Aleksandar Keseljevic[1]

CONTEMPORARY ASPECTS OF UNDERSTANDING KNOWLEDGE

In the paper, the author presents a new understanding of knowledge through hierarchical relationships between 4 knowledge dimensions. The author argues that knowledge is a set of experiences where information is classified into patterns of thought through cognitive processes. The cognitive individual can never appropriate the entire knowledge because some knowledge is increasingly spilling over to others. Different knowledge carriers enter the market where knowledge brings economic effects to its owners and becomes a capital. The author believes that cohabitation of human and social capital and its upgrade with intellectual capital enables understanding of knowledge as a capital in its full meaning. Knowledge as a capital cannot be fully understood or conceived of without a more profound grasp of freedom through which knowledge becomes a value.

Keywords: *knowledge, information, cognitive process, capital, freedom.*

JEL: *L20, A12, D80.*

Александар Кешелевіч

СУЧАСНЕ БАЧЕННЯ КОНЦЕПЦІЇ "ЗНАННЯ"

У статті представлено нове розуміння терміну "знання" через ієрархічні стосунки між 4 вимірами знання. Стверджується, що знанням є набір досвіду, де інформація підрозділяється на окремі патерни думок через когнітивні процеси. Людина, що пізнає, ніколи не зможе пізнати все, тому що знання все частіше "виливаються" на інших. Різні носії знань виходять на ринок, де знання приносить економічний ефект своїм власникам і стає капіталом. Вважається, що співіснування людського і соціального капіталу і його оновлення інтелектуальним капіталом дає можливість розуміння знання як капіталу в повному обсязі. Знання як капітал не можна повністю зрозуміти або представити без глибшого розуміння свободи, через яку знання стає цінністю.

Ключові слова: *знання, інформація, пізнавальний процес, капітал, свобода.*

Александар Кешелевич

СОВРЕМЕННОЕ ВИДЕНИЕ КОНЦЕПЦИИ "ЗНАНИЯ"

В статье представлено новое понимание термина "знания" через иерархические отношения между 4 измерениями знания. Утверждается, что знание представляет собой набор опыта, где информация подразделяется на отдельные паттерны мыслей через когнитивные процессы. Познающий человек никогда не сможет познать всё, потому что знания все чаще "выливаются" на других. Различные носители знаний выходят на рынок, где знание приносит экономический эффект своим владельцам и становится капиталом. Обосновано, что сосуществование человеческого и социального капитала и его обновления интеллектуальным капиталом дает возможность понимания знания как капитала в полном объеме. Знание как капитал не может быть полностью понято или представлено без более глубокого понимания свободы, через которую знание становится ценностью.

Ключевые слова: *знания, информация, познавательный процесс, капитал, свобода.*

1. Introduction. Fundamental shift has been occurring today from the economy based on physical resources to the one based on intangible ones. Already in the 90's

[1] Assistant Professor, Faculty of Economics, University of Ljubljana, Slovenia.

of the previous century, the value of dematerialized assets exceeded that of the materialized ones. Traditionally, the yardstick for business performance of an organization was revenues or profit; however, Fortune magazine changed the ranking criteria for its list of top 500 US companies by employing a new concept called "market value added". By this measure, traditional American companies, such as General Motors, ranked at the bottom of the list, while companies like Intel, Microsoft and others emerged at the top. Analyses showed that in these companies the market value strongly exceeded the book value, which was the result of a new value called intellectual capital. In its background arises the problem of knowledge as one of the main resources and sources of competitive advantage (Nahapiet, Ghoshal, 2000; Choo, Bontis, 2001; Edvinsson, 2002).

Knowledge is becoming today an increasingly important factor of production (Zharinova, 2010). This is not to say that traditional factors of production are vanishing; their importance is merely becoming secondary. However, knowledge is paradoxically the least understood of all productive factors since knowledge terms (e.g. knowledge economy, intellectual capital) may be subject to certain ambiguity and since individual authors mainly define knowledge from the aspect of scientific communities to which they belong.Thus, no single definition of knowledge exists today, and there are numerous theories to explain it and many classifications.

In the paper a new understanding of knowledge through 4 knowledge dimensions, which have been together only partly foreshadowed in the discussion so far, is presented (1). The system of upgrading the hierarchical relations between 4 knowledge categories will be presented in order to better capture the nature of knowledge (2).

2. Literature review. A profound understanding of knowledge requires a considerable scope, or breadth, of analysis. Knowledge appears as the subject of various studies, and one can hardly find an area where knowledge or terms and concepts closely related to it are not mentioned. This is a result of the fact, that knowledge may be subject to certain ambiguity and that individual authors mainly defined knowledge from the aspect of scientific communities to which they belong.

For example, economic scientific discipline understands knowledge in relation to human capital (Schultz, 1961; Becker, 1964; Mincer, 1958) and information (Stigler, 1961; Hirshleifer, 1973) at the level of microeconomics, while at the level of macroeconomics in relation mostly to technology factors that are in the background of the growth theory (Solow, 1956; Romer, 1994)[2]. Psychology explores internal cognitive processes through which knowledge is acquired (Rahe, 2009) and pointing out that the cognitive capacity of the human mind is relatively small compared to the scale of problems that individuals face (Neisser, 1967; Simon, 1955). Sociology points out that, due to the increasing embeddedness of the individual into the society, different knowledge processes (e.g. transfer) are becoming more sociologically contingent (Shihao et al., 2010; Tsai, Lee, 2006; Granovetter, 1985; Etzioni, 1990). Business theories point out the problem of categorization of various types of knowledge[3](Kimmerle et al., 2010; Hecker, 2012; Lam, 2000; Nonaka, Takeuchi, 1995;

[2] Such understanding of knowledge within the economic scientific community is supported by the Machlup trilogy (1980, 1982, 1984), which is considered one of the most complete classifications of knowledge in economics.

[3] The most common in the business literature are divisions into individual/social and explicit/tacit knowledge. The combination of the said pairs is also common, being present in the form of division into conscious (individual-explicit), automatic (individual-silent), objective (social-explicit), and collective knowledge (social-silent).

Nahapiet, Ghoshal, 2000)in order to generate, through knowledge management within the framework of intellectual capital theory, a better business performance (Hsu, Wang, 2012; Moon, Kym, 2006; Youndt, Snell, 2004; Cheng et al., 2010). Understanding knowledge through particular scientific communities obviously leads to only partial analyses of knowledge. For example, orthodox economic theory devotes attention only to particular knowledge dimensions (e.g., information, human capital). Any deeper study of knowledge as a cognitive process is entirely impossible, since "homo oeconomicus" with unlimited cognitive capacity simply has no cognitive characteristics.

Overview also shows that in the literature the hierarchical concepts prevail, known as the DIKW Hierarchy, the Wisdom Hierarchy, the Knowledge Hierarchy, the Information Hierarchy, and the Knowledge Pyramid. All these approaches take as their point of departure the structural and/or functional relationship between data, information, knowledge, and wisdom. For example, DIKW model points out hierarchy involving all 4 elements (Rowley, 2007; Ackoff, 1989; Adler, 1970); however not all versions reference to all 4 (earlier versions not including data, later version omitting wisdom). An approach based on hierarchical relationships between data, information and knowledge (Henry, 1974; Boulding, 1955) is also very common. Literature review indicates that there is no consensus regarding the knowledge elements used in the hierarchy (Fricke, 2008; Rowley, 2007). However, there is consensus regarding the type of relationship between them, as knowledge can be mainly depicted as a pyramid, with data and information at its base and knowledge (and wisdom) at its apex.

I believe that the main deficiency with the dominant hierarchy approach is that certain elements essential for understanding of knowledge are missing. Therefore, in our knowledge model, some new elements will be included (e.g., cognitive process, capital, values) and some will be omitted (wisdom). These knowledge dimensions have been together only partly foreshadowed in the discussion so far. Through the system of upgrading, we will show the hierarchical relationships between 4 different knowledge categories (information, cognitive process, capital, values) with the largest component at the bottom (knowledge as information) and narrowing up to the top (knowledge as a value) in order to better understand the nature of knowledge as one of the key resources and sources of competitive advantage.

3. Knowledge as information and cognitive process. Data is understood as symbols, signs, facts or observations, which are unorganized and therefore have no meaning without context and interpretation. Information is defined as organized or structured data, means relevance for a specific purpose, and is therefore useful and relevant. Synonymous understanding of knowledge and information is quite common, especially in economics, since the availability of information is important for decision-making (Ponikvar et al., 2009; Dosenovic, Tajnikar, 2008) and in establishing their equilibrium. Economics of information underscores that we shall invest into acquiring information the amount of time at which marginal utility equals marginal costs of additional knowledge thus acquired.

However, knowledge should not be equated with information, because knowledge is a set of experiences where information is classified into patterns of thought through cognitive processes. It means that knowledge, through cognitive processes,

involves a capacity to interpret information (Dosi, 1998). Understanding of cognitive process is important as knowledge cannot exist without its subject to whom the capacity of cognition is ascribed. Cognitive processes are basically related to the individual. Thinking and learning are of particular importance for understanding of knowledge as a cognitive process (Pecjak, 1975). Simon (1955; 1959) linked these two aspects with the question of "what is rational". Knowledge as a cognitive process can therefore be apprehended through the prism of rationality. Becker (1976) defines rationality as an approach wherein individual agents maximize their utility by choosing among alternatives in accordance with their preferences. Understanding of knowledge as a cognitive process can be illustrated through 2 concepts:

a) Unbounded rationality means that individuals have due to perfect information and unlimited cognitive capacity, no problems comparing and choosing among the alternatives. However, due to the immense complexity of the real world, human mind is hardly capable of performing it in a rational manner, as rational capacity is bound (Simon, 1979). Instead of maximization, Simon (1955) puts forward the process of choosing the first possibility in which the desired level of utility is exceeded, although the domain of alternatives has not been exhausted.

b) Universal rationality means that socio-cultural factors have no effect on choice and decision-making, regardless the time and space in which an individual is located. However, many authors argue that due to the increasing embeddedness of the individual into the society, cognitive processes are becoming more socially embedded. Granovetter (1985) and Sen (1977) call attention to the fact that inclusion of an individual into the society creates relations which have impact on the cognitive processes. Therefore, we may only speak of socially contingent rationality since an individual is not merely a "homo oeconomicus", but also a social being.

Arguments cited above point to the fact that human cognitive capacity is bound due to imperfect information and the limits of human mind. With individual's inclusion into the society, knowledge as a cognitive process is becoming increasingly socially contingent and progressively less individual.

4. Knowledge as capital. Knowledge obviously requires a carrier, or an agent, in which it is to a certain extent institutionalized, and by which this knowledge is used at the market and exchanged for other entitlements. Knowledge is produced to be sold, and thus it becomes a part of the market mechanism of supply and demand which defines its price. As it is ascribed certain market value knowledge can be characterize as capital, since it brings economic effects to its owners.

Primarily knowledge represents an investment into an individual who is giving up a part of his or her income during education[4], trading it for higher income in future. Neoclassical theory of human capital at the end of 1950s gave new importance to the investment aspect of knowledge, and the value of knowledge as human capital was defined for the first time. Individuals in case of strictly defined ownership rights appropriate the majority of the benefit derived from the investment into knowledge. Human capital theory underlines that knowledge is basically a personalized process

[4] Obadic and Aristovnik (2011) point out the importance of higher education system in the human capital formation. The results show that high public expenditure per student could have resulted in a higher rate of higher education school enrolment and a greater rate of labor force with a higher education.

related mostly to the individual. However, the individual can never appropriate the entire knowledge because some is necessarily dispersed and not given completely to anyone. Through relations knowledge is increasingly spilling over to other users of knowledge, since it is often materialized in machinery, technology and teamwork. In organizations knowledge often becomes embedded not only in documents and repositories but also in organizational routines, practices and norms. As a result, organizations can be also an important carrier of knowledge, besides individuals. Contemporary organizations are realizing that organizational knowledge is an important factor of business performance and competitiveness in the market, and consequently devote increasingly more attention to systematic management of recognized knowledge at the organizational level.

Knowledge management must ensure that various types of knowledge are translated into entrepreneurial action, with the maximum possible permanent effect. Especially important is the identification, categorization and exploitation of various types of knowledge in order to generate through knowledge management a better business performance. Knowledge has been usually defined through particular pairs that express the opposite poles of the methods of acquiring, creating, and transferring knowledge. Through more efficient management and use, knowledge management is also becoming a tool for boosting intellectual capital. The soundness of upgrading our understanding of knowledge in terms of human capital with intellectual capital through knowledge management is further corroborated by the fact that most definitions of intellectual capital also emphasize the importance of social capital. Roos et al. (1997) divide intellectual capital into human, organizational, and relational-consumer capital. Onge (1996) proposes a classification into human, consumer, and structural capital. Edvinsson (2002) and Edvinsson and Malone (1997) divide intellectual capital into human and structural capitals. Highlighting relational capital (Roos) and structural capital (Onge, Edvinson and Malone) certainly points to understanding of social capital.

From a business-economics aspect, appreciation of relations through social capital in organizations is of major importance. Firstly, emphasis on the word "capital" indicates that the value component of relations is expressed, and that this component may become through organizational knowledge an important source of competitive advantage. Secondly, failure to properly grasp the notion of social capital will prevent any adequate understanding of knowledge. Knowledge is namely not a conventional commodity, as it is never lost upon sale of purchase; each transaction only increases it, leading to increasing returns. Sawyer (1978) finds that falling returns of human capital are a result of the separation of the individual from the environment, as individual is bounded in the capacity to employ his or her knowledge efficiently. To properly understand the increasing returns of knowledge, the broader social inclusion of an individual should be grasped. It is only through relations that an individual can fully employ knowledge as human capital acquired primarily for oneself. Cohabitation of human and social capital and its upgrading with intellectual capital therefore enables understanding of knowledge as capital in its full meaning.

5. Knowledge as a value. Knowledge as intellectual capital can only be fully understood with a more profound grasp of freedom. Market valuation of knowledge as a capital is strongly related to freedom that opens up the questions of alternatives

and the utility to the user. Understanding of human and social capitals as two essential parts of intellectual, heavily depends on freedom. For a deeper illustration of the co-dependence between knowledge as intellectual capital and freedom, Berlin's (1992) idea of positive and negative freedom can be applied. The field of negative freedom is the one in which person can act without any impediments; hence, the individual is free insofar as no other individual or institution restricts his actions. Positive freedom involves the issue of control over an individual; hence, it is employed by the proponents of stronger government. Negative freedom requires a certain absence of restrictions, while positive requires their presence.

At an organizational level, negative freedom is related to the understanding of formation of human capital through entrepreneurial creativity and education; positive freedom, on the other hand, is associated with the quality of organizational environment (social capital) in which knowledge is socially contingent. Freedom is important for entrepreneurial spirit and creativity of individuals. Conditions should be established that are conducive to their development, as creative individuals will only be able to reach their full knowledge potential (human capital) in a free environment. However, individual's freedom is bounded by organizational routines and norms. The more an individual is integrated into an organization, the stronger influence will be on his knowledge processes (e.g., transfer). Thus, we are moving from the field of negative freedom into the field of positive one. On one side (negative) freedom is leading to higher creativity at the entrepreneurial level forming human capital and on the other side (positive) freedom is associated with the quality of organizational environment in which knowledge processes are embedded. Obviously, knowledge as capital cannot be fully understood without freedom through which knowledge becomes a value.

6. Conclusion. I believe that we need new "lenses" to better capture the importance of knowledge as one of the key resources and sources of competitive advantage. Literature review indicates that particular scientific communities only devote attention to particular knowledge dimensions which have been together only partly foreshadowed in the discussion so far. I firmly believe that the main deficiency with the dominant approach is that certain knowledge elements essential for an understanding of knowledge are missing.

Our understanding of knowledge is based on the system of upgrading between 4 knowledge categories with the largest component on the bottom (knowledge as information) and narrowing up (knowledge as a value) at the top. Knowledge should not be solely equated with information produced by rational combination of data, because knowledge is a set of experiences where information is classified into patterns of thought through cognitive processes. Knowledge cannot be comprehended without a deeper understanding of cognitive process as knowledge cannot exist without its subject to whom the capacity of cognition is ascribed. Individuals are the main carriers of knowledge since cognitive processes are basically related to the individual.

Individual knowledge carriers enter the market where knowledge becomes capital; thus it brings economic effects to its owners. In case of strictly defined ownership rights, an individual to whom the capacity of cognition is ascribed appropriates the majority of the benefit derived from his investment into human capital. Social capital enables the individual to fully employ the knowledge acquired primarily for oneself,

and through relations knowledge is increasingly spilling over to other users of knowledge in organization. Cohabitation of human and social capital and its upgrading with intellectual capital, with knowledge management as a tool for boosting it, enables understanding of knowledge as capital in its full meaning.

Market valuation of knowledge as capital is strongly related to freedom since freedom opens up the questions of alternatives and utility to the user. The understanding of formation of human capital through entrepreneurial creativity and education can be fully understood only by a profound grasp of (negative) freedom. On the other side, positive freedom is associated with the quality of organizational environment in which knowledge is embedded. Knowledge as capital simply cannot be fully understood or conceived of without a more profound grasp of freedom through which knowledge becomes a value.

References:

Ackoff, R. (1989). From Data to Wisdom. Journal of Applied Systems Analysis, 16: 3-9.

Becker, T.G. (1961). The Economic Approach to Human Behaviour. Chicago: Chicago University Press.

Berlin, I. (1992). Dva koncepta svobode. In Zbornik sodobni liberalizem: 69-90. Ljubljana: Krt.

Boulding, K. (1955). Notes on the Information Concept. Exploration. 6: 103-112.

Choo, C.W., Bontis, N. (2002). The strategic management of intellectual capital and organisational knowledge. Oxford University Press: New York.

Dosi, G. (1998). The Contribution of Economic Theory to the Understanding of a Knowledge Based Economy. In: Neef D. (Eds). The Economic Impact of Knowledge: 123-129. Boston: Buttenworth Heinemann.

Dosenovic, B.P., Tajnikar, M. (2008). Value added of health economics for health personnel. Med. glas. Ljek. KomoreZenicko-doboj. Kantona, 5(1): 65-72.

Edvinsson, L., Malone, M. (1997). Intellectual capital. New York: Harper Business.

Edvinsson, L. (2002). Corporate Longitude. Stockholm: Bookhouse.

Etzioni, A. (1990). The Moral Dimension: Towards a New Economics. New York: The Free Press.

Fricke, M. (2008). The Knowledge Pyramid: A Critique of the DIKW Hierarchy. Journal of Information Science, 35(2): 131-142.

Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. American Journal of Sociology. 91: 481-510.

Hecker, A. (2012). Knowledge Beyond the Individual? Making Sense of a Notion of Collective Knowledge in Organization. Organization Science, 33: 423-445.

Henry, N.L. (1974). Knowledge management: A new concern for public administration. Public Administration Review, 34(3): 189-196.

Hirshleifer, J. (1973). Where are We in the Theory of Information. The American Economic Review, 63(2): 1-39.

Hsu, L.C., Wang, C.H. (2012). Clarifying the Effect of Intellectual capital on Performance: The Mediating Role of Dynamic Capability. British Journal of Management, 23(2),179-205.

Jones, P., Jordan, J. (1997). Assesing Your Company's Knowledge Management Style. Longe Range Planning, 30: 392-398.

Kimmerle, J., Cress, U., Held, C. (2010). The interplay between individual and collective knowledge: Technologies for organisational learning and knowledge building. Knowledge Mangement Research and Practice, 8: 33-44

Kuhn, T. (1998). Struktura znanstvenih revolucij. Ljubljana: Krtina.

Lam, A. (2000). Tacit Knowledge, Organizational Learning and Societal Institutions: An Integrated Framework. Organization Studies, 21(3): 487-513.

Cheng, M.Y., Lin, J.Y., Hsiao, T.Y., Lin, T.W. (2010). Invested resources, competitive intellectual capital and corporate performance. Journal of Intellelectual Capital, 11(4): 433-450.

Machlup, F. (1980). Knowledge: Its Creation, Distribution and Economic significance: Knowledge and Knowledge Production. Volume I. Princeton: Princeton University Press.

Machlup, F. (1982). Knowledge: Its Creation, Distribution and Economic Significance: The Branches of Learning. Volume II. Princeton: Princeton University Press.

Machlup, F. (1984). Knowledge: Its Creation, Distribution and Economic Significance: The Economics of Information and Human Capital. Volume III. Princeton: Princeton University Press.

Mincer, J. (1958). Investment in Human Capital and Personal Income Distribution. The Journal of Political Economy, 66(4): 281-302.

Moon, J.Y., Kym, G.H. (2006). A Model for the Value of Intellectual Capital, Canadian Journal of Administrative Science, 23 (3), 253-269.

Nahapiet, J., Ghoshal, S. (2000). Social Capital, Intellectual Capital and the Organizational Advantage. In: Lesser E (Eds). Knowledge and Social Capital: Foundations and Applications: 119-157. Boston: Butterworth.

Neisser, U. (1967). Cognitive psychology. New York, NY: Meredith.

Nonaka, I., Takeuchi, H. (1995). The Knowledge Creating Company. New York: Oxford University Press.

Obadic, A., Aristovnik, A. (2011). Relative efficiency of higher education in Croatia and Slovenia: an international comparison. Amfiteatru economic, 13(30): 362-376.

Onge, H.S. (1996). Tacit Knowledge, the Key to the Strategic Alignment of Intellectual Capital. Strategy review. March-April: 10-14.

Pecjak, V. (1975). Psihologija spoznavanja. Ljubljana: Drzavna zalozba Slovenija.

Ponikvar, N., Tajnikar, M., Pusnik, K. (2009). Performance ratios for managerial decision-making in a growing firm. Journal of Business Economics and Management, 10(2): 109-120.

Rahe, M. (2009). Subjectivity and cognition in knowledge management. Journal of Knowledge Management, 13 (3): 102-117.

Romer, P. (1994). The Origins of Endogenus Growth. Journal of Economic Perspectives, 8(1): 3-22.

Roos, J., Ross, G., Dragonetti, N.C., Edvinsson, L. (1997). Intellectual Capital. London: MacMillan Press.

Rowley, J. (2007). The wisdom hierarchy: representation of the DIKW hierarchy. Journal of Information Science, 33(2): 163-180.

Sawyer, D. (1978). Social Roles and Economic Firms: The Sociology of Human Capital. American Journal of Sociology, 83(5): 1259-1270.

Schultz, W.T. (1961). Investment in Human Capital. The American Economic Review, 51(1): 1-17.

Sen, A. (1977). Rational Fools: A Critique of the Behavioral Foundations of Economic Theory. Philosophy and Public Affairs. 6(4): 317-344.

Simon, A.H. (1955). A Behavioral Model of Rational Choice. Quaterly Journal of Economics. 69(1): 99-118.

Simon, A.H. (1959). Theories of Decision Making in Economics and Behavioral Science. The American Economic Review. 49(3): 253-283.

Simon, A.H. (1979). Rational Decision Making in Business Organizations. The American Economic Review. 69(4): 493-513.

Shihao, Z., Siu, F., Wang, M. (2010). Effects of social tie content on knowledge transfer. Journal of Knowledge Management, 14(3): 449-463.

Solow, M.R. (1956). A Contribution to the Theory of the Economic Growth. Quarterly Journal of Economics, 70(11): 65-94.

Stigler, G. (1961). The Economics of Information. Journal of Political Economy, 69: 213-225.

Tsai, S.D., Lee, C.F. (2006). The Problem of Embeddedness: Knowledge Transfer, Coordination and Reuse in Information Systems. Organization Studies, 27(9): 1289-1317.

Zharinova, A.G. (2010). Information, Knowledge and Creativity as Key Resources of Intellectual Capital. Actual Problems of Economics,112: 6-11.

Youndt, M., Snell, S. (2004). Intellectual Capital Profiles: An Examination of Investments and Profiles. Journal of Management Studies, 41 (2): 335-361.

Стаття надійшла до редакції 22.08.2012.