

Educational Centres as Knowledge Organisations Training Future Knowledge Workers: The Role of IT

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Abstract: The main objective of this paper is to propose an IT related educational framework for centres which are responsible for future knowledge workers – primary schools, high schools, and universities. First, we analyse the latest changes in the business world due to the arrival of a new knowledge era. According to empirical and theoretical evidence, the first step necessary to succeed in knowledge management seems to be information technology (IT). After clarifying both the conceptual differences between information and knowledge, and the different knowledge types which are necessary to be managed, we analyse how IT can be a very useful tool for knowledge management in organisations. Second, we reflect upon the academic and social aims of educational centres, relating them to the inherent aims of knowledge based organisations. The goal is to try to integrate two perspectives that are not always easy to merge. As mentioned, the key point throughout this process can be IT, but it is necessary to train students of different levels in the basic skills, not only to accomplish the academic objectives, but also bearing in mind the role they are going to play in a more globally competitive environment. Finally, we consider the influence that these changes can have on educational centres, making them adapt to the environment by means of a learning attitude that allows them to become real knowledge centres. In this respect, information technology for educational management (ITEM) systems can play a vital role as catalysts for the process of change.

1. INTRODUCTION

The economy of every country is a direct reflection of its degree of business structure development. Corporations, the major employment creators, are under growing pressure from the increasingly competitive environment. Therefore, they have to continuously adapt and transform their business practices to survive. In this adaptive process, corporations are focusing their strategies more and more on the so-called intangible resources, fundamentally knowledge management and corporate learning. This trend has meant a dramatic change in traditional business management practices which were typically centred around physical assets.

This recent trend affects the training and skills that corporations now require from their present and future employees. Clerical and non-clerical workers are becoming knowledge workers and an important part of their job is to manage corporate knowledge appropriately. Consequently, educational centres of every level, as the main suppliers of qualified human resources, must rapidly adapt to the demands of the job market and give students the necessary skills to work successfully within corporations. The success of educational centres and, in many cases, their very survival, will depend on the compatibility of their students' training with the requirements of business corporations.

One key point in achieving this is the education and training given to students in information technology (IT) matters. Empirical evidence shows that the very first step necessary to succeed in knowledge management is to know and to master IT potential. Therefore it is necessary at every educational level – primary school, high school and university – to clearly identify the likely missions and functions of the respective graduates in the jobs in today's market place. Consequently, an important task for those responsible for education is to effectively plan the IT tools that students at each level must know and master.

Bearing in mind previous considerations, this paper attempts to propose an IT educational framework with the most suitable tools, objectives and training methodologies at each educational level. This framework must be adapted to the socially established general educational objectives and, at the same time, satisfy the demands of the business world in which most students will develop their professional activities in the future.

To achieve this goal it is also necessary to redefine the role of educational centres. Knowledge¹ is the most important resource that educational centres have in order to ensure that the output (students who have completed their education) are prepared for the functions that they will

¹ Not only the knowledge that they pass on to students, but, above all, the know-how to carry out the educational function in a more effective way.

perform in the future. In this process of knowledge acquisition, the centres become organisations that learn and the ITEM constitutes an important agent for learning, making a definitive contribution to defining this new role of educational centres.

The paper starts with an analysis of the latest changes in the business world due to the new knowledge era, which leads us to the conclusion that the knowledge management efforts of companies begin with the implementation of IT. Following this, we explain the role of IT in organisations whose competitive advantage is based on knowledge management using the hypertext style of organisational structure, as well as the new concept of heterarchy.

At this point, we review the social and academic aims of the educational system at the present time, which constitute the reference that must be taken into account. This is because companies' goals could cause conflict between their demands for employees' training and the socially settled objectives of the educational system. However, it is important for the growth of joint attempts to closely integrate both sides – academic and economic – to improve the general performance at all levels, including the social one. Hence, knowing the business trend – that of companies relying on better knowledge management – and a potential way of integrating it with education aims by means of IT, we propose an educational framework for IT, trying to identify the computer skills that could be included in the formative curriculum of students according to their educational level.

To be able to put this educational framework into practice it is necessary to redefine the role of the educational centres. We consider a vision based on knowledge management to be necessary, and this is acquired after a process of continuous learning about how to teach or educate in a better way. With this purpose in mind, we reflect at the end of the paper that, in order to be successful, it is necessary to know how to take advantage of the potential offered by IT, and more specifically of the diverse tools that make up ITEM. By combining qualified human resources with the use of IT, the appropriate conditions for those changes required by the future environment can be created.

2. KNOWLEDGE AND INFORMATION TECHNOLOGY

Static theories of competition, associated with neoclassical microeconomics and the “structure-conduct-performance” school of industrial economics, are being displaced by the more dynamic approaches associated with the Austrian school of economics, especially with Schumpeter's concept of competition as a process of “creative destruction” (Schumpeter, 1934). This displacement has had profound implications for strategic management

thinking and it has generated the resource-based view of the firm, which places more emphasis on the “supply-side” than the “demand side”. This new strategic view has been closely associated with recent works on organisational capabilities, such as Prahalad and Hamel’s work (1990), which argues that sustainable competitive advantage is dependent upon building and exploiting “core competences”. These are capabilities which are fundamental to a firm’s competitive advantage and which can be deployed across multiple product markets.

Indeed, competitive conditions in product markets are driven, in part, by the competitive conditions in resource markets. Thus, the speed with which positions of competitive advantage in product markets are undermined, depends upon the ability of challengers to acquire the resources needed to initiate a competitive offensive. Sustainability of competitive advantage, therefore, requires resources which are idiosyncratic (and therefore scarce), and not easily transferable or replicable. These criteria point to knowledge as the most strategically important resource which firms possess.

Many researchers have pointed out that for many firms their ability to create, share, and use knowledge will have a major impact on their future competitiveness; and some even state that the only sustainable competitive advantage in the future will be good or excellent organisational knowledge creation and good knowledge management (Toffler, 1990; Drucker, 1993; El Sawy *et al.*, 1997; Teece, 1998; Miles *et al.*, 1998). One hypothesis is that theories of organisational knowledge creation and a resource-based view can give new ideas on how to design and implant IT. Nowadays, there are two main reasons for the changing role of IT. First, there is a paradigm shift from information processing to knowledge creation. Second, the literature on knowledge management is to a large extent ignoring IT (Carlsson *et al.*, 1996).

On the other hand, from the empirical point of view, studies such as that conducted in 1997 by the Ernst & Young Center for Business Innovation, whose objective was to describe what firms are doing in order to manage knowledge and what else they think could be or should be done, show that 22% of the 431 US and European organisations studied think that restrictions over IT are a hindrance to the transfer of knowledge. Furthermore, many companies are progressing along similar lines when their knowledge management efforts start with the implementation of a technological capability, although when respondents were asked whether their organisations’ ability to compete based on knowledge depends more upon people, process or technology issues, their aggregate responses placed the emphasis heavily on people (50%), with the other two areas carrying equal secondary weight (25% each). So, there is evidence of the knowledge management efforts of companies, starting with the implementation of a

technological capability, which allows them (at least in principle) to capture and share corporate know-how. Only after this capability exists do the firms realise how vital other factors are (Ruggles, 1998).

3. INFORMATION TECHNOLOGY: A TOOL FOR KNOWLEDGE MANAGEMENT

To explain the role of information technology in organisations whose competitive advantage is based on knowledge management, we use the hypertext style of organisational structure, defined by Nonaka and Takeuchi (1995), as well as the new concept of heterarchy *versus* the classical concept of hierarchy, as defined by Hedlund (1994). The heterarchy arises from: (1) the dispersal of knowledge and strategic action initiative to “lower levels”; (2) shifting bases of leadership and composition of teams; (3) the importance of lateral internal communication and integration through shared culture; and (4) change of roles at all levels of the corporation. Therefore, a business organisation should have a nonhierarchical, self-organising structure working in tandem with its formal hierarchical structure. The most appropriate metaphor for such a structure comes from a “hypertext”, which was originally developed in computer science. A hypertext organisational structure will have three layers: the business-system layer, the project-team layer, and the knowledge-base layer.

The central layer is the “business-system” layer, in which normal, routine operations are carried out. Since a bureaucratic structure is suitable for conducting routine work efficiently, this layer is shaped like a hierarchical pyramid, that is, this layer has a strong focus on vertical communication (Nonaka & Takeuchi, 1995). The IT community knows quite well how to design and implement systems for the business-system layer, mainly from an information processing perspective. Computer-based systems such as transaction processing systems, accounting information systems, and management information systems are good examples of this type of system (Carlsson *et al.*, 1996).

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