year after year despite losses. A closer look at Per Laland and his colleagues in the interwar period reveal that they were part of a professional network of researchers at the University of Oslo, the National Hospital of Norway, Cambridge University, and at the British pharmaceutical company Glaxo. The competence which constructed this network was a joint interest in vitamin research. Being a part of such a professional network meant that their behaviour should be studied both in relation to the network and to



the firm they were employed. If they wanted to be awarded and to enhance their reputation within the network, they had to participate in the scientific debate by publishing in academic journals and participating at scientific conferences. If they wanted to enhance their reputation within the company, they had to contribute to making the firm profitable. Both these aims developed to become a major force of their work. Within the network their reputation grew, partly because they were able to convince the firm's management to finance some research projects at the university and the National Hospitals. They also published actively, and among their colleagues at Glaxo their reputation grew when they in the late 1930s were able almost to isolate the active substance in liver that cures pernicious anaemia. A researcher connected to Glaxo later completed this process when he discovered vitamin B12. The problem according to our argument, is that this activity was not profitable for the company, at least within a short time horizon. However, management was patient, and developed a long-term view on research and profitability. This horizon was not typical for Norwegian companies at that time. The researchers' affiliation to the professional network may explain this change in strategy. Since the researcher achieved reputation within the network, and since management was more and more dominated by pharmacists who appreciate this reputation, management developed a strategy which included a patient long-term horizon on research. They became convinced that research sooner or later would be profitable, which also turned out to be true. We may assume that similar processes also take place among today's managers depending on which professional networks they belong to.

### Research Questions

In the final part of the paper we will raise three questions for further empirical research. The intention is to elaborate more on the connection between the different concepts presented and discuss which elements that influence managers' limited search (Cyert & March, 1963) in strategic decision making situations. The concept of limited search is founded in Simon's (1957) concept of bounded rationality. We also assume that the manager play a significant role in setting the direction for the organisation (Child, 1972).

**Question 1:** Could managers with an educational background as civil engineers be classified as one prototype,

opposed to managers with an educational background as siviløkonom?

An underlying belief is that during education, a set of norms and values are created. We expect to find that the graduates who were taught under influence of the mechanical paradigm (human being as a machine) might develop different sets of norms and values than graduates taught under influence of the functionalist paradigm (human being as an organism).

Burns & Stalker (1961) did a landmark contribution to the understanding of the need for different management systems related to the environment the organisation operates in, when they described the mechanistic and organic systems of management. These two distinctions in management systems are interesting to our study in relation to how the managers perceive their environment, which among other things might affect the way managers organise their companies. The mechanistic system were characterised by high complexity, formalisation, and centralisation. They performed routine tasks, relied heavily on programmed behaviours, and were relatively slow in responding to the unfamiliar. Organic systems were relatively flexible and adaptive, with emphasis on lateral rather than vertical communication, influence based on expertise and knowledge rather than on authority of position, loosely defined responsibilities rather than rigid job definitions, and emphasis on exchanging information rather than on giving directions. However, no organisational system is purely mechanistic or purely organic but, rather, moves toward one or the other. This contribution has been met by general support in the research areas connected to business and administration, and serve as a foundation for more contemporary work on different management paradigms.

The metaphors of machine and organism have dominated research on management and organisations. Historically, business management emerged as a recognised profession in connecting to the industrial revolution in the end of the 19th century (Levie, 1993). To gain recognition as an intellectual discipline, its founders felt they had to choose between science and the arts. Since industry was the product of engineering (a science), and the mechanical engineers who found themselves managing their new industry were educated within a mechanical paradigm, their choice was a mechanical approach to management. This is later classified as the mechanical paradigm (Levie, 1993) or mechanistic system (Burns & Stalker, 1961). The mechanical paradigm of orthodox economics adopts a Platonic perspective of the world as a



machine, rational in its actions, and obeying simple, universal laws. In the machine organisation (Morgan, 1980) they seek to design organisations as if they were machines, and the human beings expected to work within such mechanical structures are to be valued for their instrumental abilities (engineering). Taylor's conception of economic man and Weber's concept of the faceless bureaucrat extend the principles of the machine metaphor (Morgan, 1980) to define the view of human nature which best suits the organisational machine.

**Question 2:** A topic for empirical research could be to what extent and in which way the civil engineers still are heavily influenced by the mechanical paradigm of management or not, for instance related to the socio-technical system approach (Trist & Bamforth, 1951). This topic should not only be studied in relation to possible changes in the curricula and the values and the norm creation process at the technical universities, but also in relation to the fact that more and more engineers as shown in Table 1 seem to combine a technical higher education with an additional education in business.

According to Gioia & Pitre (1990) the functionalist paradigm has been and still is the dominant research tradition in management research. The functionalist paradigm is characterised by an objective view of the organisational world with an orientation toward stability or maintenance of the status quo. The functionalist paradigm seeks to examine regularities and relationships that lead to generalisations and (ideally) universal principles. The functionalist paradigm focuses upon understanding the role of human beings in society. Behaviour is always seen as being contextually bound in a real world of concrete and tangible social relationships. The organism metaphor (Morgan, 1980) or the organic system (Burns & Stalker, 1961) are terms that quite well describes the way the human being and organisations are approached in the functionalist paradigm. The term „organism“ has come to be used to refer to any system of mutually connected and dependent parts constituted to share a common life and focuses attention upon the nature of life. An organism is typically seen as a combination of elements, differentiated yet integrated, attempting to survive within the context of a wider environment.

**Question 3:** A topic for empirical research is to look into the functionalist paradigm related to education in management and business, and try to elaborate in what way this paradigm has influenced the business school graduates' view of management, and in what way and to which

extent the functionalist paradigm differs from or is equal to the mechanical paradigm, and what consequences this has for strategic decision making.

To be more concrete, we like to give some examples that might further explain how the concept of the different types of management paradigms can give a better understanding of Norwegian managerial practice. We may suppose that the processes of norm and value creation as well as the curricula have been different in the technical universities as opposed to business schools. Technical universities and business schools have therefore contributed to create different paradigms among the two professional groups. We suppose that a manager's primary affiliation will be to the school where he or she received his or her first degree, and not the school where they took an additional degree. As shown in Table 1, a considerable number of Norwegian top managers have studied other topics (mainly business) in addition to their main degree (mainly in engineering and agricultural science). The impact of such combinations of degrees on the creation of paradigms should therefore be studied further.

Studies of Norwegian managers show that there seem to be some types of management paradigms that might be traced back to professional educational background (Kvålshaugen, 1994). Civil engineers tend to have a strong focus on doing (constructing), while graduates from business schools (*siviløkonom* in Norwegian) tend to have a strong focus on analysing. Traditionally an engineer will see the firm's challenges through the lenses saying that technical or production challenges matters most. Management means to take technical decisions. Interviews with Norwegian managers who are engineers support this (Kvålshaugen, 1994). For instance, in an engineering firm there was a heavy focus on the manager as both being a professional (meaning an engineer) and a manager. The managers were typically most comfortable in the role as an engineer: „*Management is something we do in the evenings and the nights. During daytime we are engineers*“, one manager said. Another employee said: „*The managers try to avoid the human side of management. They focus on their engineering tasks instead of the human resources in the organisation.*“ These phrases are only examples that might be interesting to look further into. Managers with an educational background as an engineer, might be influenced by quite different management paradigms as well. Other factors than educational background that might influence the management paradigm can be type of firm, type of industry, composition of the management team, previous work experience etc.



## Conclusions

Decisions makers have a limited field of vision, and these limitations are among others partly decided by the paradigms that educational institutions contribute to construct. The existence of mental models and the affiliations to professional networks, as well as secondary socialisation during higher education result in a selective perception of the reality among managers. Managers are also carriers of values and a cognitive base. The institutionalisation and creation of a common identity through education and affiliation to professional networks influence the manager's cognitive base and his or her values.

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