OPPORTUNITIES OF HARNESSING ORGANIZATIONAL KNOWLEDGE

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Abstract
In order for an organization to harness the most out of its knowledge fluxes, informational stocks and data bases it must focus its interest specifically in those areas. Within this paper we point out the idea that understanding knowledge types and knowledge processes may lead to great performance opportunities for the employees and for the organization. We started our debate through emphasizing the role and importance of knowledge both as a historical concept and as a modern tool for practice. Many discussions about knowledge start from their place in a certain hierarchy and continue by emphasizing in turn each of the following levels. We brought to attention some arguments in order to explain how organizations may transform gradually their databases and information stocks into competitive knowledge. Organizational knowledge has different perspectives, forms and meanings depending very much on the context. Understanding the knowledge hierarchy makes it possible to be more effective and avoid errors by knowing exactly which type of knowledge one needs to use. Further we argue that correct identification of knowledge helps to guide these effectively and therefore contributes to the successful achievement of organizational tasks. At this point we present some very meaningful metaphors of knowledge.

Key words: *data, information, knowledge, hierarchy, metaphor.*

JEL Classification: *M12, M13, M14, M19.*

I. KNOWLEDGE WITHIN THE ORGANIZATION

A defining feature of our society stems to be the growing importance awarded to knowledge. Today, knowledge is one of the most debated concepts in almost all spheres of activity for which there are many interpretations and definitions. We see that our society gradually turned into a global knowledge society (Drucker, 1992).

Over time people have studied various phenomena in different fields but essentially all research and experiments were conducted in order to enrich knowledge and based on previous knowledge. In terms of philosophy, knowledge was associated in the past with the truth, and the truth with rational judgment. Western perspective on knowledge captured the world's attention by the famous dictum of Descartes' – "Cogito, ergo sum", in which he highlighted the predominant role of reason and thought (reflection) upon perception (impression), launching the idea of duality between mind and body. Descartes introduced the concept now called Cartesian dualism which transmits that knowledge is the result of the brain processing/reasoning. Descartes stresses that we perceive the world through the sense organs but not with them and it is the mind (our judgment) that generates the knowledge (Bratianu and Bejinaru, 2016).

In contrast to this view, the Eastern perspective was built through the unity of body and mind. Nonaka and Takeuchi (1995) argued that knowledge is more than a rational mind and results from the conjunction of several factors both rational and non-rational, like experience, talent, imagination, intuition, hunches, emotions, values. Putting face to face the two perspectives we can't say for sure which is the right one but we consider the Eastern more suitable for the current context of management and economics, because as rational thinking is important for science and technology, thinking based on emotions is essential in leadership and decision-making processes (Bratianu et al., 2011).

We consider knowledge as a concept very dependent on context, a better understanding can be provided by the frame in which it locates because it is multi-faceted and has many levels of meaning. Appealing to the theory of knowledge creation, "knowledge" is a dynamic human process justifying personal beliefs as part of an aspiration to learn the "truth". Individuals need more knowledge to better understand the phenomena that occur in their environment.

II. DATA AND INFORMATION AS PREVIOUS KNOWLEDGE

Defining knowledge is relative to its evolution in time and the hierarchy it belongs today. According to the literature, we say that knowledge is at a higher level than information, data or signs and we shall use a pyramid representation to emphasize the distinction. Under this approach, we identify the signs as the basis of a pyramid as these are graphs invented by men in order to facilitate communication with peers. For example, the letters of the alphabet or numbers, which if used alone have no meaning but they make sense when used together in a certain context.

Data are groups of signs that give the expression of an event or process. For example, a daily temperature table during a certain month of the year is one set of data. Within the signs category can be included also mathematical symbols and body language signals. We emphasize that the data has no meaning but it is associated by individuals depending on the context in which they are used. In this respect, the data are aggregations of signs used to characterize events or processes (Brătianu et al., 2009). We need high quality material –*data,* in order to obtain quality *information*. Using the data we can record events that occur. Data should be collected and organized in reports. These reports contain data centralized and structured in a manner which gives certain added value and thus turns into *information*. Data are necessary to measure the turnover, costs, quantities, capacities, etc. within an organization. (Tiwana, 1999) From organizational perspective data are regarded as structured records of transactions. But without a proper interpretation of these data, they do not convey a specific meaning. For the decision process, the data has to be transformed into useful information. We see according to the authors Davenport and Prusak (2000) and Tiwana (1999) defining data as sets of objective facts about events that data staple in their purest have no relevance to the receiver. The data only partially describe what happened, but does not provide judgments or interpretations, and certainly are not the basis for action.

On the next level of the hierarchy lies *information* that includes meaning. Moreover, information is a data set that leads to a semantic distinction and this information is the raw material for the production of knowledge (Brătianu et al., 2010). Knowledge is information processed in order to better understand the phenomena that occur around us (Bratianu et al., 2009).

Information creates a context and links the data by some relationship of dependency. Such data together with meta-data and a specific context create information. However, information may only be considered information when generating the meaning. Transmission of information requires a process of communication between transmitter and receiver. In the communication process, the sender gives data a meaning and this way forms a message.

Subsequently, the receiver is the one that gets the message and classifies it, in the category of data or information. Information can flow within an organization in printed, verbal or digital form. Information may be issued by persons or computers. Storage and transmission of information depends heavily on the technology available. Davenport and Prusak (2000) showed that within the organization there may be several methods by which data is converted into information and called them "five C" (Figure 1. Methods of transforming data into information).

Methods exposed by the authors are:
- *Contextualize data:* transmitter has in mind the purpose for which the data was collected such data are used in a particular context.
- *Categorized data*: being aware of data components the transmitter is able to categorize them.
- *Calculated data*: the data collected can be used for mathematical, statistical, econometric analysis etc.
- *Corrected data*: eliminate potential errors occurring in the process of collecting data.
- *Condensed data*: bringing data in a concise, summarizing data.

Information is in turn a component of knowledge and its processing becomes very important. Theories and practices that relate to the transformation of information into knowledge are mostly targeted to outline the route for the movement and distribution of information throughout the organization leading to the omission of messages that they continuously propagated throughout the organization.

Knowledge contains a meaning and a share of information. To obtain "knowledge" we must place the information in a context of data, information and other knowledge, and to make use of our understanding and cognition. Information is created by a particular context and its significance becomes particularly relevant for context. It is difficult to precisely define the knowledge without recourse to their prior state as information.
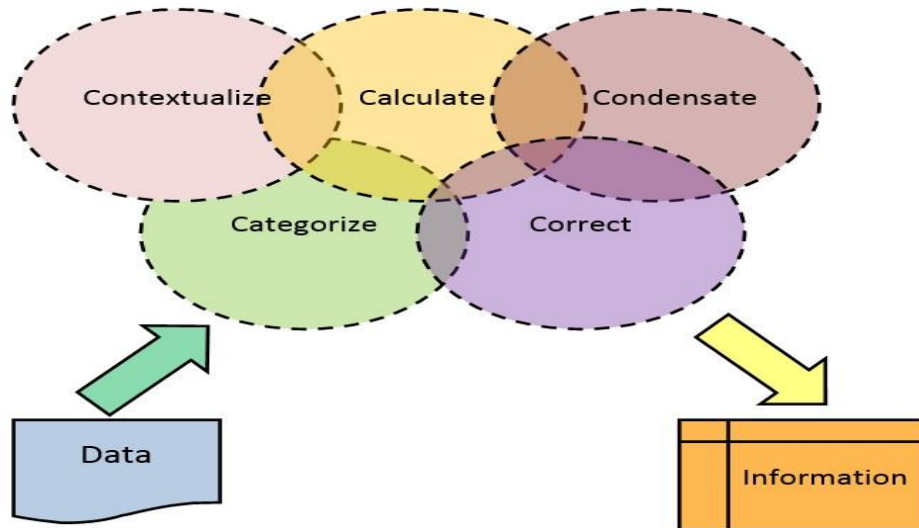
Figure 1. Methods of transforming data into information
Source: Adaptation after Tiwana (1999, p. 70)

Thus reflecting the transformation of information into knowledge, Davenport and Prusak (2000) suggest useful actions for the approach of obtaining knowledge, which we present below and take the form of interrogations:

- *Comparisons*: how to compare the information we have about the situation with other known situations?
- *Consequences*: what implications the information has on the actions and decisions taken?
- *Connections*: how to link certain information to others?
- *Conversations*: what do other people think about this information?

Knowledge is information processed in order to understand the events that occur in our environment. (Brătianu et al., 2009) We discover here the idea that knowledge is the result of intellectual activity. Knowledge is formed in the minds of individuals and in turn generates decisions, behaviors and actions. The author suggests that knowledge must be assessed in terms of the effects it produces or the results to which it drives. Actions taken on the basis of knowledge will reflect the ability to understand relationships and causality of events, and are therefore essential in improving operations, planning processes within an organization, but also forecast business results (Felin and Powell, 2016; Dima et al., 2017).
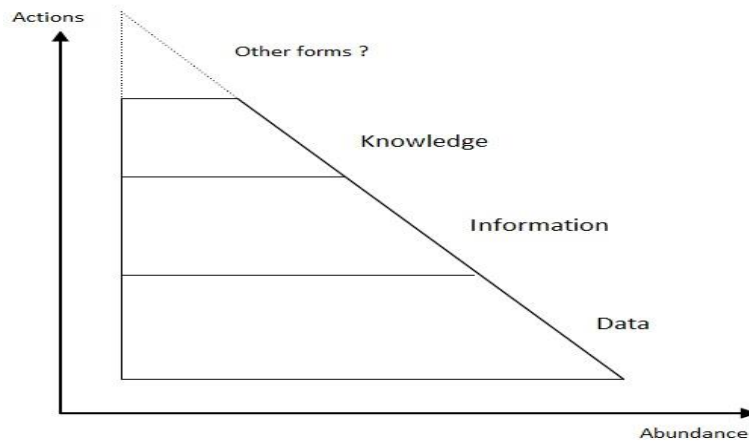
III. UNDERSTANDING THE KNOWLEDGE HIERARCHY

Clarifying the concepts of data, information and knowledge is supported by some authors through their hierarchy or as pyramidal or triangular form. Nissen (2006) succeeds to reflect mainly the distinction between the three concepts starting from their quantity in the environment and the effects that each of these produce. The author constructs a triangle which base is the axis "abundance" and which height is the focus of "actions". The message is that from the triangle's base, i.e., the abundance gradually decreases for each level of data, information and knowledge respectively. This way we identify the abundance and scarcity of knowledge. However, as we position higher in the triangle there appears above benefits regarding the results axis. Knowledge situates at the top of the triangle which means that these actions lead to progress in the organization. Managers can take excellent decisions based on complex knowledge and to a lesser extent when they have just information or data. In this context, a large amount of data has the lowest power to influence the decisions of managers compared to the abundance of information and knowledge (Argote, 2013).

Same levels have been seen by other authors (Watson, 2003) belonging to other dimensions such as the level of understanding (horizontal axis) and dependence on context (vertical axis) and the dimensions of understanding and connectivity (Bellinger et al., 2004) (Figure 2.).

Returning to the triangular form hierarchy of data, information and knowledge, we note that although within this hierarchy knowledge is positioned at the highest level comparing to data, knowledge that is not based on data is therefore incomplete. Knowledge must rely on data in order to carry on concrete action. The data is required to reduce the uncertainty as without the data, knowledge is not sufficient for the action. Clearly the

three concepts data, information and knowledge are interconnected and the complex relationships that link the three components are captured in a simple diagram.
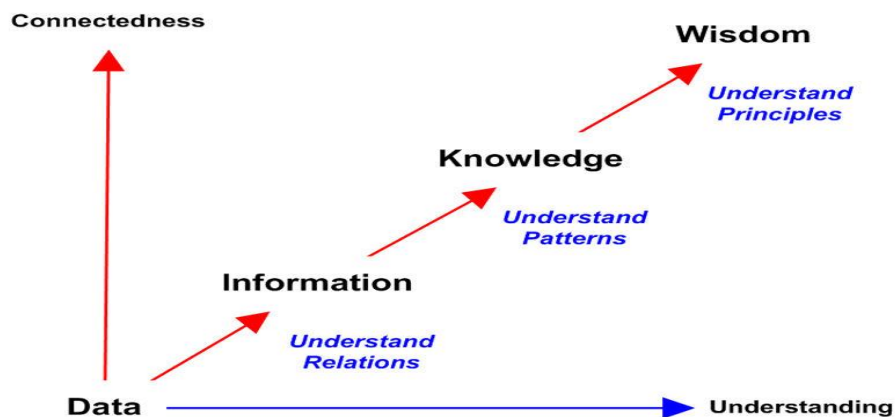
Figure 2. Hierarchy of data, information and knowledge
Source: Adaptation after Nissen (2006, p. 17)
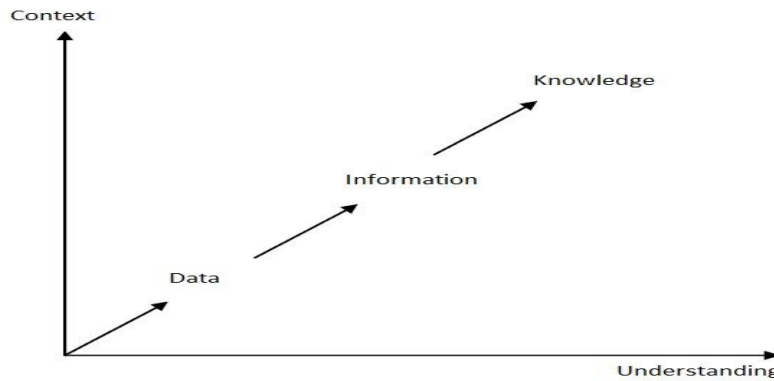
Figure 3. Representation of hierarchy of knowledge based on the level of understanding and context dependence
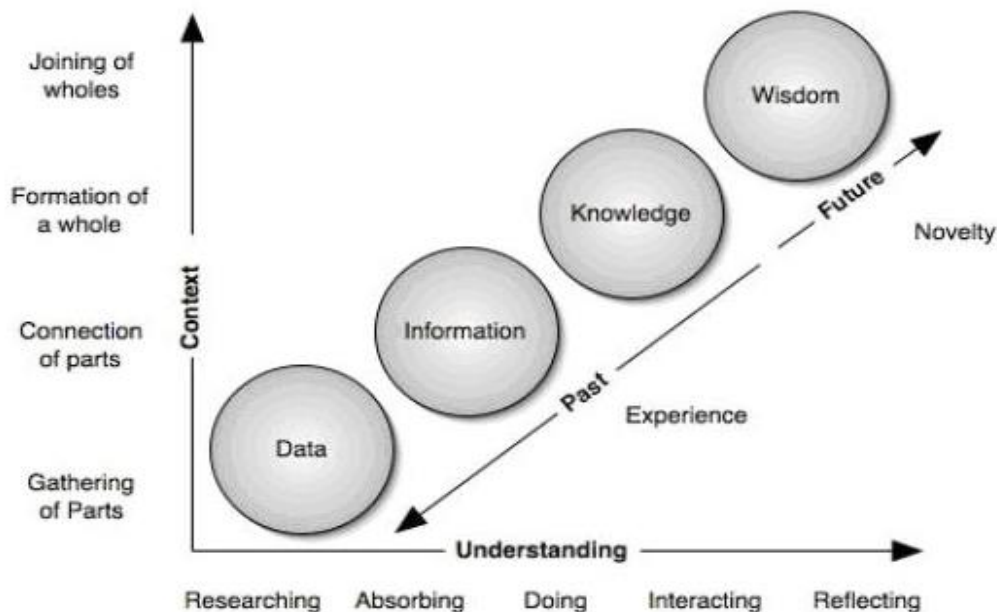*Source: Adaptation after Watson (2003, p. 7)*

Figure 4. Representation of hierarchy of knowledge based on the level of understanding and the level of connectivity
Source: (Bellinger, et. al, 2004)

The approaches of Watson (2003) (Figure 3.) and Bellinger et.al. (2004) (Figure 4.) transmit in essence the same idea that knowledge divides into the indicated categories (data, information, knowledge and wisdom) according to the individual's level of understanding still directly depending on the context they are processed in. Though the two figures seem to reflect the same idea there is a considerable difference regarding the judgment the authors stand for. In figure 4 we observe a greater accent on the dimension of –understanding. The explanation is that the progressive transition of elements from one stage to another, from data to information, from information to knowledge, from knowledge to wisdom is possible through judgment, reasoning, and understanding. (Bellinger, et.al., 2004)

The transition from the level of knowledge to the level of wisdom may be considered – applying knowledge. It is possible that in the near future some big companies to try the implementation of wisdom management as an evolution of knowledge management. Another suggestive diagram that shows the link between data-information-knowledge and wisdom is the DIKW chain or DIKW hierarchy which realization was inspired by T.S. Eliot (1934) namely through the following words: „Where is the Life we have lost in living? / Where is the wisdom we have lost in knowledge? / Where is the knowledge we have lost in information?"

Reference to this DIKW hierarchy have done few authors like Zeleny (1987) and Ackoff (1989) in their works about knowledge management, but the closest reference to T.S. Eliot's original was issued in a futurist paper of Cleveland (1982). The correct definition and categorization of knowledge allows us to concentrate our attention in order to see into depth. The first three levels of the pyramid don't create difficulties, and we refer to signs, data and information, as they are static, instead knowledge has been discovered and attributed over time a dynamic nature.

Figure 5. Hierarchy - DIKW
Source: adaptation after (Clark, 2003)

According to the mentioned authors it can be added another concept besides knowledge that would be the ultimate stage in the evolution of these concepts. It is the concept of wisdom (wisdom).

Related to the above and to the representation of Figure 5, it should be noted the following key observations made by Fleming (1996):

• A collection of data is not information.
• A collection of information is not knowledge.
• A collection of knowledge is not wisdom.
• A collection of judgments is not the truth.

The idea is that information, knowledge and judgments are more than just collections; the whole is more than the sum of their parts and has its own synergy.

Although the information requires an understanding of the relationships between data, it generally does not provide a basis for what is given and no indication of how data can change over time. The information has a tendency to be relatively static in time, as it's linear in nature. Information is a link between data and its significance depends largely on the context and with few implications for the future.

Beyond the relationship lies the model, it is more than a simple relationship between relationships. The model involves both the consistency and complementarity relations, which, in a certain measure creates its own context. The model serves as an archetype (model, standard), involving both repeatability and predictability.

When there is a model that interconnects data and information, the model has the potential to be knowledge. However, they become knowledge only when someone is able to realize and understand the patterns and their implications. Models that represent knowledge have a tendency to become more self-contextualized. That is, such a model tends to a large extent rather to create its own context than being dependent on a particular context, largely as is information. A model that is well understood may supply a high level of confidence or prediction regarding how they will evolve over time models that are less static. Models that represent knowledge are characterized by a unit (cohesion, interdependence) of their simple feature that does not possess information.

Reason (wisdom) result when one understands the fundamental principles that respond to patterns representing knowledge as what they are. And the reason, even more than knowledge, tends to create its own context. These basic principles can be referenced as generally valid truths. These fundamental principles are universal and completely dependent on context. Of course, this last statement is a kind of redundant word game: if the principle was completely dependent on context then it cannot be universally valid.

Further we briefly review the presented ideas through the following observations:
• Information refer to the description, definition and perspective (what, who, when, where).
• Knowledge includes strategies, practices, methods and approaches (how).
• Wisdom includes principles, judgments, moral or archetypes (why).

We cannot close this section without mentioning the view of the Japanese, who have a tradition in terms of how to regard and exploit knowledge. According to the Japanese perspective knowledge is not seen merely as groups of data or information that can be stored in the computer; it also means emotions, values and intuition (hunches = instinct, the 6th sense). Regarding the business approach companies not only "manage" knowledge, but also "create" knowledge and every employee in the organization is involved in creating organizational knowledge (Bejinaru, 2016; Fleming, 1996; Vatamanescu et al., 2017).

IV. KNOWLEDGE TYPOLOGY AND CHARACTERISTICS

Within an organization is of fundamental importance to have a clear perspective on the types of existing knowledge. Correct identification of knowledge according to various criteria (either by content or by origin or destination, etc.) helps to guide them effectively and therefore contributes to the successful achievement of organizational tasks. Categorization of knowledge is found in the literature based on a diverse range of criteria.

Nonaka (1994, p.17) distinguishes the following categories of knowledge: personal knowledge, public knowledge, shared knowledge and organizational knowledge. Organizational knowledge is formed based on the combination of other types of knowledge (Bratianu et a., 2011).

A clear distinction between tacit and explicit knowledge that is frequently cited in the literature of knowledge management is provided by Nonaka and Takeuchi (1995). According to Nonaka and Takeuchi (1995), explicit knowledge is that knowledge that is easily expressed received, accumulated and re-used. It can be transmitted as data and can be found in databases, books, manuals and messages. And in contrast, tacit knowledge is "very personal. Is difficult to formulate and difficult to communicate to others, tacit knowledge is generated by action / experience"(Nonaka and Takeuchi, p.8, 1995). The authors say about tacit and explicit knowledge that are mutually complementary entities. These interact with each other in the creative activities of individuals, taking successively the other form. Nonaka and Takeuchi call these interactions between the two forms of knowledge – *knowledge conversion processes.*

Expressions that have been used to refer to knowledge (Andriessen, 2007) can be classified according to their metaphorical significance and thus we infer characteristics attributed to knowledge, as the following:

    ∾   *Knowledge as a material thing.* Through this metaphor, knowledge is attributed the material form of an object or a substance. This metaphorical association is performed in order to convey knowledge more easily by using the characteristics of verbs like to store, to use, to receive, to measure, etc. There are also possible highly suggestive phrases such as *"knowledge is fluid"* (Davenport and Prusak, 2000) or *"make knowledge more fluid"* (Nonaka and Takeuchi, 1995) which are transmitting the idea that knowledge can be located, moved (knowledge such items) or can be converted and transformed. This metaphor is supported by other associations with the material world by expressions such as *"knowledge as an asset"* (Davenport and Prusak, 2000) and *"stock of knowledge"* (Nonaka and Takeuchi, 1995). Also in the same category of knowledge regarded as material is the metaphor -*knowledge as capital* that transmits the idea that knowledge is important, has value to a company and is regarded as an asset and not an expense.

    ∾   *Knowledge as waves.* Taking the characteristics of magnetic waves, electricity is used to highlight

other features of knowledge. Waves have a physical referent and they cannot be seen or touched, but can be amplified, generated, hence phrases such as "can't promote the generation of knowledge" (Davenport and Prusak, 2000) or "knowledge must first be amplified within the organization" (Nonaka and Takeuchi, 1995).

ೲ   *Knowledge like/as a living body/organism.* This metaphor illustrates the active character of knowledge in the sense of actions that lead to certain results. To highlight the characteristics of knowledge assets Davenport and Prusak (2000) used verbs such knowledge exists, grows, moves, and knowledge is working, knowledge is judging, knowledge is organizing (Nonaka and Takeuchi, 1995).

ೲ   *Knowledge like thoughts and feelings.* The intangibility characteristic of knowledge is conceptualized through comparisons with feelings, ideas, and human thoughts. The distinction between tacit and explicit knowledge is based on this metaphor, such as tacit knowledge, thoughts, feelings are by nature subjective and implicit, but can be articulated and expressed.

ೲ   *Knowledge as a process.* This metaphor highlights the dynamic nature of knowledge. Nonaka and Takeuchi (1995) used a metaphor to define knowledge "dynamic human process of justifying beliefs to the truth." As was pointed out above, knowledge leads to concrete actions, which again underlines the dynamic nature of knowledge.

ೲ   *Knowledge as a structure.* Used to highlight elements that constitute knowledge, elements that can be arranged in different ways, this metaphor is perhaps the most abstract among the metaphors found in the literature. The message of this metaphor can be drawn from the expression, "knowledge provides a framework for evaluating and incorporating new experiences and information" (Davenport and Prusak, 2000), or from Nonaka and Takeuchi's approach of regarding knowledge as a system with "cognitive elements ".

A metaphor is not only important by playing semantic similarity of two concepts but is a real tool for the creation of new cognitive approximations based on a well-known concept. It also provides insights into the new concept by emphasizing key features and omitting others (Bejinaru, 2010). Nonaka uses the meanings of "flow" and "stock" to convey his vision about knowledge and information processes. The author sees knowledge as a flow and information as a stock. We must observe the progress of metaphorical constructions from the visual and singularly level towards the movement and field elements. We find that the association of tacit knowledge considered superior abstract entities, is geared towards the fluid domain (Bratianu and Bejinaru, 2016).

V.   CONCLUSIONS

In conclusion we may say that the literature offers, at the same time, logic, philosophical and contradictory ideas about knowledge and knowledge strategies (Bejinaru and Prelipcean, 2017; Bejinaru, 2017). We observed that it is difficult to precisely define the knowledge without recourse to their prior state as information or as data. We consider the same explanation for the various types of knowledge strategies. In managers' perspective, knowledge must be assessed in terms of the effects it produces or the results to which it drives. We stress out that actions taken on the basis of knowledge reflect the ability to understand relationships and causality of events, and are therefore essential in improving operations, planning processes within an organization, but also forecast business opportunities in a turbulent environment (Bejinaru and Băeşu, 2013; Wells, 2017).

We explained the knowledge hierarchy by recurring to several meaningful diagrams and figures. We showed that data, information and knowledge (and wisdom) are undoubtedly interconnected and their progressive transition is possible through judgment, reasoning, and understanding. In order to present and unveil as much as possible about knowledge properties we presented strong metaphors like: *knowledge as a material thing, knowledge as waves, knowledge as a living body, knowledge as thoughts and feelings, knowledge as a process and knowledge as a structure.* Metaphors used in literature to describe these concepts bring us in the position to notice the potential of mental programming, how the human mind is juggling simultaneously (in parallel) with these concepts.

Organizational knowledge is obtained by integrating the individual knowledge of employees. That implies that upon the persons' knowledge elements it is developed the organizational knowledge containing new types of expression. Comprehending the nature knowledge dynamics relies upon the similitudes utilized for knowledge portrayal or metaphors (Bejinaru, 2016; 2017). Through this paper we briefly pointed some perspectives on the knowledge concept and we conclude by presuming that these discussions will increasingly evolve and deepen.

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