

Knowledge and skills needed in knowledge economy

Ivana Marić, Petra Barišić, Ivana Jurjević

Faculty of Economics and Business,
University of Zagreb, J. F. Kennedy sq. 6,
10 000 Zagreb, Croatia
imaric@efzg.hr, pbarisic@efzg.hr, jurvevic.@gmail.com

Abstract. *Knowledge is a complex and multidimensional term, while knowledge management is a rather new phenomenon. Philosophy of knowledge is involved in organizations and nations, while economy and individuals are significantly determined by knowledge society. How to manage organizations through innovations and organizational knowledge in global economy with limited resources and extended competition? How to develop unique and specific skills and technologies? How to form efficient learning organizations and transform strategy into high quality results?*

IT helps to design learning organizations while the imperative for learning and constant growth is becoming the essential part of individual and organizational activities.

The process of permanent education and improvement of skills and knowledge becomes the key feature in the successful behaviour of a certain organization.

This paper examines the education potential and gives a new view on the role of future knowledge management and skills. We agree that sustainable knowledge economy is demanding. In the next decade, we will probably find the answers on following questions: What is the role of 21st century education? What specific kind of knowledge and skills will be important in 2020?

Keywords: knowledge, knowledge economy, education

1 Introduction

The world is changing daily and is increasingly becoming determined by technology and knowledge philosophy.

Knowledge is a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluation and incorporation of new experiences and information. It originates and is applied in the mind of a scholar. In organizations, it often becomes embedded not only in

documents or repositories but also in organizational routines, processes, practices and norms [1].

The question of defining knowledge and its role in forming a balanced society has occupied the minds of philosophers and theoreticians for ages.

There are many definitions of knowledge. One of them tries to define knowledge through information and data. Vance (1997) defines information as data interpreted into a meaningful framework whereas knowledge is information that has been authenticated and thought to be the truth [19].

Knowledge is the process of practical networking of information. Knowledge is a result of processing information in people's mind [2].

Probst and Geussen (1997) define knowledge as integrity of knowledge and skills applied to solve problems. It includes both theoretical knowledge and practical everyday norms and instructions for actions. Knowledge is based on data and information, but unlike them, it is always relayed to a person. Knowledge appears as individual process in specific context manifested in action [12].

2 Towards to knowledge society

The recent interest in knowledge management and knowledge management systems has been fuelled by the transition into information age and the theories of knowledge as the primary source of economic rent [1].

Knowledge management [21] is a process of identifying, capturing and leveraging the collective knowledge in an organization in order to boost its competence.

Knowledge management [1] involves distinctive but interdependent processes of knowledge creation, knowledge storage and retrieval, knowledge distribution and knowledge application. Knowledge management is not monolithic, but a dynamic and continuous organizational phenomenon.

Hackbarth (1998) finds that knowledge management is purported to increase innovation and responsiveness [7].

The knowledge remains useless if not managed and applied properly. Organizations are constantly looking for new models and techniques of successful managing within turbulent, unpredictable and highly competitive environment. Knowledge management is one of the winning strategies. The next table describes various definitions of knowledge and different implications for Knowledge Management (KM) accordingly [1, 10].

Table 1. Implications for Knowledge Management

Definition of Knowledge	Description	Implications for Knowledge Management (KM)
Knowledge vis a vis Data and Information	Data are facts, raw numbers Information is processed/ interpreted data Knowledge is personalized information	KM focuses on exposing individuals to potentially useful information and facilitating assimilation of information
State of Mind	Knowledge is the state of knowing and understating	KM focuses on exposing individuals to potentially useful information and facilitating assimilation of information
Object	Knowledge are objects to be stored and manipulated	Key KM issue is building and managing knowledge stocks
Process	Knowledge is a process of applying expertise	KM focus is knowledge flows and the process of creation, sharing, and distributing knowledge
Access to Information	Knowledge is a condition of access to information	KM focus is organized access to and retrieval of knowledge content
Capability	Knowledge is the potential to influence action	KM is about building core competencies and understanding strategic know-how

The state of knowledge [15] is related to storage and accessibility of knowledge in an organization. Šikyr, Boras and Bakić-Tomić explain HRM practices in managing knowledge workers, the concept of knowledge and its application to organization. Explicit knowledge is usually stored in the databases systems and can be accessed relatively easily. Tacit knowledge is stored only in the workers' memory and is not easily accessible. The flow of knowledge is related to creation, sharing and use of knowledge in an organization. Explicit knowledge is created, shared and used through information systems and information and communication technologies (IS/ICT). Tacit knowledge is created, shared and used through interaction and communication among workers. The application of Knowledge Management in the organization results from the business strategy whose objectives and practices are specified in both information and human resources strategy.

Information as a production factor does not have intrinsic value. Only when transformed into knowledge and applied within companies does it gain value [11].

Wilke [22, 6] talks about knowledge society or the one based on knowledge where structures and processes of material and symbolic reproduction of society are so pervaded by knowledge dependent operations that information process, symbolic analysis and system of experts get primary role.

People, their knowledge and skills, their potential and commitment, are an essential capital when building a successful organization. The dominant competitive advantages of modern society [18] are the knowledge and the skills of the workforce. Knowledge as a resource is a central part of the circle that also includes globalization, structural transformation, as well as information and communication technology. Finally, the whole process is enabled by directing global business processes and world information transparency illustrated in Figure 1 [10, 15].

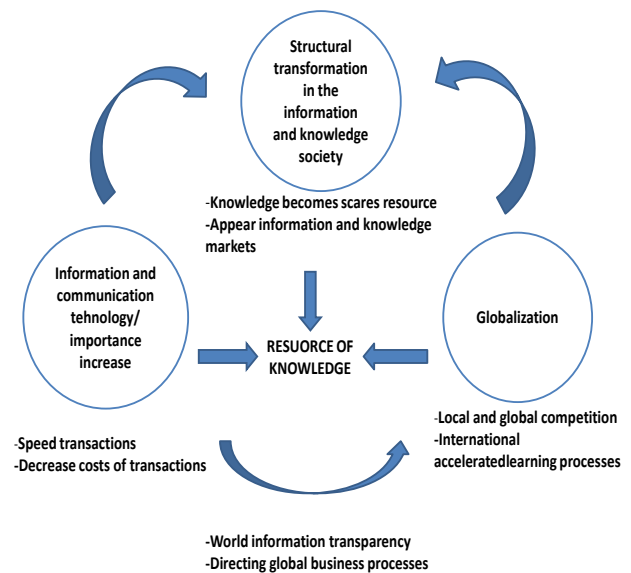


Figure 1. The role of knowledge as resource

The specific knowledge may partly be subconscious where a knowledge worker is not necessarily aware of the importance of his/her specific knowledge to the organization. The access of others to specific knowledge may be limited. They do not need to be able to learn the specific knowledge because they may be lacking their own skills, abilities, experience, interest, time, money, etc., or their access to the specific knowledge may be restricted by certain rules.

3 Knowledge workers and human capital

Knowledge is a key factor of competitive advantage of individuals, organizations and the entire economy. It is a distinctive organizational feature that distinguishes successful from unsuccessful organizations. Bahtijarević and Pološki [3] emphasize the need for learning and say that people, organizations and companies who want to succeed are forced to learn constantly and quickly, promptly receiving relevant information and knowledge.

The most valuable asset of 21st century organization, both profit and nonprofit ones, is knowledge workers and their productivity [6].

The term knowledge worker is related to human capital. Good management has the potential to transform all organizational knowledge to organizational results. Relations between human capital and knowledge workers are presented in Figure 2 [16, 38].



Figure 2. Human capital and knowledge workers

According to World Competitiveness Report among 139 countries [15], the survey that has included 13 500 business people ranked Croatia at

position 77, while overall quality of the education system put Croatia to place 89. Knowledge management in Croatia is moderate. Unfortunately, the data are very unfavorable regarding lifelong learning and further education at work, the fact that positioned Croatia at place 128.

The first significant research of practice knowledge management in large Croatian companies was conducted in 2008 by Vidović [20], and the final results showed that there existed an awareness of the need for serious approach to knowledge management. At that time the field was at an early stage of evolution. The conclusions of that research confirmed that the large Croatian companies were still in the first phase of knowledge management and that they were much better at managing explicit knowledge rather than the tacit one. There are no significant differences in the perception of employees and the actual practice of knowledge management in large Croatian companies. The development of knowledge management is not related to the company's success.

Education is the key part of progress and investing in knowledge economy, that is, a well-organized and innovative education system, is a crucial segment of the whole economic growth. The paradigm of work in the future and the concept of living is dramatically changing and undergoing transformation through the development of IT, innovations and knowledge management. Knowledge organizations will be agents of knowledge of 21st century and new skills and knowledge will be needed at the global scene.

The high cost of investment in education [4] is generally recognized in the world today. This fact is being reflected in the percentage of gross domestic product that governments allocate for formal education in their countries (typically between 5% and 6% of GDP), and substantial extra-budget funds intended for formal and informal education of company's or organization's staff and their individual training.

Education system has to take into account new trends, new needs and skills for e-generation [10] and conduct the redefinition of educational institutions. Automation, globalization, workplace change, demographic change, personal risk and responsibility are dominant forces that change skill demands these days. Skills that most employers expect to become more important in the next 5 years are: critical thinking/problem solving, IT application, teamwork/collaboration, creativity/innovation, handling diversity. Additionally, Ledward and Hirata (2011), in the context of 21st century skills, encompass 4 elements of learning and innovation skills and these are critical thinking, communications, collaboration and creativity, namely, 4Cs [9].

Knowledge as a resource needs learning organizations as formal forms and has to be structured through inspired education and new skills and competences illustrated in Figure 3.

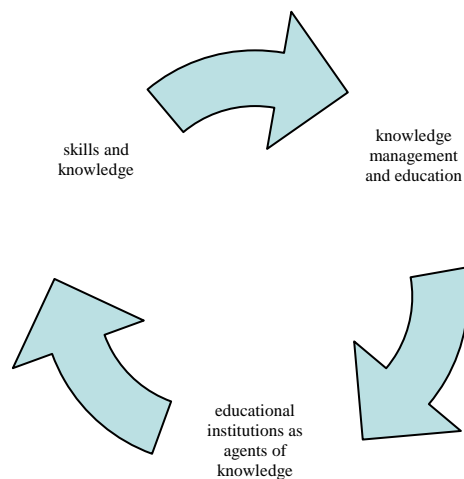


Figure 3. Process of creating skills and knowledge

There is a strong tie in the field of knowledge between the educational institutions, knowledge management and needed skills and knowledge.

21st century can be declared as ‘the knowledge era’ needing new knowledge and new skills consequently resulting in new knowledge. New business concept requires new forms of management guided by new knowledge workers.

Each organization at the global market becomes learning organization. The concept of long life learning is reforming and dramatically changing today work and life in looking for new ways of thinking and solving problems. As a result of all these changes, new occupations and jobs are becoming more relevant as the new age approaches.

New occupations with the fastest growth rate and occupations that will add the most jobs since 2006 are presented in Table 2 [5].

Table 2. Which occupations will see great growth between 2006 and 2016?

Twenty occupations with the fastest rate of growth	Twenty occupations that will add the most jobs
Network systems and data communications analysts	Registered nurses
Personal and home care aides	Retail salespersons
Home health aides	Customer service representatives
Computer software engineers, applications	Combined food preparation and serving workers
Personal financial advisors	Office clerks, general
Veterinary technologists and technicians	Personal and home care aides
Makeup artists, theatrical and performance	Home health aides
Medical assistants	Postsecondary teachers
Veterinarians	Janitors and cleaners, except maids and housekeeping cleaners
Substance abuse and behavioural disorder counsellors	Nursing aides, orderliness, and attendants
Skin care specialists	Bookkeeping, accounting, and auditing clerks

Financial analysts	Waiters and waitresses
Social and human service assistants	Child care workers
Gaming surveillance officers and gaming investigators	Executive secretaries and administrative assistants
Physical therapist assistants	Computer software engineers, applications
Pharmacy technicians	Accountants and auditors
Forensic science technicians	Landscaping and groundskeeping workers
Dental hygienists	Elementary school teachers, except special education
Mental health counselors	Receptionists and information clerks
Mental health and substance abuse social workers	Truck drivers, heavy and tractor-trailer

We can conclude that in the future the most favourable occupations will be in the field of information and communication technology, medical and home care aids, financial advising and mental care.

4 Conclusion

Today, knowledge is not just a term or a phenomenon; it is a process, an acumen and a result. It is a starting point, a final state, an input and an output, a process in itself. Knowledge is a modern religion; knowledge is changing society, organizations and economy. The concept of our work and living is significantly touched by paradigm of knowledge. Knowledge economy is constantly pushing us forward because we are involved in process of learning, communicating and transforming through new ideas, information and technology. This makes knowledge the most influential factor and a powerful tool of today.

Managers are increasingly coming to realize that the continuing education and knowledge improvement of their employees is one of the most effective ways to achieve competitive advantage. It is a basic precondition for entering the market competition and a successful struggle for the affection of consumers [13, 724].

Knowledge organizations will be agents of knowledge of the 21st century and new skills and knowledge will be needed at the global scene. Education system has to reconsider new trends and be transformed to inspire new skills and competences.

The roles of education and development in learning organizations are directed towards creating a new paradigm of learning based on innovations, changes and new technologies that modify every employee into a knowledge worker and organizations into knowledge organizations.

In conclusion, we agree with Professor Sikavica [14, 540] when he argues that the constant technological progress and innovation in all areas of human activities require that all employees must constantly be educated and trained. Finally, their

future and their survival in their organization depend on it.

References

- [1] Alavi, M., Leidner, D. E., *Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues*, 1999.
- [2] Albrecht, F., *Strategisches Management der Unternehmensressource Wissen*, Frankfurt, Lang, 1993.
- [3] Bahtijarević – Šiber, F., Pološki, N., Virtualno učenje – učinkovit i efektivan način ostvarivanja konkurentskih prednosti, *Informatologija*, Sep. Spec. (8), str. 81 – 85, 1999.
- [4] Barić, V., Obrazovna politika i čimbenici njezine učinkovitosti, *Ekonomski pregled*, br. 9/10, str. 927-945, 1998
- [5] Dohm, A., Shniper, L., *Emploment outlook: 2006-16*, Washington, DC: Bureau of Labour Statistics, pp. 95-98, 2007.
- [6] Drucker, P. F., *Management Challenges for the 21st Century*, New York, NY, HarperCollins Publishers, 1999.
- [7] Hackbarth, G., The Impact of Organizational Memory on IT Systems, *Proceedings of the Americas Congerence of AIS*, pp. 588-590, 1998.
- [8] Jerald, C. D., *Defining a 21st century education*, The Center for Public Education, 2009.
- [9] Ledward, B. C., Hirata, D., *An Overview of 21st Century Skills*, Kamehameha Schools Research & Evaluation, Honolulu, 2011.
- [10] North, K., *Upravljanje znanjem, Vođenje poduzeća usmjereno prema znanju*, Naklada Slap, Jastrebarsko, Hrvatska, 2008.
- [11] Picot, A., Reichwald, R., Wigand, R., *Die grenzenlose Unternehmung*, Weisbaden, Gabler, 1996.
- [12] Probst, G. J. B., Geussen, A., Wissensziele als neue Management-Instrumente. *Gablers Magazin*, 8, pp. 6-9, 1997.
- [13] Sikavica, P., Bahtijarević – Šiber, F., Pološki, N., *Temelji menadžmenta*, Školska knjiga, Zagreb, str. 724-72, 2008.
- [14] Sikavica, P., *Organizacija*, Školska knjiga, Zagreb, 2011.
- [15] Srića, V. *Hrvatska 2020*, Profil, Zagreb, str. 60-65, 2011.
- [16] Sundać, D., Švast, N. *Intelektualni kapital temeljni čimbenik konkurentnosti poduzeća*, Ministarstvo gospodarstva, rada i poduzetništva, 2009.
- [17] Šikýř, M., Boras, D., Bakić, Tomić, Lj., HRM practices in managing knowledge workers, *2nd Special Focus Symposium on ICESKS: Information, Communication and Economic Sciences in the Knowledge Society*, Zadar, November 13th to 14th, pp. 2008.
- [18] Thurow, L., *Changing the nature of capitalism, u: Gibson R. (ed.), Rethinking the future: rethinking business, principles, competition, control, leadership, markets and the world*, London, Nicholas Bradley Publishing, pp. 228. – 249, 1997.
- [19] Vance, D. M., Information, Knowledge and Wisdom: The Epistemic Hierarchy and Computer-Based Information System, *Proceedings of the 1997 America's conference on Information System*, August, 1997.
- [20] Vidović, M. *Upravljanje znanjem u velikim hrvatskim poduzećima*, magistarski rad, Ekonomski fakultet, Zagreb, 2008.
- [21] Von Krough, G., Care in Knowledge Management Creation, *California Management Review*, 40(3), pp. 133-153, 1999.
- [22] Wilke, H., *Wissensarbeit, Organisationsetwicklung*, 16, 15-18, 1997.