

# Knowledge Modeling For Strategic Innovation Management

EDSON PACHECO PALADINI  
FABRÍCIA GONÇALVES DE CARVALHO  
Production Engineer Department

Federal University of Santa Catarina, Brazil.  
Campus Universitário da Trindade - CP 476 - 88040-910 - Florianópolis – SC.  
BRAZIL

[paladini@floripa.com.br](mailto:paladini@floripa.com.br); [paladini@deps.ufsc.br](mailto:paladini@deps.ufsc.br); [fabriciagc@gmail.com](mailto:fabriciagc@gmail.com).

*Abstract:* This paper discusses how to create a knowledge modeling processes for strategic management. Innovation is the main strategy for the management approach. Basic concepts of knowledge management were used to support a proposed model that involves people in strategic decisions. The search for solutions to problems in the field of innovation management is justified by the stiff competition companies now face. In this situation, corporations need to transform their culture by giving incentives to the search for creative and innovative solutions generated by their human resources. This position is essential for organizations that attempt to create new standards of action and establish competitive distinctions.

*Key-words:* Strategic decisions; knowledge modeling; innovation management.

## 1 Introduction

The history of humanity has shown that the social evolution process involves various waves of change and it is now widely affirmed that we are in an Era of Knowledge. In this new era, in which a society based on knowledge is being consolidated, the process of innovation (the production of new knowledge that is more suitable to specific purposes) has become essential, particularly considering the competitive environment in which business organizations are now inserted.

Knowledge is now the most important factor in production, exceeding traditional resources such as labor and capital [1]. Nonaka and Takeuchi [2] maintain that in this new economy, where the only certainty is uncertainty, only knowledge can be considered a secure source of competitive and long-lasting advantages. These authors highlight the importance of generating suitable beliefs, commitments, situations and interactions so that information is converted into knowledge and can circulate through an entire organization, and positively influence judgments, behavior and attitudes.

According to Porter [3], knowledge is the economic resource most valuable to the competitiveness of companies and nations. One can observe, however, equivocal behavior of managers in efforts to adapt to new market demands, above all in terms of still unorganized processes to involve

individuals in the search, production and evaluation of knowledge.

The knowledge generated must have unequivocal value to a business organization. It must be adherent, current, useful and compatible with the daily practice of the people who compose the organization. To make viable its effective utilization, the knowledge must be retained in the organization, and shared by all those involved and stored for later applications [4].

This paper focus on knowledge modeling processes in a very specific way: as a basis to formulate strategic decisions. Innovation is the main strategy for the management structure of the organization. We use here basic concepts of knowledge management to support a general decision support model.

## 2 Theoretical Reference: Knowledge and Innovation Management

In the current economic model, people, structures and clients form the Intellectual Capital of the Organization. The management model is democratic, emphasizing abilities, initiative and creativity. The managerial process must be strategic to be able to transform a company's organizational capability in order to meet market demands [5]

The role of leadership here is evident. In the

realm of Knowledge Management, this leadership has been constantly emphasized [6], because winning organizations are those that have leaders who educate and who are prepared to extract the best from the Human Capital of the organization (knowledge and experience), in order to achieve distinct positions in the market.

The most common mechanism in this context is innovation management (constant alterations in products, methods and services) that requires an innovative vision from personnel. Terra and Gordon [7] express this situation well: "People are the DNA of an organization, while knowledge is the DNA of innovation".

As a general rule, two elements of the market function as stimuli for innovation: the growing demands of clients and the increasingly bold action of competitors. The later are of critical importance because they establish a strategic situation for organizations.

The achievement of results in a highly competitive environment requires investment in knowledge. This requires an organizational system and culture that allows the free flow of knowledge and creation. Above all, the model must be able to organize decisions that lead to actions and the evaluations that must be made.

Involved in a process of intense competition, organizations that want to succeed must create distinctions that make them references in their fields.

This effort is essential, given that it implies the very survival of the organization (and for this reason it is characterized as a strategic position).

Innovative products emerge in increasingly shorter periods. Thus, companies must always be prepared and more capable of generating and obtaining knowledge, to be able to transform products and services.

Organizations increasingly depend on information to make decisions that identify opportunities and create ways to better serve clients, by exceeding their expectations. To absorb this new work dynamic, companies undergo important transformations. Changes are accompanied by problems such as duplicated, lost, mixed or unprotected information and at times, information dependent on single sources (one person or sector) [8].

These issues represent the main concerns of managers, given that they involve the strategic positions of the organization – after all, how is it possible to compete in a globalized market without dominating one's own knowledge?

Companies affirm that the best way to beat the

competition is by supporting innovation. To continuously achieve new ideas it is necessary that employees, suppliers and clients form a single group, and undertake their actions in an organized manner. For Garcia and Calantone [9], innovation is a process of development and of generation of new products and services that are capable of obtaining commercial success. For Dosi [10], it involves the search, discovery, experimentation, development and adoption of new products or new production processes.

Innovation is a source of growth for companies. But, to find, detect and develop an idea is not easy, and finding a market is even more difficult. Innovation involves three criteria: (1) it is something new, concrete and which advances (unlike an idea); (2) it is continuously improved and (3) is realized by means of a change of paradigm [11].

Innovation is one of the principal means of achieving a competitive advantage based on market needs. To innovate is to create new products and to develop existing ones, but it is also to improve production systems by adopting the latest technologies. Gavriloff [11] also maintains that there are principally two levels of application of innovation in companies.

The first is Limited innovation – an innovation project or innovation of a product. That is: a project to improve existing products, creation or adoption of a new state of the art technology.

The second is Permanent Innovation – total innovation or innovation management. At this level, innovation must be a pillar of company strategy.

In general, companies begin with innovation of a project to develop a new product or service.

To do so, it is necessary to establish criteria that classify the different types of innovative products to assist management to plan and organize projects individually, considering the needs of each one.

The development of products takes place when the organization transforms the market data and technical possibilities into goods and information for the manufacture of a product to be placed in the market [12]. The coordination and management of product development includes various tools, technologies and fields of knowledge. Clark and Wheelwright [13] present a useful and easy-to-understand model of product development.

The elements that compose the model:

- a. *Definition of the Project*: this is the element responsible for establishing the scope of the project and defining its objectives;
- b. *Organization of the Project and of the Team*: this step defines who participates in the project and

- how each team will be organized;
- c. *Project Management and Leadership*: this phase defines the role of the leaders and how the activities of the project will be managed;
  - d. *Tests, Problem Resolution and Prototyping*: this phase focuses on the individual work steps, on the ways they are guided and on the methods to resolve problems;
  - e. *Control and Review by Top Management*: this phase controls the reviews, evaluations and modifications conducted by management;
  - f. *“Real-Time” Corrections*: this phase conducts constant redefinitions of the schedule, organization and activities due to uncertainties in the process.

The model shows that to obtain success in product development, these six elements presented above must be integrated in a coherent and multifunctional system so that the people and phases of the process interact. The question that persists is: ***how to determine these interactions in an organized manner?*** This article will respond to this question.

Based on the concept of innovation, it is noted that two dimensions are involved: novelty, which is the creation of new ideas for solutions, and viability, which is the convergence towards a new solution. Novelty resides in the process of creating new knowledge and leads to new ways of seeing reality and resolving the problems of organizations [2]. Meanwhile, the second dimension involves the technical and commercial viability of the process to materialize products.

Approximation of these two dimensions allows understanding that innovation (above all in terms of new products) requires the intensive use of knowledge. Smulders [14] characterizes the process of development of new products as a learning process given that for there to be an increase in knowledge, it is natural that there is learning, both at the individual and organizational level.

In a conclusive analysis, the strategic characteristic of innovation is clearly noted as well as the importance of the generation of knowledge in the process of innovation and the need to organize efforts to generate innovative attitudes and positions. The literature consulted does not propose more explicit forms of involving people in the effort to seek different alternatives to action in highly competitive markets. This is the proposal of this paper. The proposed model is presented below, along with a practical case that consolidates the proposal formulated. In the case studied, the role of knowledge and innovation is quite visible, given

that the development of new products is seen as a set of programmed innovations, in which companies create new products through existing and new knowledge.

### **3 A model for the Involvement of Individuals in the Innovation Process**

To create, develop and consolidate innovative solutions in processes and products, effective involvement of all human resources of an organization is needed, in a constant effort that strives for excellence in activities (causes) that result in products effectively aimed at exceeding client expectations (consequences).

Human resource management has never been easy. In fact, human resources are those that are the most difficult to understand. For this reason, to involve them in an activity that demands dedication, perseverance and persistence is always a considerable challenge (this is, without a doubt, the case of the search for innovation). They demand more time and investment in the generation of satisfactory results and always have been considered the most complicated resource in organizations.

Despite this complexity, human resources are those that offer greater and better returns, precisely because they are the only ones that generate creative solutions. They are capable of proposing efficient forms of working and faster, more effective and lower-cost methods. That is, they are dedicated to finding new objectives, constantly overcoming new challenges. Therefore, the individual is the only resource capable of transforming organizations [15].

Precisely due to the complexity of human beings, the involvement of people in strategic actions has dimensions that go beyond operational decisions. Thus, two groups of interactions can be considered fundamental in the effort to involve human resources in innovative processes: (1) interactions between organizations and people and (2) interactions among people.

These groups of interactions can be divided into six steps for operationalizing the interactions that compose the effort to have people interact in the effort to search for innovative solutions for organizations. These steps are described below from a broad perspective on the issue.

The first step is intended to give direction to the interactions between people and between people and the organization, defining what each will do. This step includes the following actions:

- a. Initially, it is necessary to clearly and precisely determine the objectives set by the

organization. This process can be conducted interactively considering the characteristics typical of the market where the organization operates and above all the context in which the innovation should be defined as the organization's operational distinction.

- b. Then, also interactively, the actions that will allow achieving the proposed objectives should be made viable. That is: determine the means necessary so that people can do what needs to be done.
- c. These two elements require that the work environments be configured. It is important to state where the actions will be taken.

These three first actions are critical, to the degree in which they have a strong impact on everything that comes afterwards. For this reason, they may take longer to be realized than the actions that compose the other steps. But it is fundamental that they are done well.

Step 2 defines the leaders of the process. This means defining the positions that will have the power to make decisions about specific portions or about the process as a whole. These leaders function as the official representatives of the organization with the others involved. Based on this definition, the relations are constructed between the people and the organizations, thus defining the organization of the work groups. Two sets of actions must be employed here:

- a. Definition of the project administration and of the administrations of the specific actions that compose it.
- b. Structuring of the formal relations between individuals and the organization.

In this step, the demands of each party are made clear - that is what the organization requires of its employees and the retribution that the employees expect of the organization. A clear, complete comprehension and perfect understanding of these aspects is crucial for the entire process. The definition of the process leaders must also be clear as well as the perfect understanding of the functions, attributions and the suitability of the individuals to the positions they occupy.

The third step defines the work model to be adopted. Here there are three actions:

- a. To list the activities to be developed and associate people to them.
- b. The definition of the model of teamwork.
- c. To establish the expected results.

A simple process of value analysis can determine which people should undertake which activities.

Meanwhile, teamwork involves the organization of action groups as a function of the similarity of the profile or of actions to realize. The expected results are defined as a result of both actions, which allows creating a control process for the activities.

The fourth step is characterized by well-defined processes that refer to the organization of information. The proposal here is that these processes be formal, well characterized and perfectly managed. It defines which information will be passed to the teams, always considering the increased efficiency of the operations and the effectiveness of the decisions. To consolidate this step, the following actions are suggested:

- a. The transmission of information is conducted via well-defined and organized processes, involving lectures, seminars, meetings, sharing, etc. It is essential that all these activities are part of a well structured planning process that is perfectly compatible with the objectives set in the first step.
- b. With the information in hand, the actions are classified according to the nature of the teams: strategic, tactical and operational. The first should come before the second, which, in turn, precedes the third.
- c. Once the actions are classified, the respective operational strategies are defined.

The classification of the actions seeks to configure a model for increasing the efficiency in the process by means of the operations undertaken by people. Since the actions are undertaken in a sequence, there is a guarantee that all the activities are aligned with the objectives and characteristics of the teams, and principally, that the operational focus of all those involved is maintained.

In step number five the interactions established in the previous steps are broadened. The goal is now the whole. This step thus seeks the integration of the entire organization. For this reason an exchange of sectors, areas and departments is conducted. Its actions are aimed at understanding the operation of the company in the environment. Thus, it includes:

- a. Definition of the set of relations among people, areas and sectors. In reality, it involves the practical application of the system of information already developed in previous steps.
- b. Broad analysis of the consumer market. Here, the goal is to place the people in the organization in contact with those who purchase and use the products.
- c. Evaluation of the operational philosophy of the competitors. The entire concept of quality is

determined by the action of the competition. Consumers and competitors are those who create the transition from the operating and tactical environments to the strategic context.

This step is comprehensively critical, because it deals, in its two last actions, with the most essential elements of the organization's panel of strategic decisions. This is where the process of innovation management is made concrete. The strategic decisions are proposed at this time.

Finally, the sixth step consolidates the structure and the decisions taken previously. For this step to develop the content, it is necessary that the involvement of people be processed in terms of their culture or according to their values and beliefs. For this reason the following actions are included:

- a. Definition of strategies and motivational mechanisms. This definition is based on a need to show people the reason (why) certain decisions should be taken and others should be executed. The result of this effort is reflected in the engagement of people in the process because they want to, they direct their will to search for innovative solutions and involve themselves with this performance because they are sure that this action is critical to the survival of the organization.
- b. The transformation of quality into value: the people in the organization understand, accept and are committed, or that is, they internalize the concept of quality. They believe this is the critical element in the process for generation of knowledge for the management of innovation. Or that is: they direct their actions to completely serve the consumer market.

In general, this set of steps and actions can be used both to involve people in the strategic effort of the organization and to evaluate the common administrative procedures used. This thus allows redirecting the organization's form of action.

#### 4 Final Considerations

The survival of the organization depends on its ability to compete successfully in a globalized world, with innovation being the most important action that makes this possible. Innovation is a critical means to getting ahead of the competition, conquering new markets or even increasing markets where a company is already present.

Developing new products involves processes for creating knowledge and this knowledge is generated through innovative projects that are transformed into

new markets and new industrial processes. Given this case, it can be concluded, with certain obviousness, that there is a constant need to feed knowledge and stimulate innovative thinking, because this is the only way to create competitive differences that surprise the competition.

Finally, it is worth noting that will and determination are not enough. Planning, organization and actions that involve human resources are needed in the effort to create a strategic direction for an organization.

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