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CONSIDERATIONS ON KNOWLEDGE CLASSIFICATION: KNOWLEDGE TYPOLOGIES

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Abstract
Today, knowledge is an integral part of all economic and social systems. Knowledge-based economy is depending on generation, sale, acquisition, storage, use and protection of knowledge because it is decisive in profit making and strategic competitiveness. Knowledge participates to a large extent in the manufacture of modern products and made up almost entirely services. Simultaneously, knowledge is a key factor of production, as they take part, along with other classical factors of production, to all phases of the modern production process. Finally, knowledge represents a finished product itself, like software, patents, quality standards, scientific studies etc.
Keywords: knowledge, knowledge based management, knowledge typologies

1. INTRODUCTION

Today, knowledge is an essential part of any developed economy. Knowledge-based economy rely heavily on economic processes relying on generation, sale, purchase, storage, use and protection of knowledge because it is decisive in profit making and strategic competitiveness.

Organizational capability to generate, aproach and use knowledge have long been both a tool to foster innovation, outsmart competition and be profitable at microeconomic level and a critical factor for economic and social development at macroeconomic level. However, fast changes in business conditions in recent years like ability to process and transmit information worldwide, escalation of competition (hypercompetiton), amplifying innovation in all its forms and increasingly decrease of operating networks of global communications costs have raised doubts on what types of knowledge are important to be adressed by management to achieve success.

As the barriers to accessing global knowledge are fading, knowledge and skills are becoming increasingly key to competitiveness, both locally and globally. Even in traditional economic sectors - agriculture and manufacturing - knowledge is more easily and quickly accessible globally, and thus their value is increased competitive.

So, currently economic landscape experience several transformation related to knowledge:

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a) Knowledge becomes the focus of the purchase, sale and production processes. This becomes evident when we have in mind the annual amount spent on marketing, amount of R&D expenses globally etc.

b) Knowledge assets have become more important than financial or material and technical assets. Many types of companies - advertising agencies, consulting firms, design centers, tourist agencies, IT companies etc. possess very few physical assets, but their value come from their brands and knowledge bases they developed.

c) Capitalization of knowledge and intellectual capital requires a new terminology, new methods and management techniques, new technologies, and - not least - new strategies. Most current managerial approaches are based (Drucker) on a business model centered on natural resources, which has become irrelevant.

2. KNOWLEDGE DEFINITION AND CHARACTERISTICS

Classic view address knowledge as more complex than data and information. In this respect, it is necessary to make clear the main differences between data, information and knowledge.

Stewart (Ceptureanu&Ceptureanu, 2015) argues that contrary to information knowledge is always generating added value and economic substance. Simulteneously, knowledge implies a temporal progress, typically having a lifespan longer than the information, and embedded intelligence.

For Coincross (Coincross, 1997) spatial proximity is crucial in knowledge use while for both Boisot (1998) and van den Berg (2013) the shape of knowledge assets is important, affecting its cost, potential benefits and possibilities for imitation.

Knowledge is information with added value, constituting facts or experiences known by a person or group of persons; understanding gained (earned) through experience and learning. For Sveiby (Sveiby, 2000), knowledge characteristics includes tacitness, action oriented, supported by rules and constantly changing.

According to Nonaka and Takeuchi knowledge is created by people and their interactions, is very perishable becoming obsolete fast, and is guiding any organization to do the right things for it and for society (Nonaka & Takeuchi, 1995).

Knowledge has two major concepts associated: strictness and absorptive capacity. Strictness refers to the possibility and the ability to transform knowledge into an explicit, transferable information. There are

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people and organizations that have this capability at a high level and others who, while possessing similar knowledge, fail in a less sensitive measure to raise the posts transferable (Handy,1999).

Absorptive capacity designates the ease with which the receiver perceives knowledge, understand and retain it (Cohen & Levinthal, 1990).

3. KNOWLEDGE TYPOLOGY

Most scholars recognize knowledge as having various forms. In the literature there are several knowledge classifications, some general, others specific, focused on further dividing certain general types of knowledge. We believe that putting them together is useful for all those interested in this topic, as long as knowledge based economy, knowledge based management or management of intellectual assets has to done, ultimately, with knowledge.

A. General classifications

According to content, there are the following types of knowledge:

a. Explicit/tangible knowledge is that form of knowledge that made availabe for actual or potential users by using a common system of symbols (Nonaka and Takeuchi, 1995). Wiig (1997) considers it as being describable and tangible.

b. Tacit knowledge (Nonaka and Takeuchi, 1995) is that form of knowledge that people possess in their minds, consisting of sets of past personal experiences.

c. Implicit knowledge (Polanyi, 1966) is the knowledge that is largely procedural and not dependent on an individual's context.

d. Background knowledge (Morgan, 1986), related to organisational culture and transmited within organization through oral socialization. It relates to the way employees understand specific events, actions or situations in a distinctive manner (Morgan, 1986).

According to purpose, there are the following types of knowledge:

a. Know-what knowledge, basically fundamental knowledge, are accumulations of stories about deeds, can be considered as a source for other types of knowledge (Ceptureanu & Ceptureanu, 2015).

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b. Know-why knowledge emerges primary from the results of fundamental scientific research. This type of knowledge has become the most common, mainly in areas of interface between sciences (Ceptureanu & Ceptureanu, 2015).

c. Know-how knowledge is related to the ability to turn knowledge learned and use it to solve organizational problems (Ceptureanu & Ceptureanu, 2015).

d. Know-who knowledge represents the synergy of know-what and know-how types of knowledge. This type of knowledge is related largely to the environment in which the organization is operating. (Ceptureanu & Ceptureanu, 2015).

A far less recognized types of knowledge are:

e. Know-when knowledge, knowledge related to the moment of doing something.

f. Know-where knowledge, related to a spatial place, a point/space to do something.

According to forms of embodiment, there are the following types of knowledge:

a. Products, meaning design and manufacturing related knowledge that make possible fabrication of a product; there is also knowledge surrounding the product, such as on how to use it, its applications etc.

b. Process, usually best practice derived knowledge coupled with experience of doing something in a non-repetitive manner.

c. People, knowledge based on learning and various knowledge activities like sharing and transfer, usually through communities of practice, ba-space etc.

According to degrees of diffusion, there are the following types of knowledge (Skyrme):

a. Personal/individual knowledge, knowledge known only the invidual who created that specific knowledge;

b. Shared knowledge, knowledge transmitted to others, often by personal interaction with the people who created that specific knowledge;

c. Proprietary knowledge, knowledge known widely within a specific group or community, but protected from transfer to others;

d. Public knowledge, knowledge available to all. It can be for free or require some form of access e.g. a subscription.

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*According to problems addressed, there are several types of knowledge (*de Jong & Ferguson-Hessler; Ertl, 2009*):*

a. Situational knowledge, which make possible identification of relevant characteristics necessary to solve a problem).

b. Conceptual knowledge is knowledge about facts, concepts et. related to a certain domain;

c. Procedural knowledge involves „actions that are valid within a domain, making possible for problem solver to make transitions from one problem state to another" (Ertl, 2009).

d. Strategic knowledge „helps individuals/organizations organize their problem solving process by directing which stages they should go through to reach solution. Whereas the previous three types address certain problems in a domain, strategic knowledge is applicable to a wider variety of problems in a certain domain" (Ertl, 2009).

According to form, there are two approaches:

1. Skyrme approach considers knowledge as:

a. Personal knowledge, or knowledge by acquaintance.

b. Propositional knowledge (descriptive or declarative knowledge) is knowledge that can be expressed in declarative or indicative statements.

c. Procedural knowledge is knowledge that can be used for something, a specific problem or action. Procedural knowledge differs from propositional knowledge in that it is generated by doing.

2. Alexander and Judy (1988) classify knowledge as:

a. Declarative knowledge, meaning factual information;

b. Procedural knowledge, a compilation of declarative knowledge into functional units;

c. Conditional knowledge, meaning understanding when and where to access certain facts or use particular procedures.

From the perspective of human being, according to Charles Despres, there are three types of knowledge,:

a. Internal knowledge, knowledge intrinsic related to an individual, represents all the accumulations of an individual during his lifetime.

b. External knowledge is detached from an individual and may be kept in a storage media as part of organizational memory.

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c. Explicit knowledge is an interface between the previous ones.

According to specificity, there are two types: general and specific.

a. General knowledge is broadly known, is publicly available and independent of particular events, rarely codified.

b. Specific knowledge is context-specific, is organizationally availabe and codified to be understood only be specific employees, people or member of a community.

*According to degree of innovation, there are three types (*Zack, 1999):

a. Core knowledge is the primary level of knowledge, required to all organizations operating in a domain or an industry. Core knowledge is both a source of competitive advantage and a prerequisite for anyone operating in that specific domain.

b. Advanced knowledge provide organization a competitive advantage, comprising specific skills that differentiate it from its competitors, either through more knowledge available than others, either by applying the same knowledge in various ways.

c. Innovative knowledge is what enables an organization to be the leader, representing a significant element of differentiation from other organizations.

B. Specific classifications

These deals with specific types of knowledge, usually being further classifications of general types of knowledge.

1. Rule-based vs. object-based explicit knowledge

Choo (1998) divides explicit knowledge into rule-based and object-based.

a. rule-based knowledge is knowledge codified into rules, specifications, standards etc. (Choo, 1998);

b. object-based knowledge is codified into objects (Choo, 1998).

2. Codified vs embedded explicit knowledge

According to various scholars, explicit knowledge has two specific forms:

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a. Codified knowledge is that knowledge that can be registered and stored without incurring losses of information (Choo, 1998).

b. Encapsulated (or embedded) knowledge is object-based explicit knowledge (Choo, 2006), where the codification takes place in the design and functionality of artefacts (Gorga, 2007).

3. Individual vs collective tacit knowledge

This further classification of tacit knowledge is based on individual skills development (Ambrosini and Bowman,2001).

a. Individual tacit knowledge. Castillo (2002) and Ambrosini and Bowman (2011) have identified three levels of individual tacit knowledge: non-transferable tacit knowledge, wise, practical knowledge and semantic tacit knowledge.

b. Collective tacit knowledge. Ambrosini (2003), Blackler (1995), Lam (2000) and Spender (1996) use the term collective knowledge to describe „the totality of knowledge, both explicit and tacit, held by members of a group, in which different individuals have different knowledge sets". Collective tacit knowledge consists of routines, formal and informal procedures, oral regulations on how to perform tasks within certain groups.

4. Internal knowledge subtypes

Internal knowledge, according to Charles Despres (2011) approach, has three forms:

a. Internal tacit knowledge, which emerger through socialization and is context specific.

b. Internal latent knowledge is a derived product of learning and is not available consciously.

c. Internal conscious knowledge is intentional and may be made explicit easily to others.

4. CONCLUSIONS

A rigorous classification of knowledge is essential for understanding the complex processes involved in building a knowledge-based company and - most important from the point of view of social practice - to generate, use and exploitation of knowledge.

Discussing this topic arose from several needs. There is an actual need for a systemic approach on knowledge, one that may be used to ensure that the investigations undertaken to develop this area of

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knowledge based management are comprehensive and systematic. There are significant different approaches of knowledge classification as to satisfy the requirements for anyone interested in this topic.

On the other hand, exactly this heterogeneous landscape of knowledge classifications are making research more difficult. Let's consider, for instance, internal and external knowledge. From organizational point of view, all employees' knowledge is internal but from individual point of view, only what that specific individual knows is internal. This can influence the way knowledge bases are created within company, how knowledge related processes – for instance knowledge repositories – are designed and monitored etc.

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