

## Organizational Learning, Learning Organization and IT

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### Abstract

For enhancing organizational performance, organizational learning is crucial. This research reviews several researches about the existing relationship among information technology, organizational learning and the learning organizational.

*Keywords: Organizational Learning, Learning Organization, information Technology*

### 1. Introduction

During the last years the learning is considered as an important element for the firms to achieve sustainable and competitive advantages (Senge, 2000; Schein, 1996; Stata, 1989). It can be said that the firms get a context that provides improvement and innovation which are able to respond to the changing demands of the competition world. (Murray & Donegan, 2003). Therefore, in past studies two concepts were examined which are learning organization or LO and also organizational learning or OL. They are known as complementary for each other because they have no such a distinct differentiation (Finger & Buergin, 1998; Lahteenmaki et al., 2001).

While the firms retain the located knowledge in the member's minds or may be the epistemological artifacts, this process is called OL (maps, memories, policies, strategies and programs). And also relates it to the organizational context (Argyris & Schon, 1996; Stata, 1989). In this method the knowledge is assumed as an aspect of the firm and it is considered as rules and procedures (Sicilia & Lytras, 2005). The best condition is LO that means firm for obtaining continues learning, have to evolve (Finger & Buergin, 1998) and it can be seen by changes in behavior in the firm which is the outcome of learning (Reynolds & Ablett, 1998). A more modern method would be LO but however still the most applicable concept is OL for defining the learning of organization.

Moreover, still there exist some obstacles for learning to happen and therefore limits the organizations to achieve some competitive advantages. Some of these obstacles are as follows: deficiency of communication. Conversion difficulty from the tacit into explicit knowledge and also limitation in managing knowledge (Schilling & Kluge, 2009; Riege, 2005; Von Zedtwitz, 2002).

One solution for removing and decreasing these obstacles, IT or information technology is helpful. It has some solutions like chats, emails, collaborative systems, blogs that among others could be conducted for achieving useful outcomes in the environment because they are contributing to improve people's communication and also increasing the knowledge. But, because of some problems for instance structure of proper knowledge and mechanisms that build its retrieval more convenient so defined kinds of information technology must be used therefore more high levels of intelligence is suggested for obtaining more useful outcomes. In this case, the AI or artificial intelligence area has developed study in expanding computational systems which for a defined domain provides knowledge and provides inferences, decision making and reasoning. These types of systems maintain a symbolic and explicit representation for the knowledge. This representation is useful for being divided from the aspects of procedure linked to the application and also other systems can use it.

For accomplishing this task, it is crucial to organize the knowledge formally and provide it accessible with a language that is standard therefore we can share it since computers are mainly considered as the machines which can process symbols and also requires defined instruction about how to do the manipulation of the symbols with a meaningful approach (Cimiano, 2006).

In this case, the role of ontology is important. It lets the vocabularies which are formal to define the general premise of the domain, in a more formal logic it provides an expression of shared conceptualization, it provides more convenient communication between computational agents and people, between the organizational systems it provides more interoperability and finally it can be applied by the agents of computation for acting as the human replacement in some distributing tasks or processes.

For ontology there exists a most well known definition which is: "an explicit specification of a conceptualization" (Gruber, 1995). after that Benjamins, Studer and Fensel completed it in 1998 as "ontology is a formal, explicit specification of a shared conceptualization". In 1998 Studer et

al stated that shared refers to this that we should define ontology declaratively and then to be interpreted and read by machines.

In many types and areas of application processing information by ontology is developing as a trend that gives a good context for information understanding for both software agents and human users (Musen, 2002). There exist a motivation to develop ontology that can be seen in some applications and in its usage obtained advantages.

For constructing the ontology there exists a high level of interest but however there is a limitation of developed study in this case and widely it is not used yet. In the context of organizational learning, that the application and development are mainly related the ontology was not applied very much. Some of the reasons behind this fact are resource and cost used for developing and time.

In this case, the main objective of this research is to define how in this process the ontology is being used. The following questions are not answered yet:

1. What types of ontologies are being applied in the organizational learning process?
2. What are the types of IT applied in conjunction with ontology in the context of organizational learning?
3. What are the ways ontologies and IT can facilitate the organizational learning?

## **2. Literature review**

### **2.1. Organizational learning and learning organization**

We cannot define the people only based on their skills and knowledge but their ability to manage and adopt the demanded changes by their carriers and jobs are important. The organizations have the same issue as well. For having success continually in a world which changes continually, it is important to have capability for exploring some new opportunities and understand from mistakes and goals from past (Kolb, 1973). By having a learning process it can be achieved that in it people obtain new insight and knowledge and also modifies their actions and behaviors (Stata, 1989).

What makes difference between individual and organizational learning is the fact that in OL the learning process happens by shared mental models and insights and also the learning individually is obtained by previous experience from the firm (Stata, 1989). Lyles and Fiol in 1985 empowered this difference with mentioning that the process of organizational learning affects

both direct members in the learning process individually and also will be transmit to other people by the history and rules of the organization.

These days, in the corporate world the learning is known as the vital survival pre requisite. It is important to understand the favorable situations to be used and know the process by having the aim of improving the impacts (Lahteenmaki et al., 2001). The firms require to learn to learn (Schein, 1996). Therefore, for achieving better outcomes there are two methods to be done in the process of learning: learning organization (LO) and organizational learning (OL).

But OL is not known as the holistic vision for its recognition (Lahteenmaki et al., 2001), but there is a popular assumption that OL is a changing process that is adaptive and is impacted by the past experiences which are concentrated on development or modification of the procedure and are protected by memory of organization (Nonaka& Takeuchi, 1995).Argyris and Schon (1996) mentioned that OL is a performed process by organization's members who have interaction with others or are working on their own inside the community of firm that people act on behalf of the firm. New insights are developed by members by means of debates and dialogues. These types of dialogues can be some divergences or conflicts but they will prompt the individuals to ask the available premises and to know their experience by a new approach. This interaction which is dynamic makes the personal knowledge transformation easier into an organizational knowledge (Nonaka& Takeuchi, 1995).

A perspective that is more modern is presented by LO and it was developed for characterizing the firm which makes the learning easy and lets the members to increase their ability for creating the outcomes that they desire, broad and new patterns will be developed, aspiration which is collective becomes free and members will learn to learn in a group (Pedler, Burgoyne, &Boydell, 1991; Senge, 2000; Sicilia &Lytras, 2005).

Related to these approaches there exist some confusion (Finger & Buergin, 1998; Lahteenmaki et al., 2001). The ideal is LO that the firm should use therefore they will be able to learn ongoing. On the other side, OL is known as the process and activity that by means of it the firm obtain the LO ideal. The OL might happen with no result inside the learning organization (Finger &Buergin, 1998).

Although there are some differences among the two aspects but both of them cope with learning inside the organization in which the skill of people will be improved by experience. In this aspect, the firms achieve the located knowledge in the member's minds and also in the artifacts of

epistemological (memories, maps, programs and strategies and policies). They also make it to be integrated with context of organization (Argyris&Schon, 1996; Stata, 1989).

According to Schon, Argyris and Stata it can be said that one of the objectives of OL is having knowledge as the tool for understanding the improvements and innovation. The definition of Garvin empowers this matter because he states LO is the firm which is able to create, acquire and also change the knowledge and its behavior for showing new perspectives and knowledge (Garvin, 1993).

For organizational learning having knowledge is crucial so it is better to understand the ways to be used for facilitating the knowledge acquisition procedure as well as knowledge transfer and shared understanding then the improvement and innovation might be obtained by the firm.

## **2.2. Information Technology and ontologies**

Although both organizational learning and IT have been studied for many years but only recently they have been analyzed in conjunction. The researches connect the IT importance for supporting learning process of organization (Andreu, 1996; Rech & Ras, 2008; Robey, 2000).

Generally it can be said that “applying electronic machines and also the programs for the processing, storage, transfer and presentation of information” (Björk, 1999) and can be done in many ways for protecting the OL. Some of the technologies for instance data warehouse, best practice data base, internet system and internet are crucial in order to keep memory of organization (Stein & Zwass, 1995). The support systems that operate collaboratively bring communication between the members and make it possible to retrieve and register the decisions for the future (Robey, 2000). Currently, Web 2.0 technologies for instance web blogs, wikis, folksonomies and the systems for discussion have raised with the aim to facilitate the knowledge distribution by different sources (Rech&Ras, 2008).

The modern approaches of IT state that applying a system which provides capture, retrieval and structure for information by a machine readable and structured information description for instance some ontology (Rech&Ras, 2008). For having a comprehension which is common shared the ontology will be used for the information structure between organizations and people and also they are applied with the aim of reusing of knowledge domains for providing some assumptions explicitly for the domain and separate it from the operational domain (Noy & McGuinness, 2001). In 1995 Gruber mentioned that some of the advantages achieved while the ontology is used: using knowledge for computer application, allow different computers for

knowledge sharing and assisting people for better understanding the area of knowledge and provide consensus for the area of knowledge.

Because of some reasons, ontology was applied in different areas of science related to computer as a language processing which is natural, e-commerce, knowledge management, web semantic, intelligent information integration and from others it is also useful for various communities for instance software and database engineering and also knowledge engineering (Corcho, Lopez, & Perez, 2003).

An area for application of ontology which is very considerable is computer science but however the ontology concept rose before science of computer. According to philosophy for categorizing the knowledge ontology was applied in order to defining it by help of taxonomies.

Currently, the ontology definition has been adopted and improved based on the area of application. In science of computer one of the well known definitions was provided by (Gruber, 1995) “an ontology is an explicit specification of a conceptualization”.

Based on the statement of (Borst, 1997) “ontology is a formal specification of a shared conceptualization”. According to them, Fensel and Benjamins in 1998 developed a new definition as following “ontology is a formal and explicit specification of a shared conceptualization”.

According to the definition of Studer et al 1998, “shared” refers to the fact that ontology can capture some consensual knowledge and also “formal” means that ontology must be mentioned declaratively, machine interpretable and read.

For the science of computer area the ontology definition might be also according to its structure complexity. It might define a hierarchy of concepts which are related to each other by some subsumption relations and it is closely related to taxonomies or the structure, The community of ontology provides a differentiation among ontology which are generally taxonomy, from the ones that model a domain for bringing semantic restriction. The ontology of lightweight include relations and concepts, properties of the structure. For the lightweight ontology the axioms will be added via heavyweight ontology (Corcho et al., 2003).

The structure’s difference can surpass by this and for the represented knowledge of them. While the ontology in its simplest form shows the knowledge structure so the complex ones could add the power of reasoning for the structure. The reasoning capacity permits the ontology via logical expressions to bring some new concepts based on the available ones. This will let the computer

system and its behavior not to conditionally act only for the database facts. Unlike the traditional structure for ontology data, it can explain highly complex relations between the concepts which are represented. In this complicated structure the biggest goal is knowledge capturing and using the domain model instead of providing the structure for data storage and its instances (Musen, 2002).

In the past studies the ontology is grouped based on various aspects. In 1998 Guarino divided them based on the generality level for the represented content in higher levels, application and task ontology and domain. An ontology with high level shows common sense knowledge and concepts that are independent from a private issue or domain. A vocabulary relevant to the generic domain will be developed by domain ontology. The ontology of task shows a generic activity or task as well as special concepts for ontology in high levels. The ontology as application defines the concepts and terms that are dependent to a particular task or domain and they are usually specialize or extend the task ontology of domain.

By not considering the type of ontology, the mentioned application is now a tendency in different areas and also appliances because they let the representation of knowledge by complex or simple structures, with general or special concepts. So the ontology is assumed as a vital resource to be used as facilitator or conductor in the learning process of firm. By explicit knowledge and also interference obtaining new knowledge will be possible and it can be shared in organization for getting ongoing improvement.

### **3. Conclusion**

One of the important elements for the firm is learning in order to achieve sustainable and competitive advantage during the past years. It is a fact that the organization seeks for the context that provides improvement and innovation and it is capable of react to the changes of the world in competition. Therefore, there are two discussed concepts in past studies and they are organizational learning or OL and the learning organization or the LO. These two terms are completing each other since there is no defined distinction among them.

Although the fact that organizational learning and IT are the concepts that have been studied for many years but just recently they have been analyzed in conjunction. The reviews relate the IT importance as the support in the process of organizational learning. Totally, information

technology could be described as using programs and electronic machines for the process, transfer and store and also information presentation (Björk, 1999) and might be used in different ways for protecting the OL. The technologies for instance warehouse, best practice data base and also internet systems and internet are crucial aspects for maintaining the memory of organization.

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