Understanding of Knowledge from Economist’s Perspective

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Author’s approach to knowledge is based on the system of upgrading between knowledge as information, cognitive process, capital and a value. Knowledge cannot exist without it’s subject to whom the capacity of cognition is ascribed. Cognitive capacity is bounded due to imperfect information and the limits of the human mind and is becoming with individual’s inclusion into the society socially contingent. Primarily knowledge represents an investment into an individual who can only through social capital fully employ the human capital acquired for oneself. Through organizational routines and practices individual knowledge is also increasingly spilling over to other users of knowledge causing organization to become an important carrier of knowledge. Organizations are therefore devoting more attention to systematic knowledge management as a tool for boosting intellectual capital which represents understanding of knowledge as capital in its full meaning. Knowledge as capital cannot be fully understood without a more profound grasp of freedom through which knowledge becomes a value.

Keywords: knowledge; information; cognition; human capital; social capital; intellectual capital; freedom
Introduction

Fundamental shift has been occurring today from the economy based on physical resources to the one based on intangible ones. Already in the nineties 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. 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 defined 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 anew understanding of knowledge through four knowledge dimensions, which have been together only partly foreshadowed in the discussion so far, is presented (1). Through the system of upgrading the hierarchical relations between four knowledge categories will be presented in order to better capture the nature of knowledge (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. Today, no single definition of knowledge exists, and there are numerous theories to explain it and many classifications. 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 appear in the background of the growth theory (Solow, 1956; Romer, 1994). 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 (Kimmerle et al., 2010; Hecker, 2012; Lam, 2000; Nonaka, Takeuchi, 1995; 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 of knowledge through particular scientific communities obviously leads to partial analyses of knowledge. For example, orthodox economic theory

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1 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.

2 Understanding of knowledge through particular scientific communities obviously leads to partial analyses of knowledge. For example, orthodox economic theory devotes attention only to particular knowledge dimensions (e.g. information, human capital). 2006; Youndt, Snell, 2004; Cheng et al., 2010). Understanding of knowledge through particular scientific communities obviously leads to partial analyses of knowledge. For example, orthodox economic theory devotes attention only to particular knowledge dimensions (e.g. information, human capital).
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Any deeper study of knowledge as a cognitive process is entirely impossible, since ‘homo economics’ with unlimited cognitive capacity simply has no cognitive characteristics.

Overview also shows that in the literature the hierarchical concept prevails, 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 four elements (Rowley, 2007; Ackoff, 1989; Adler 1970); however not all versions reference to all four (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 (Frické, 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 an 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 (e.g. 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 four 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 the competitive advantage.
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 in individual decision-making (Ponikvar et al., 2009; Došenović, 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 (Pečjak, 1975). Simon (1955; 1959) links 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 two pairs of 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, the human mind is hardly capable of performing it in a rational manner, as rational capacity is bounded (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 are having no effect on choice and decision-making, regardless of 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 an impact on the cognitive processes. Therefore, we may only speak of socially contingent rationality since an individual is not merely a 'homo economics', but also a social being.

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

**Knowledge as capital**

Knowledge obviously requires a carrier, or agent, in which it is to a certain extent institutionalized, and by which this knowledge is used in the market and exchanged for other entitlements.

Knowledge is produced to be sold in the market, 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\(^3\), trading it for higher income in the 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 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 (social capital) knowledge is increasingly spilling over to other users of knowledge, and thus it is becoming a public commodity; hence 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, organization can be also an important carrier of knowledge, besides the individual. Organizational learning, intelligent organization, organizational routines and collective brains are notions in the literature that point to a conception of the organization as an agent of knowledge. 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.

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

\(^3\) 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.
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 the 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 the knowledge as human capital acquired primarily for
oneself.

The key inadequacy of such a socio-economic approach is the
immeasurability of the knowledge externalities, which is why understanding
of knowledge in the framework of human and social capital should be
upgraded through intellectual capital and knowledge management. 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
proposes a classification into human, consumer, and structural capital.
Edvinsson (2002) and Edvinsson and Malone (1997) divide intellectual
capital into human and structural capital. Highlighting relational capital
(Roos) and structural capital (Onge, Edvinson and Malone) certainly points
to an understanding of social capital. Cohabitation of human and social
capital and its upgrading with intellectual capital therefore enables
understanding of knowledge as capital in its full meaning.
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. The understanding of human and social capital, 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 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 the organizational environment (social capital) in which knowledge is socially contingent. Freedom is important for the 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, an individual's freedom is bounded by organizational routines and norms. The more an individual is integrated into the organization, the stronger influence will be on his knowledge processes (e.g. cognitivity, 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 the organizational environment in which knowledge processes are embedded. Obviously knowledge as capital cannot be fully understood without a freedom through which knowledge becomes a value.
Conclusions

I believe that we need new lenses in order to better capture the importance of knowledge as one of the key resources and sources of the competitive advantage. Literature review indicates that particular authors 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 four knowledge categories with the largest component on the bottom (knowledge as information) and narrowing up (knowledge as a value) at the top. It can be depicted as a pyramid with knowledge as information at its base and knowledge as a value at its apex.

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. Cognitive capacity is bounded due to the limits of the human mind and because of the individual's inclusion into the society increasingly socially contingent and progressively less individual. Individuals are the main carriers of knowledge since cognitive processes are basically related to the individual.

Individual knowledge careers can through the system of property rights enter the market where knowledge becomes a capital. If knowledge is sold in the market it becomes a part of the market mechanism of supply and demand which defines its price; 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 (human capital) acquired primarily for oneself, and on the other hand through relations knowledge is increasingly spilling over to other users of knowledge in organization, and thus it is becoming a public commodity. 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 the 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


