

Organisational Learning - The creation of ecological minds in organisations

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Abstract

This contribution draws from several research sources in order to develop an organizational learning frame of reference towards ecological implementation in business companies. 1. It will demonstrate the necessity for companies to protect their production systems from overdemands through the establishment of various legitimation functions in the company. 2. The paper will also show that rational decision making instruments (like capital investment planning) per se not adapt to ecological demands, but to the contrary hide the ecological decisions taken in the decision making process. 3. Based on these empirical case studies we therefore can develop the organizational-learning-structure for ecological learning. The learning-issue is completed with the different modes of decision making in businesses (strategic choice, optimization, competition driven). Thus, this paper aims at overcoming the many myths regarding pressures posed on companies, both from the consultant community and different green pressure groups, by demonstrating that companies reactions (even defensive) are rational from the learning perspective.

Organisational Learning and the Environment

Organisational learning perspectives

There are different positions and theoretical developments explaining learning and adaptation of organisations. These perspectives describe learning in terms of adaptation, information processing, development of theories-in-use, and the institutionalisation of experience in the organisational context: (Argyris and Schon, 1978), (Cyert and March, 1963), (March and Olsen, 1979), (Hedberg, 1981), (Shrivastava, 1983).

In his recent book Henry Mintzberg, (Mintzberg, 1994) builds a bridge between organisational learning perspectives and the development of organisational strategies. Organisation learning (OL) is critical for the formulation and evaluation of organisational strategies. For our purposes we have to ask whether specific OL-perspectives are able to enhance our understanding of the empirical phenomena we are interested in; the adaptation of ecological norms into the organisational decision-process and thus strategy.

Cyert and March, (Cyert and March, 1963) label adaptation as "organisational learning" and describe three different phases of the decision making process: adaptation of goals, adaptation in attention rules and adaptation in search rules. With regard to ecological adaptation the "goal adaptation" has to be problematic from the definition point of view. "Ecological adaptation" is per se an ambiguous, complex and vague concept. It focuses a problem, but not a goal.

Adaptation in attention refers to the selective attention that the organisations bestows on different parts of the environment. When studying "ecological demands" we have shown (Schwartz and Wolff, 1991) that organisations are both controlled by external demands, at the time they develop processes and institutions by which they are able to handle conflicting demands. In the case of Volvo Schwartz, (Schwartz, 1994) demonstrates how the company de-couples (Weick, 1979), (Wolff, 1982). the production system from these demands, by creating a legitimating function, i.e. public affairs. The public affairs function deals with the ecological demands from the outside, and by doing that enables the production system to create new modes and solutions of production. De-coupling enables selective attention and the development of new solutions.

The basic structure of the Cyert and March, (Cyert and March, 1963) perspective is external. Other theorists focus on organisations in which members have the capacity to learn to predict changes in their environments, identify the influences of these changes, search for relevant strategies, and develop appropriate structures for implementation. (Hedberg, 1981), (March and Olsen, 1979), (Wolff, 1982). With regard to ecological learning organisations have to question their assumptions of what they do, they have to unlearn and develop new views and solutions. An internal learning theory is needed to explain what is going on within the organisation, when its dominating theories-in-use are in question.

Usually an organisation responds to external signals by correcting its core theories-in-use successively. The basic assumptions of these theories are rarely questioned. The continual and concerted sharing and meshing, of individual assumptions, of individual images of self and others, of one's activities in the context of collective interaction, maintains the organisation's theories-in-use (Shivastrava, 1983:12). The construction and modification of these theories through individual and collective inquiry is what Argyris and Schön, (Argyris and Schon, 1978), label organisational learning. The point being made is that individuals are agents of organisational actions and learning. It is when a mismatch is detected in the organisation, between predictions of outcomes of action theories and actual result. A search process emerges and basic assumptions are questioned. At best, new assumptions are developed and new theories-in-use emerge.

With regard to ecological learning the question is whether there are any mismatches between predicted results and actual outcomes of organisational actions. Some preliminary research results from the oil industry indicate that at least in investment decision making, assumptions are not questioned basically, when ecological demands enter the decision arena. Rather, these demands are incorporated into a loosely organised decision making process, see Zaring, (Zaring, 1993).

The development of an organisational mind (knowledge base)

The effectiveness of organisations is a function of its long term strategic choices, choices of transformation processes, and the administrative structure which support these processes (Duncan and Weiss, 1979). Organisational choices are based on the knowledge base incorporated in the organisational mind. The organisational mind is the accumulation of the experiences and the knowledge of its individual members. Still, the organisational mind is more than the sum of its individual minds, as the "organisation" reminds us of the fact that knowledge endures despite the fact that individuals enter and leave the organisation.

Duncan and Weiss define organisational learning "as the process within the organisation by which knowledge about action-outcome relationships and the effects of the environment on these relationships is developed (1979:84). This knowledge is distributed across the organisation, is communicable to its members, has consensual validity, and is integrated into the working procedures and administrative structures of the organisation. With regard to ecological learning the threats to learning occur as a consequence of organisational ideologies, rigid structures, historical performance standards and established legitimating standards.

When confronted with environmental demands, a company has to judge whether this demand is a threat to the elements of the knowledge-base, or whether the threat can be met by its established routines. The first type of threat would require what Argyris and Schön would label "double-loop-learning", the other would be classified as "single-loop-learning" (Argyris and Schon, 1978),.

LEARNING ENVIRONMENTAL PRACTICES

Background

This case description concerns decision making in off-shore operations within an international oil company. One of the company's major businesses is the exploration and exploitation of oil and gas finds.

Oil and gas production, however, result in polluting emissions of oily waste water, drill cuttings and mud and emissions to the air emanating from the large production of energy on platforms. Operations often take place on the continental shelf within territorial waters, and are therefore sanctioned and overseen by a number of government authorities. Most activity, including that affecting the environment, is thus subject to regulation and negotiated concessions. In addition, this particular oil company sets high internal environmental standards. The corporate environmental strategy provide strategic guidance: the company's activities may involve risks to the environment but the "supreme goal" of the company is that

neither its activities or products shall lead to "injury, damage or loss". Activities are to be assessed in "accordance" with "global goals for sustainable development". The environmental strategy regulates how trade-offs between environmental concerns and cost are to be made. Procedures for implementing high level of concern for the environment are provided: the seeking of profits through continuous improvements, the pursuit of cost-effectiveness, and the assessment of environmental consequences of activities and products.

The oil company is partially vertically integrated, medium-sized in international terms, and principally concerned with the production and distribution of crude oil products. Its core operation is the production of oil. The company develops and operates off-shore production and distribution systems (refineries and other plants) as well as retail outlets for its products.

Much of the corporate activity is planned in a bottom-up fashion. This enables managers pursuing an idea to create an organisational commitment to problem definitions and solutions and hence secure acceptance for the final proposal. Significant decisions on environmental issues are said to take the form of engineering trade-offs or ad hoc decisions by operational managers.

Considering the environmental standards imposed from higher echelons and the bottom-up nature of decision-making, the case study examines a change of drilling procedures. The case study is centred on these and other factors influencing a learning process that led to a change in prescribed technical procedures.

Learning to Improve Drilling Procedures

For economic development, oil fields depends upon the use of drilling mud to stabilise and lubricate the well bores. Oil based mud is normally thought the best for deep, hot, high angle wells. Cuttings drilled with this mud are cleaned and discharged to the sea or shipped ashore for disposal. The cuttings retain small amounts of oil that remain a source of environmental contamination. The problem of minimising contamination from drilling mud are chiefly the problems of oil fields in their production phase. One alternative to oil based drilling mud is water based drilling mud, that does not carry with it the environmental problems of oil based mud.

Recognition and Diagnosis of the Problem

In the division responsible for oil production consumption of drilling mud was found to be abnormally high at some drilling sites. Drilling specialists were dispatched from the division staff functions to investigate and discovered that the use of oil based mud also caused problems for the working environment on platforms. The problem was thus recognised as a result of signal from the management control system: excessive cost. This necessitated a diagnosis of the problem where environmental problems were recognised. The major environmental problem was concerned with the working environment on platforms. It was also recognised that the use of oil-based mud was detrimental to the marine environment.

Search for a Solution

The drilling specialists that were dispatched to investigate the excessive drilling-mud consumption knew that the main solution to the problem was known as water-based mud. They thought that it could be used if the drilling routines and technology was suitably modified. Water based mud had not been the only proposed solution: support for continued use of oil based mud was strong among other drilling specialists in the oil company. The key decision-makers were the line managers responsible for the drilling undertaken on platforms, they were reluctant to try out new methods that might effect production costs and make a negative showing in the management control system. These managers could be regarded as non-experts in drilling. This resulted in a situation where line managers were unwilling to experiment and drilling specialists dead-locked in an argument over the various merits of the proposed solutions to the problem. In the view of the proponents of water based drilling mud the opposition to it was a "mythological" conventional wisdom, dating from experiences in the Mexican Gulf in the 1930s.

Design and Evaluation of an Alternative Technology

The dead-lock was eventually broken. The proponents of water-based mud were allowed, after considerable internal lobbying and debate among technical specialists, to try out their solution by the drilling manager of one platform. They managed to be given a free hand to test and develop a technique for drilling high angle wells with water based mud. The first test was carried out in a comparatively new part of the company, where line managers were perceived (by the drilling specialists) to be less conservative and less "Americanised" than elsewhere. The opposition from pro oil-based mud specialists were reduced when a recognised consultant in this field spoke out in favour of oil-based mud.

Although the ensuing tests were not all successful, new standard operating procedures were developed and changed in favour of water based mud. According to the participants in this process this could be attributed to several factors. The initial reason for this was an unexpected *cost reduction* in drilling operations: mud costs decreased by one third. This cost reduction allowed the tests to continue in the face of various technical difficulties later on in the evaluation process. These difficulties were overcome because line managers were then lured by the potential cost reductions of water-based mud technology. The tests resulted in wells - even acute angle wells - being drilled without oil based mud. The working environment of drilling crews and among sub-contractors as well as the local marine environment also benefited.

But the first experiment had created commitment in line managers, which instilled in others the confidence necessary to develop a new competence in using water based mud.

Conclusion

The internal procedures used by a company for operational decision-making can influence outcomes in unexpected directions. The management control system served both as a hindrance (initially) and as a help (in the evaluation stage) to the introduction of environmentally drilling technology. The learning process was "cued" by the control system and it enabled coalitions to be formed in favour of the new technology. The coalition formed by specialists and managers was enabled by the potential cost savings discovered, while the specialists were motivated by idealistic beliefs in their sustained effort in opposition to oil-based mud. In the choice stage in the learning process external factors were important. The possibility of getting positive press coverage and the favorable opinion of the drilling mud sub-contractor reinforced the process. In this case the operational decision-making can be viewed as a form of *adaptive rationality*, (March, 1978), where contextual as well as organisational factors are initiate and

enable the learning process, see Burgelman (Burgelman, 1988), where a new, environmentally friendly, operating procedure *emerges* from the bottom of the organisation.

DISCUSSION

Ecologically compliance in business processes and products raises totally new questions in a business organisation. From the point of learning various issues are raised:

- a. what are the driving mechanisms by which organisations unlearn old and learn new ways of solving problems ?
- b. in what ways and to what extent are old sets of problem solutions replaced or re-evaluated ?
- c. how do different levels and knowledge-areas in organisations interact in order to develop new paradigms for problem solving ?
- d. what are the rational decision models at hand to support decision making towards ecologically sounder adaptation ?

The case of water-based mud in oil production illustrates barriers against learning. The institutionalisation of certain problem solutions are decoupled from their original historical development and handled in the organisation, on the side of the proponents of the old myths, as "truths". As such truths they are imbedded both in the organisational knowledge base, as well as common praxis in the oil industry. Both processes of institutionalisation give each other mutual strength and .

In spite of the "ecological success", the technology was transformed into standard procedures, based on "known" criteria for success, i.e. cost reduction.

As has been discussed by Jönsson & Lundin, (Jönsson and Lundin, 1977), opposing myths in organisations compete with one and another. It is an outcome of successful advocating opposing technologies that may - or may not - create changes in the institutionalised parts of an organisational mind. In our case the advocates of the new technology succeeded in creating a space for experiments, which then step by step replaced the old knowledge (technology/myth) with a new one.

Ecological adaptation of business requires new holistic views. This includes also systems perspectives beyond traditional boundaries of organisations. In the same way as systems of value creation are analysed and compared in cost-benefit- terms, parallel to that an ecological perspective has to be integrated into the value-creation-process. This way the substance of the "value-added" will be transformed step by step.

From a decision making point of view research has to look at the interplay of strategic choice, rational decision models and patterns of competition in an industry. Depending on what type of company and ecological problem that are involved (contingencies), the evolution and outcome of the decision process will vary. Frequently, the values and dispositions of the decision makers will influence the decision more than optimisation models.

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