

## Learning, production and organizational Knowledge Transfer: Synthesis of approaches and models

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**ABSTRACT:** Knowledge is an intangible capital, which is source of creative thinking and innovation in businesses. Currently, in the business world, knowledge management plays an important role in the management scene; the enterprise's success depends on their ability to manage knowledge. Indeed, the purpose of this work is to conduct a literature review through a non-exhaustive list of the learning dynamics, production and transfer of organizational knowledge internally, through a synthesis of models and approaches of the main authors founders of theories of organizational learning, specifically we will discuss the work of Nonaka, Carlile and Szulanski.

**KEYWORDS:** Knowledge, learning, transfer borders, knowledge management, organizational learning.

### 1 INTRODUCTION

Knowledge is an intangible capital, that it becomes very important in the business world; it is a source for creative thinking and innovation. In the contemporary business world, knowledge management plays an important role in the scene of management; the business success depends on their ability to manage knowledge.

Nonaka wrote that Japanese companies owe their success to their ability to create new organizational knowledge. Japanese companies learn and manage knowledge better, they also adapt more easily, they are more innovative and they have the ability to develop specific skills, this is due to the establishment of a knowledge management system that makes them more sensitive to the market changes.

The success of Japanese companies cannot be explained only by the policy of lifetime employment, the system of promotion by seniority or any other human resources management policy "*Japanese companies have been successful thanks to their ability to develop organizational knowledge. e.g. the ability of an enterprise as a whole to create new knowledge to spread within it and to incorporate them into its products, services and systems*"(Tebourbi, 2000 [8]).

Our contribution through this work is part of our doctoral research, which aims to understand the learning process, production and transfer of organizational knowledge through the study of a non-exhaustive list of models and approaches of the main founders authors theories of organizational learning, specifically we will focus on the work of Nonaka, Carlile and Szulanski. That will let us establish a conceptual framework usable and exploitable research in future research and scientific event.

### 2 INDIVIDUAL LEARNING AND ORGANIZATIONAL LEARNING

#### 2.1 DEFINITION

One of the important issues facing businesses today is to "organize" the creation and funding of new knowledge.

Romme (1992) (cited by Szylar 2006 [1]) mentions the large number of works devoted to the "paradoxical nature" of the relationship between individual learning and organizational learning. There is a paradox, because on one hand the organization is composed of individuals, and individual learning is a necessary condition for organizational learning and also an organization may be able to learn independently of each individual, but not independently of all individuals, even when the individual is only able to learn, it is part of a larger learning system in which individual knowledge is exchanged and processed.

There is no standard definition regarding organizational learning, some convergence occurs when it is clear that organizational learning is not the sum of individual learning, but something profoundly different.

The work on organizational learning have often inspired theoretical contributions related to the study of change and adaptation processes in organizations.

According to Hubber (1991), (quoted Szylar 2006, p38 [1]), organizational learning occurs through individuals, it would be a mistake to conclude that organizational learning is nothing but the cumulative result of individual learning in based in particular on this idea, says there may be organizational learning without all the constructive parts of the organization have learned.

*"Organizational learning involves the detection and correction of errors, when the error detected and corrected, allows the organization to operate on the policies of the time to meet its present objectives, then this process error detection-correction is the single-loop learning.*

*"The double-loop learning occurs when the error is detected and corrected in a manner that causes the modification of standards, policies or goals that underlie the organization" as defined by (Argyris and Schon, 1978).*

It is logical to think that learning is organizational and is no longer individual, when discoveries, reflections and evaluations of members of the organization are "encoded" in the entire organization and at the same escape actors.

## 2.2 ORGANIZATIONAL LEARNING CYCLE

Individual interactions contribute to produce meaning and organizational knowledge. This is a different kind of individual knowledge. Thus, no actor alone holds this set of organizational knowledge, nor can reproduce, or even just restore it.

This idea also joined the work of Bechky who is also interested in the interaction between engineers and technicians in the place of production. It shows how members of these communities overcome the problems of transferring knowledge by creating a common ground.

Pedon (1997) also refers to a third learning process that qualify as call *"Deutro learning"*: "This is the final stage of organizational learning which results in the ability to change the learning rules it same, that is to say, the ability to learn how to learn". This last stage is rarely developed in the literature, that why Argyris and Schon consider that the organizations already had difficulties reaching the double loop learning.

For Hedberg (1981), *"organizations have no brain, but they have cognitive systems and memory. As individuals develop their personality, habits and beliefs over time, organizations develop a worldview and ideologies.*

*Their members come and go, and leadership style can also vary, but organizational memory preserves certain behaviors, mental reflexes, some beyond the norms and values of time passing."*

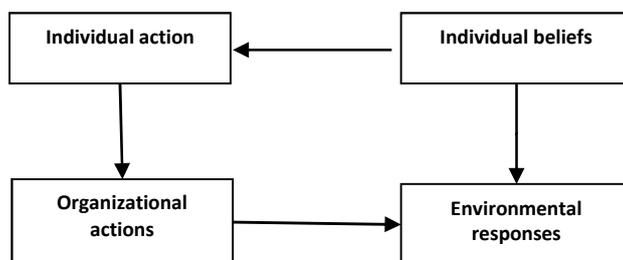


Fig1: Organizational Learning Cycle

Source : Szylar.C [1], *L'apprentissage dans les organisations*, Lavoisier, Paris, 2006, p. 219

March and Olsen describe the cycle of learning as a stimulus-response system where individual actions lead to organizational actions, which cause environmental responses. This returned to the organization and influence future actions.

**Table 1. Some definitions of organizational learning**

<b>Simon, 1969</b>	"Organizational learning includes increasing knowledge and organizational restructuring problems individuals "
<b>Koenig, 1997</b>	"Collective phenomenon acquisition and development of skills, more or less deeply and more or less permanently, change management situations themselves"
<b>Argyris et shôn, 1994</b>	"Organizational learning occurs when individuals, acting on the basis of their images and their cognitive maps, detect an achievement or a gap in expectations that confirm or refute the theories in the use of the organization"
<b>Midler n 1994</b>	"What is at stake in organizational learning, it is not private knowledge of individuals, but the collectivized knowledge they mobilize in their work in the organization, the theories in use in the words of the authors cited. it is Argyris and Shon How these theories in use -they are changing? It is the question of the programmatic course of organizational learning.

The single-loop learning and double loop

The definitions of organizational learning are now as numerous as the work devoted to it. Through all of these definitions, we can say that organizational learning is difficult to understand, it's a set of interactions that produce and develop knowledge in a collective way, and it represents a competitive advantage for business.

Argyris and Shon define single and double loop learning:

The double loop learning is the only produce long-term effects on the organization, and often develops in crisis situations.

The single-loop learning is the process where a dysfunctional found rehabilitate practices to the displayed theory, while the double-loop learning involves reflection on the standards themselves, which is, displayed on the theory. The single- loop learning is the ability to discover and correct an error with respect to a given set of operating standards:

### **3 NONAKA: ORGANIZATIONAL KNOWLEDGE CREATION PROCESS**

#### **3.1 THE FORMS OF KNOWLEDGE**

According to (Polanyi, 1966 [4]), knowledge comes in two forms:

- Tacit knowledge

Tacit knowledge is rooted in practices; built in a specific context and come from learning and experience. Referring to the definition (Reix, 1995 [7]), they are difficult to codify, formalize and standardize. They reside in the "mental structures" of individuals, and defined as opposed to explicit knowledge. This form of knowledge is impossible (or very difficult) to translate in a speech.

- Explicit knowledge

Explicit knowledge, in turn, refers to knowledge that can exist independently of the context and of the individual.

It can be expressed in a formal language, coded and stored in databases; it can be distributed without direct contact between transmitter and receiver. Books, procedures are examples of media to explicit knowledge. This form of knowledge according to Reix (1995, [7]) transmitted without loss of integrity, through a speech, once known syntactic rules of the language chosen and representation of the semantics of the language concepts.

(Nonaka, 1994 [3]) proposes a dynamic aspect of the management model of organizational knowledge creation process. Its central theme is that organizational knowledge created through continuous dialogue between tacit and explicit

knowledge. He brought a more practical extension of the Polanyi theory to which knowledge transmitted through different mechanisms (knowledge creation model). Four interaction modes involving tacit and explicit knowledge identified.

Its objective is to describe the elements of building a corporate knowledge, emphasizing the role of tacit knowledge.

Indeed, How to interact tacit and explicit knowledge to create continuous new knowledge? In addition, how to exploit the knowledge within the organization to increase its value?

**3.2 NONAKA MODEL**

Nonaka interested in social interactions between actors or groups of actors, particularly tacit and explicit dimensions of knowledge created. Four modes of interaction between tacit and explicit knowledge identified.

His model of knowledge creation in the organization based on four types of knowledge transformation that exist at the interface between tacit and explicit knowledge presented in the table below:

*Table 2. Knowledge Creation Model*

From	Tacit knowledge	Explicit knowledge
Tacit knowledge	Socialization	Externalization
Explicit knowledge	Internalization	Combination

Source: Nonaka A., *Dynamic Theory of Organizational Knowledge Creation, Organization Science Vol. 5, No. 1, February 1994.p, 19*

*Socialization* is to Nonaka converting tacit knowledge into another tacit knowledge. This process corresponds to a sharing experience and expertise within a team, for example, from non-verbal interactions that often go through observation and imitation, as part of a practice.

Interactions relate to knowledge or mental patterns, the transfer cannot be done by mere verbal or written instructions.

The exchange operates more socially because the individual gained experience through practice observing and imitating others.

*The combination* corresponds in turn, to the transformation of explicit knowledge into another explicit knowledge. This type of knowledge creation, unlike the first, involves verbalization and requires an exchange of codified and formalized knowledge.

As for socializing this transformation involves social interaction between players except the discussions pertain to formalized content, codified, which allow the use of various synchronous or asynchronous communication media (meetings, telephone conversations, emails, databases, etc.). The process of creating knowledge by the individual will be through the work of combining pieces of knowledge spread across different media.

The last two types of knowledge creation, match to the transformation of a form of knowledge to another.

To Nonaka and Takeuchi (1995), the *externalization* is the process of converting tacit knowledge into explicit knowledge. It is the cornerstone of knowledge management in companies, in that it allows to formalize (through words, images, metaphors, clichés, etc.) knowledge up 'so introverted in individuals.

While *internalization* is a process, in which tacit knowledge becomes explicit, usually through a “*routinization process*”. This is the final stage where the actor modifies his behavior and actions internalizing explicit knowledge previously acquired. At this level, the actor therefore a working knowledge selection he decides to turn into action. This work discrimination facilitated by providing the ability to use exercises, simulations, case studies, experiences and resources to connect more explicit knowledge to action.

For Nonaka, these four types of knowledge creation are complementary and necessary for the creation of new knowledge

**4 CARLILE: THE NOTION OF BOUNDARY OBJECT OR ARTEFACT**

Referring to Carlile (2004 [6]) knowledge is both a source and a barrier to creative thinking and innovation. Within teams, diversity of viewpoints allows increased ability to use information, but also slows down the problem solving. This work examines knowledge management across borders in contexts where innovation desired.

This is an important issue considering that innovation occurs mainly on the border between disciplines.

A framework developed, that describes three syntactic boundaries (no common vocabulary), semantics (lack of common knowledge) and pragmatic (practice game and influence in the production of new knowledge from practice). In addition to the transfer process, translation and transformation, the aim of the research is to understand the role actually played by these boundary objects.

How the use of boundary objects positively influence the sharing of information?

#### 4.1 THE CONCEPT OF BOUNDARY OBJECT OR ARTEFACT

The notion of boundary object (artifact) is not a concept widely used in the literature of management science, with Carlile opened a new path in his article *Transferring, Translating and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries*. The author draws on the work offers a vision of organizational knowledge.

The boundary object concept allows us to understand how we can both face the diversity of views and the development cooperation.

As defined SL Star and J. Griesemer (boundary object). They qualify as "objects that refer to several social worlds." They have the particularity to meet the information needs of each of them. Their main feature is the articulation of their "plasticity", which allows them to adapt to the needs and constraints of different stakeholders that employ them, and their "strength" to maintain a common identity between these components of the same company.

The interest of boundary objects is their ability to link different worlds without recourse to consensus, "the important boundary objects is the way practices are structured and how the vocabulary emerges to do things together" (Becker, cited in Star, 2010, p. 19). The word "object" means "something on and with which people (or, computing, software and other objects) act. Its material comes from action, not a prefabricated sense of the matter or quality of a thing. In addition, a theory can be a very powerful object" (Star, 2010). The word "border" refers to "a shared space, where exactly the sense of the here and there come together" (op. Cit., P. 20). A total of boundary objects facilitates collaboration through the flexibility and shared structure. In the article founder, Star and Griesemer (1989) describe as entities with dual ownership. Boundary objects are both plastic and sturdy. Plasticity allows them to adapt to local conditions and practices. The robustness allow them to maintain a common identity within heterogeneous communities.

In addition, boundary objects are translation means facilitating mutual understanding and cooperation, without avoiding conflict.

Flichy (1995 [5]) focuses on the notion of boundary object as part of his theory of innovation. These works include the imagination, technical and social, in the development of a technical device. These studies highlight, in the interaction between different social worlds, ambiguous objects in nature, involving both convergences and divergences.

#### 4.2 COGNITIVE BORDERS AND BORDER OBJECTS

Carlile offers a characterization of cognitive boundaries limiting the diffusion of innovations between different functions of an industrial company at three levels:

Syntactically, different groups may not share the same vocabulary. The use of technical terms, implicit references contributes to this distinction.

At the semantic level, different groups may differ on either side of a border on the meaning of the proposals, their interpretation in terms of their frames of reference;

At the pragmatic level, knowledge invested in the activities and organization of different groups. They are intrinsically, linked to the nature of the groups, their identity and organization. The consequences of the questioning of such knowledge is not the same for each group.

For Carlile, a powerful boundary object, relative to the syntactic boundaries, semantic or pragmatic present, respectively, a common syntax provides a means for individuals to account for their different frames of reference, and finally coaching along a learning process leading to advancing knowledge of both sides of the border.

## **5 SZULANSKI: TRANSFER OF 'GOOD PRACTICE'**

Transfer "good practice" represents a cost to the organization. This cost increases with the complexity of its structure. That is why we are witnessing the emergence of some research on the determinants of flows of good practice in organizations.

This study investigates the determinants transfer best practices within organizations. Szulanski explains why firms face difficulties in the internal transfer of knowledge, especially in the case of Best Practices. This study investigates the determinants transfer best practices within organizations, what are the obstacles to the transfer of best practices within the organization?

### **5.1 GOOD PRACTICE: A KNOWLEDGE "ROUTINIZATION"**

Define the concept of "good practice" is not easy because it overlaps with several realities. The "best practices" were examples of processes and behaviors that led to the successes: "Good Practices" is then to be compared with "best practices" (best practices)

A good practice defined as "an internal practice used effectively in the organization, and which proved to be far superior to other internal or alternative practices known outside the organization. Good practices are superior knowledge - performance – it's value has been proven during an apprenticeship. The main determinant for reuse becomes the absorption capacity of the receiving unit relative to the transmitter unit" (Szulanski, 1996 [2]).

This capacity reflects the ability of an enterprise to recognize, understand, and use external knowledge to apply for commercial purposes (Cohen and Levinthal, 1990)

Compensation mechanisms put in place (eg innovation contests possible to collect the different practices and reward the most usable).

### **5.2 KNOWLEDGE TRANSFER**

Referring to (Szulanski, 1996 [2]), the transfer of knowledge can be seen as an organizational practice based on common use of these resources. In multinational, transfer down (vertical, the parent company to subsidiaries) seems to be a very dominant practice.

In this context, the parent form the overall strategy, specifies the objectives and expected results from each subsidiary.

It only receives and apply global knowledge by adapting, sometimes, in the local context.

## **6 CONCLUSION**

As part of this work, we have processed the question of the dynamics of learning, production and transfer of organizational knowledge internally, through a synthesis of models and approaches of the main authors founders of theories of organizational learning.

To this end, several models and approaches have been defined explaining the importance of the creation and management of knowledge.

This research provides a conceptual model for linking the different factors that stimulate the creation of knowledge internally. This framework can be used as a tool for management researchers; it should facilitate the understanding of the process of knowledge creation in companies.

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