

INNOVATION PROCESS AND BUSINESS FUNCTIONS' IMPLICATION IN THE NEW PRODUCT DEVELOPMENT PROCESS

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ABSTRACT

This paper aims at presenting the implication of the business (organizational) functions into the process of new product development. This process is closely related to the innovation process. So, firstly, the paper offers some approaches to innovation and the phases of an innovation process, which practically precedes the new product development. Secondly, the authors describe the process of new product development as one with seven phases. In each phase, the implication of the five considered organizational functions (the Research and Development function, the Human Resources function, the Finance and Accounts function, the Production function and the Sales and Marketing function), is different. Finally, a graphical representation of the implication level for the organizational functions in the new product development process is developed and discussed.

KEYWORDS: *innovation, business functions, new product development.*

JEL CLASSIFICATION: *L22, O30.*

1. INTRODUCTION

In any national economy, products or services represent an important vector generating economic growth and wellbeing. Since the earliest times, the emergence of new products (generated by technical and technological progress) resulted in an improvement in the results of human activity, and in the living standards.

The importance of new products and services does not only occur at the macroeconomic level, but also at the microeconomic level (or company level). Based on the company's new products an increase in sales, market share or profits can be provided and generally an improvement of the financial indicators of a company.

The innovation is located at the base of new products appearance. It must be circumscribed to restrictions imposed by cost and must satisfy a particular need in order to develop into a new product or service. So, in order to transform itself into a new product, innovation must be validated by the retail market, both from the manufacturer's and consumer's point of view.

The new product development process is a complex and laborious process, consisting of several main phases presented in the paper. These phase are interconnected, it is necessary to carefully plan each phase and consider the results from previous phases. Organizational or business functions bring their contribution to all stages of the new product development process, having a specific

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level of involvement or implication. The paper extensively analyzes this involvement, and also defining elements of these two processes, innovation and new product development.

2. THE PROCESS OF INNOVATION

The multiple attempts to define and understand the concept of innovation, revealed a number of relevant issues, which brought together demonstrate the complexity of the entire process of innovation.

Griffiths (2007), in a slightly philosophical approach, states that innovation is "new knowledge" and also "existing knowledge adapted and disseminated through the economy". Innovation, according to Szymkowski (2005), refers to the entire process beginning with finding the idea and ending with its implementation, whether aiming new products, services, processes, practices or policies.

By West (1990), innovation can be defined as "the deliberate introduction and providing for an individual, group or organization of ideas, processes, products or procedures, new to those users, all designed to bring substantial benefits to the individual, group or society as a whole". Based on the same idea, Lansisalmi et al. (2006) highlights three inherent characteristics of innovation: novelty, a practical component and pursued benefit.

World Health Organization (2014) presents the process of innovation as a cycle with three phases: discovery, development, delivery. Members, supporters of this approach, believe that the iterative model of innovation in the form of three phases, is applicable primarily in the developed countries where there is a very good connection between demand for products and services and real consumers need. For developing countries, they note less demand, although consumers may have quite high needs.

As the Organisation for Economic Co-operation and Development – OECD shows (OECD, 2010), innovation in health is "an interactive and distributed process", which includes five phases. These phases are interconnected like in a circle, and thus repetitive; they are not part of a step by step process type, even if they are taken in turn, below. Thus the five phases, according to the OECD, are:

- 1) Identifying the need
- 2) Research and development
- 3) Marketing
- 4) Delivery
- 5) Diffusion

Besides these two approaches, both based on the cyclicity of the innovation process, there is also an approach of the process by steps; three major steps can be identified (Omachonu & Einspruch, 2010):

- 1) Identifying the need (taking into account stakeholders)
- 2) Identify the way to meet the need, which may involve the development of the innovation within the organization in which the need arises, or its development in institutions of research and development.
- 3) Developing and marketing the new product or service.

A more interesting approach is provided in a recent study of Salerno et al. (2015). They do agree that in a traditional manner, there are certain phases of an innovation process, namely idea generation, selection, development, and launch/diffusion/sales. However, each innovation process follows a different pattern according to the specificity of the field or organization. So, the authors try to answer to the following question "Which configuration of innovation processes and resource allocation should be employed in a given situation, and what is the rationale behind the choice?" (Salerno et al., 2015). Their analysis gives a "taxonomy of eight different innovation processes with specific rationales that depend on a project's contingencies", with implications for both theory and practice, for practice and public policies.

3. THE PHASES OF THE NEW PRODUCT DEVELOPMENT PROCESS

In the literature, there are different views regarding the stages involved in the development of new products, although the global content of the process is relatively the same. The best-known model on the stages of development of new products (on which similar models were built after) was first introduced in 1982 (Booz, Allen & Hamilton, 1982). According to the authors, this process can be divided into seven distinct stages, included in the next figure. We will briefly describe them below.

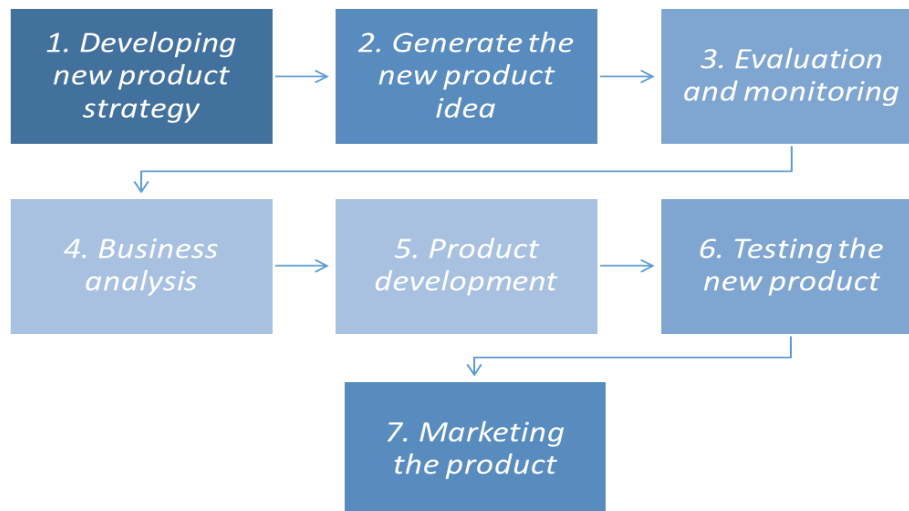


Figure 1. Representation of the seven phases of new product development process

Source: adapted from Booz, Allen, & Hamilton (1982)

1. *Developing new product strategy.*

In general, the strategy defines the overall fundamental objectives of the company, the legal actions to be followed (or strategic options), the resource requirements and the intermediate and final deadlines for achieving these objectives (Nicolescu & Verboncu, 2008). The role of this phase is to establish all the elements mentioned above, closely related to the new product in question.

2. *Generate the new product idea.*

This phase is a very sensitive stage because of its accuracy and truthfulness of the conclusions depends the entire development process of new products. This stage is subdivided in: 1) the critical analysis of exogenous and endogenous company environment (made for instance with the SWOT analysis) and 2) the establishment of defining elements regarding the new product (made for instance through creativity enhancement techniques). They are strongly connected, as the second subdivision starts only after the first ends.

3. *Evaluation and monitoring.*

The role of this step is to eliminate, with very low costs, the solutions that are not plausible ideas (in technical or economic sense) before they move forward to the next stages of the new product development process. The items that are analyzed in this phase for eliminating useless variants, take into consideration the future cost and profitability of the product (in terms of cost and sale price), the payback time for the new product investment, the period requires for launching the product on the market, the availability of resources and so on.

4. *Business analysis.*

Basically, in this stage the result of the previous stage (the variant chosen for the new product or service) is analyzed. In this regard, estimations regarding the projected revenues, that expected to be charged after product marketing (based on information provided by the company's marketing

department who previously studied the market, consumers and competition, the new product production costs, and the production capacity, are being performed.

5. *Product development.*

This is a very important step because it is now when the product is borne. Until now we discussed the idea of a new product or about evaluating its effectiveness (elements more or less tangible). The result of this step is quite concrete, a new product or a service. This stage can last long enough (compared with the previous ones) and inherent malfunctions may occur, as they appear in any innovative process.

6. *Testing the new product*

This stage is on the flow of the new product development and it aims to realize an analysis between what was originally desired.

7. *Marketing the product.*

This is the last stage in the flow of new products development. Now, the product is designed, tested and ready to be sold. Now it is vital for the company to ensure that it has a sufficient amount of new product in order to cover the initial demand or that it has a human resource capable of providing the new product or service to the market.

4. THE IMPLICATION OF BUSINESS FUNCTIONS IN THE NEW PRODUCT DEVELOPMENT PROCESS

In the Romanian literature, five functions of an organization are considered (Nicolescu & Verboncu, 2008):

1. The Research and Development function
2. The Human Resources function
3. The Finance and Accounts function
4. The Production function
5. The Sales and Marketing function

By organizational or business functions, we understand "a homogeneous assembly of similar or complementary work processes that contribute to achieving the same objectives" (Nicolescu & Verboncu, 2008).

Within the 7 phases of new product development process, the organizational functions have a different level of implication, depending on their specificity. In the following we intend to analyze in detail for each phase, the functions' level of implication.

1. *Developing new product strategy.*

In this stage, the function of Research and Development has the maximum level of implication (this function is responsible for developing any strategy at company level). It is followed by the Sales and Marketing function (which should analyze the market to identify potential competitors and consumers and their needs) and Human Resources function (providing human resource in any activity of the company). A lower level of involvement has the Finance and Accounts function (which may only provide information about the financial position of the company and in this way justifies the need for a new product). Less implicated in this stage, is the Production function.

2. *Generate the new product idea.*

As in the previous stage, the Research and Development function along with the Human Resources function have the main role to accomplish. It diminishes the role of the Finance and Accounts function, which joins the other two less implicated functions (Production and Sales and Marketing).

3. *Evaluation and monitoring.*

This phase increases the implication of Finance and Accounts function, which aims to screen the multitude of ideas resulting from the previous phase. A similar implication in this phase comes from have and R & D and Human Resources functions. The Production function and Sales and Marketing function are of minimal implication.

4. *Business analysis.*

Within this stage, the function that had a decisive role so far in terms of implication (R & D function) has a minimal influence, along with the Production function. Instead, vital for this phase are Finance and Accounts function (which analyzes the efficiency of future product or service based on well-developed instruments) and Sales and Marketing function (providing information on sales forecast).

5. *Product development.*

Within this stage, the R & D function returns the forefront in terms of implication. The following two functions, Production and Sales and Marketing have also an important role in this fifth phase.

6. *Testing the new product.*

Within this stage, the primary role is held by Sales and Marketing function; based on investigations made on consumer opinions, tests of market and so on, this function can identify some failures or defects in the product, in order to eliminate them. With relatively the same implication for this phase, are all the other functions of the company.

7. *Marketing the product.*

This phase is characterized by an increased importance of the Production function (which must ensure that it can achieve the required quantity for the new product), the Human Resources function (which must ensure that it can provide the human resources necessary to the new service operation), along with Sales and Marketing function. On the last places in terms of implication are Finance and Accounts function and Research and Development.

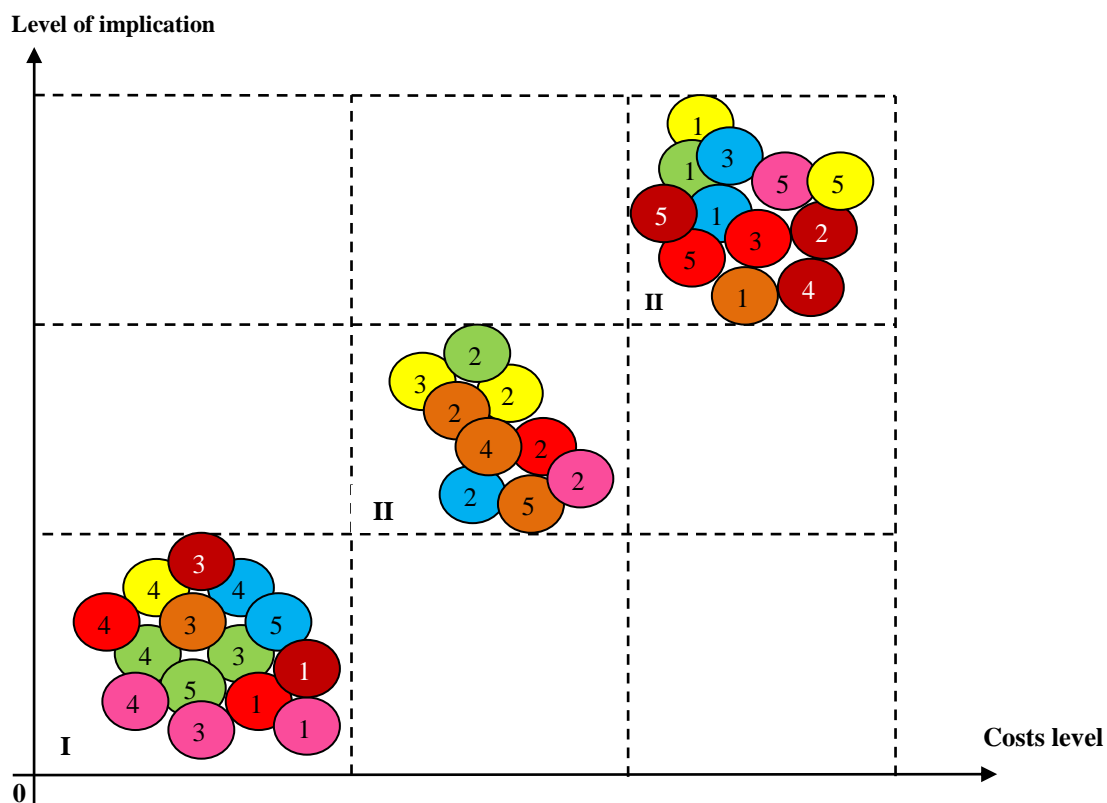


Figure 2. Graphical representation of the implication level for the organizational functions in the new product development process

Source: the authors

Figure 2 shows a suggestive illustration of the company's functions implication degree in all 7 phases of new product development process. In this figure, all functions are numbered from 1 to 5,

in the next order: the Research and Development function, the Human Resources function, the Finance and Accounts function, the Production function and the Sales and Marketing function. With yellow we represented the stage of developing new product strategy, with green the phase of generating new product idea, with blue the phase of evaluation and monitoring, with red the business analysis phase, with brown the phase of product development, with purple the phase of testing new product, and with dark red the marketing the product stage. We created three frames as follows:

- Frame I corresponding to a reduced level of costs and implication;
- Frame II corresponding to an average level of costs and implication;
- Frame III corresponding to a high level of costs and implication (within each frame the physical location of each function is completely random).

By analyzing the above figure, we can build up the next table:

Table 1. The frequency of functions appearance in each frame

Frame	The Research and Development function	The Human Resources function	The Finance and Accounts function	The Production function	The Sales and Marketing function
III	4	1	2	3	2
II	-	6	1	1	1
I	3	-	4	3	4

Source: the authors

It can thus be seen that the organization functions involved in the phases of new product development process is different. The R & D function has the greatest implication which is manifested especially in the first stages of the process. Close to R & D function are the Finance and Accounts function (with has a particular role halfway through, at the stage of „Evaluation and monitoring" phase and „Business analysis" phase), the Sales and Marketing function and the Production function (with a very important role especially in the final part of the process). The Human Resources function has a relatively constant implication (with an average value) throughout the process of new products development.

5. CONCLUSIONS

New products and services have a key role in any human activity, leading to economic growth and improving the living standard of population. The proposed analysis analyzed the new product development process through tools related to management, namely business or organizational functions. The analysis showed that the business functions have a different level of implication in the phases of new product development process. Only the Human Resources function has a constant implication throughout the new product development process. The other functions have a greater impact as follows: Research and Development function appear to be more implicated in the first two phases of the process, while Sales and Marketing and Production function reveal their influence in a greater manner in the last phases of the new product development process (“Testing the new product" phase and “Marketing the new product" phase). The Finance and Accounts function, has a particular role halfway through, at the stage of „Evaluation and monitoring" phase and „Business analysis" phase.

The presented analysis can be performed for other processes within a company. For example, we aim to conduct a similar analysis of business functions implication, but with respect to investment process.

REFERENCES

- Booz, Allen & Hamilton. (1982). *New product management for the 1980's*, New York: Booz, Allen & Hamilton, Inc.
- Griffiths, P.A. (2007). *Science, Technology, Innovation and Growth*. Institute for Advanced Study, Princeton, New Jersey, USA. http://sig.ias.edu/files/pdfs/Kaz_talk_VE8.pdf
- Lansisalmi, H., Kivimaki, M., Aalto, P. & Ruoranen, R. (2006). Innovation in Healthcare: A Systematic Review of Recent Research. *Nursing Science Quarterly*, 19: 66-72.
- Nicolescu, O. & Verboncu, I. (2008). *Fundamentele managementului organizației*. Editura Universitara.
- OECD. (2010). *Biomedicine and Health Innovation: Synthesis Report*. <http://www.oecd.org/sti/biotech/46925602.pdf>
- Omachonu, V.K. & Einspruch, N.G. (2010). Innovation in Healthcare Delivery Systems: A Conceptual Framework. *The Innovation Journal: The Public Sector Innovation Journal*, 15(1): 1-20.
- Salerno, M.S., Vasconcelos Gomes, L.A., Oliveira da Silva, D., Barros Bagno, R. & Teixeira Uchôa Freitas, S.L. (2015). Innovation processes: Which process for which project? *Technovation*, <http://dx.doi.org/10.1016/j.technovation.2014.07.012>.
- Szmytkowski, D. (2005). *Innovation definition comparative assessment*, http://www.interecho.com/~smith/daniel/resources/paper_innovation.pdf
- West, M.A. (1990). The social psychology of innovation in groups. In M.A. West and J.L. Farr (Eds.), *Innovation and Creativity at Work: Psychological and Organizational Strategies* Chichester, UK: Wiley, 309-334.
- World Health Organization. (2014). *Intellectual Property Rights (IPR)*. <http://www.who.int/trade/glossary/story055/en/>