In This Issue

Mackenzie's 'Organizational Learning'

How is organizational knowledge produced? Do organizations 'learn' and how? What is organizational learning and organizational intelligence?

Professor Mackenzie presents his first article on Organizational learning, the science of an organization based on a model of a lay *scientific community* which learns through testing and re-testing social consensus on a given scientific paradigm.

Any corporation is engaged in two kinds of production: producing goods and/or services (producing 'the other') and producing itself (i.e., producing its own ability to produce, producing knowledge, 'learning'). Increasingly, the ability to 'produce itself', i.e., to maintain and expand its ability to produce, is being rewarded in a global competitive arena. Strategic flexibility, which can be interpreted as a corporate ability to continually learn and re-learn itself within its own changing environment or ecosystem, is a good example of that.

Mackenzie asks a simple question: 'What is organizational learning?' The answer is bound to be less simple, much more demanding and much less conclusive. Yet such an effort must be expended in order to grasp the changing behavior of business organizations. Modern corporations must pay attention to producing knowledge (producing 'itself') as much – if not more – as to producing its customer-directed and increasingly temporary goods and services.

What is social or *organizational memory*? How does an organization remember what is has learned? In the traditional system, such a memory was the hierarchy itself, its structure and interconnections of information flows. But what is the memory when pyramidal hierarchies crumble and a horizontal corporation emerges? Where are the orderly and structured flows of command? What is the memory now?

It is clear that organizational learning theorists have not asked the right questions. They lack firm concepts of knowledge as coordination of action, of corporate production (heteropoiesis) and self-production (autopoiesis), of systems as rule-based self-organizing and self-producing networks. Mackenzie asks the right question: 'Where is the new wine?' How long will the old wine of hierarchical organization theory be poured into the new bottles labeled 'Organizational learning'?

The key is, as Mackenzie seems to appreciate, the notion of knowledge as consensual coordination of action, not as recorded information. A new organizational learning model is a step in the right direction.

Cavaleri's 'Soft Systems'

Contemplation of human systems can be classified into five basic categories: 'hard' and 'soft' systems thinking, cybernetic, servo-mechanistic and integrative systems thinking, according to Professor Steven Cavaleri.

The 'soft' systems thinking might hold some promise for learning about how organizations learn, if they learn at all. Organizational learning, the creation, maintenance and expansion of knowledge within an organization, is a major prerequisite to competitive survival. As we understand quite clearly that individuals must learn and acquire knowledge, we often neglect to appreciate that similar imperatives exist for organizations of individuals.

Many business organizations view themselves as machines: the hard-wired hierarchical structures that are quite incapable of learning. Just because a company produces computers, like IBM, this does not imply that that company itself is a computer or behaves (or should behave) as one. That kind of 'hard' systems self-view precludes organizational learning, stifles adaptability and ultimately, like a machine, simply lets the organization wear off and come to a halt.

One does not have to be a machine in order to produce a machine. In human systems, being a machine or being like a machine can be a serious competitive disadvantage.

'Soft' systems thinking principles are offered here as a more suitable and potentially fruitful way of organizational self-view. In a hierarchical, pro-

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cedure-based, unchanging, unimaginative and non-adaptable world of assorted IBMs, the purposeful creation of shared meanings derived from the common experiences of people is replaced by an externally imposed collective 'meaning' of the artificial. Some traditional organizations do not learn – they simply perform and thus, in due time, fade away.

The true spontaneous forces that shape human systems and their learning are mostly unseen and rarely acknowledged. They do exist in the form of rules of conduct, subtle understandings, norms, myths and traditions. They are often overruled (or destroyed outright) by hard overlays of organizational charts into which social engineers attempt to squeeze the teeming humanity. Hierarchies do not learn, they just grow and grow in order to crumble under their own weight.

Recognizing, enhancing and managing organizational learning represents one of the major challenges of the 1990s. Organizational memories of vast hierarchies are being erased by the mass crumbling down. New organizational memories have to be created and they cannot rely on hierarchical crutches for support.

So, the 'soft' systems thinking should be considered as it is a precondition to organizational learning.

Zeffane's 'Computers Usage and Employees'

How does the increasing usage of computers affect employees, their job attitudes and work satisfaction? So far the linkages have been quite difficult to identify and isolate. Professor Zeffane has explored the impact of computer usage on job satisfaction of some 1300 employees of the Australian Telecommunications industry. His results support the claim that there could be a positive influence of computer usage emerging.

As with most such relationships, there is never an absolute linkage between economic or management variables: time/space/organizational context is all important. Obviously, older employees who never used computers before will not derive a great satisfaction from their forced usage; the new generations of younger employees, weaned on computer games and word-processing their school reports from the first grade, would find it discouraging and even degrading not to find latest computer technology in their workplace. Computer usage based job satisfaction does not just exist, but is emerging at a significantly accelerating rate.

Job satisfaction is undoubtedly of interest to large societal strata, ranging from managers and employees to educators and politicians. That computer technology itself is becoming one of the important factors of overall job satisfaction is of great importance. Autonomy is becoming valued; flexibility, variety and quality are being sought for values; speed, efficiency, reliability and control bring satisfaction and pride similar to that of old-fashioned craftsmen.

None of the above is now achievable without computers, the tools of modern craftsmen. The widespread implementation of computers has increased the complexity and sophistication of jobs: no longer can employees' skills be described in simple terms coinciding with specialties or job descriptions. Traditional categories of the division of labor are being fuzzified by computer usage. Instead of a mass-production based narrow specialist, a new multifunctional craftsman is emerging.

Implementing new high technologies within the framework of old support networks and infrastructures will always cause problems and difficulties. One should not rely on horses in pulling rail-based carriages and one cannot use word processors as nothing more than sophisticated typewriters. The process itself, and its supporting infrastructure, has to be redesigned: it has to fit the new technology.

One primary source of computer use *dis*satisfaction could be a habit of simple 'computerization' of traditional structures and processes, with no significant redesign of boring and routine tasks, tools or products.

Lin and Schneider's 'AI Systems in Manufacturing'

The label Artificial Intelligence (AI) is continually broadening its coverage: from mimicking the human brain and attempting to explicate human intelligence, AI is now simply making machines smarter and more useful to humans (thus making humans smarter and more useful too).

Artificial intelligence, far from original claims of being a parallel or even autonomous intelli-

gence, is now, much more modestly, becoming a supportive or complementary intelligence.

AI is not naively attempting to surface-mimic human intelligence 'beyond recognition', but is now correctly helping to strengthen and enhance human intelligence itself. Many writers are starting to subsume decision support systems, expert systems and knowledge systems under the general label of AI. This could turn out to be correct intuition: artificial intelligence is, after all, an attempt to model human decision processes.

Professors Lin and Schneider review, classify and clarify the area of applying AI models to manufacturing and production processes. They stress the modular approach of AI, avoiding predetermined, algorithmic steps, not being too shy of self-organization. They also note the decision-making (not just utility maximization) and explanatory capabilities of AI. Finally, they encourage the conversion of information into knowledge – and it is about time. The endless data processing and information management is as far from knowledge and knowledgeable coordination of action as one can get. Only knowledge spells competitiveness: plain information and data are widely accessible in modern world. Knowledge is rare.

While data and information proliferate, become voluminous and unmanageable, knowledge can never proliferate: one can never have 'too much' knowledge. Humans have difficulties coping with data and information, but never with knowledge: that is why they get a lot of data and information and very little guidance on how to coordinate action, i.e., acquire knowledge.

Lin and Schneider focus on four basic categories of manufacturing support: process control systems, real-time process diagnostics, configuring systems and scheduling systems. Major advances, models and software development directions are described.

Management philosophies that are inadequate for both knowledge and applications of AI are those that tend to separate the strategic from the tactical and operational. Perhaps the applicational imperatives of AI will instill the strategic dimension of operations in traditional separationists.

Selvarajah's 'Training Systems Effectiveness'

Strategies adopted by organizations within a given industry are influenced by the nature of the industry. Professor Selvarajah has tested that proposition through a study of 151 Australian managers' perception of training systems effectiveness in relation to types of industry. The training system in an organization is considered a strong strategic constituent.

Studies have shown that industry categories influence strategies and the structure of organizations. Organizations within a given industry tend to have similar characteristics: *structure follows strategy*.

Selvarajah shows that industry type *and* the immediate environment have some relationship to training systems effectiveness which may, in some way, determine the structure of the industry. Defense industry shows a stronger strategy-structure relationship than, for example, the computer industry.

The view that the state of the immediate environment may influence strategy rather than strategy determining structure is supported by other researchers.

Selvarajah identifies criteria of training systems effectiveness which have strong correlation to the structural variable, industry type: 1) written training department policy, 2) planning, 3) database, 4) adequate funds for training, 5) conflict monitoring, and 6) output.

The traditional method of measuring training effectiveness is by evaluating training programs after completion. Selvarajah suggests that the evaluation of a training department is equally important and that effectiveness measures will be influenced by the nature of the industry and by the influences from the environment.