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## PRODUCT AND PROCESS INNOVATION: A NEW PERSPECTIVE ON THE ORGANIZATIONAL DEVELOPMENT

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### Abstract

The emphasis on innovation is one of the distinctive elements of strategies and policies implemented over the last quarter of a century, both within organizations and at national and regional levels. The aim of this paper is to review the most important contributions from the literature in terms of the implications of the two types of innovation: product innovation and process innovation. In organizational context, innovation has diverse materializations, includes product and technology renewal, and organizational changes. Making these changes can have an impact on quality, efficiency, improving the competitiveness and sustainability of the organization.

**Keywords:** Innovation, Product innovation, Process innovation

### Introduction

At present, we are living in an accelerated transition period marked by complex and profound transformations in all areas of activity. The magnitude of innovation is reflected primarily in the high pace of the development of new products and technologies, but the changes are not just about tangible things. Organizations are increasingly involved in innovative actions geared to management, organization and business configuration methods that contribute to the achievement of sustainable competitive advantages (Maier D., 2016 a-b; Maier D, 2017; Popescu, 2016).

In the first half of the last century, Austrian economist Joseph Schumpeter distinguished five innovations: manufacturing new products, introducing new production methods, opening new outlets selling out, creating a new form of organization, discovering new sources of raw materials (Popescu, 2016).

This vision of innovation does not differ very much from the classification of innovation according to the nature of the phenomena it refers to, adopted by the Organization for Economic Co-operation and Development (OECD), which distinguishes the following four categories (OECD, 2005): product innovation, innovation process, marketing innovation and organizational innovation. Schumpeter described innovation as 'a historic and irreversible change in the way of doing things,' and 'creative destruction'. Innovations are defined as new creations of economic significance, primarily carried out by firms. They include both product and process innovations. Product innovations are new or better products (or product varieties) being produced and sold; it is a question of *what* is produced. They include new material goods as well as new intangible

services. Process innovations are new ways of producing goods and services; it is a matter of *how* existing products are produced. They may be techno-logical or organizational. In this taxonomy, only goods and technological product innovations are material. The other categories are non-techno-logical and intangible (Meeus, 2006).

## Product innovation

Product innovation is the one that allows a better product to be offer than the ones currently on the market, in the sense that it offers more functions or performs better (Meeus, 2006). Through product innovation, the company can gain a competitive advantage by differentiating its production and increasing the quality and variety of goods that allow it to grow demand and open new growth opportunities (Maier, 2013; Vadastreanu, 2015 a; Vadastreanu, 2015 b).

Product innovation can be manifested at different levels of complexity, of which the most significant are (Maier, 2018):

- the change of concept, which is based on a new idea, whether or not supported by a new technology;
- making the product using other materials and components with better characteristics than the previous one;
- a new design, which often means more than just a change of shape or appearance, it may involve ergonomic aspects or manufacturing changes;
- new services that accompany the product or find new uses of the product, as such or with minimal changes.

The evolution of a new product can be illustrated in Figure 1.

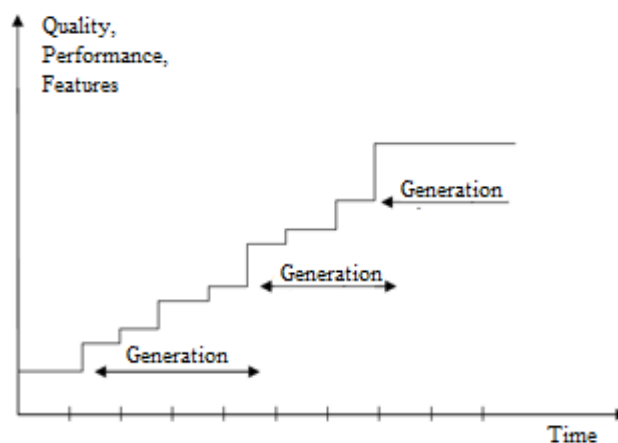


Figure 1 - Evolution of a new product (Meeus, 2006)

Product innovation always meets customer needs, expectations, dreams and wishes through creative products and services that incorporate the latest and greatest knowledge in the field (Figure 2).

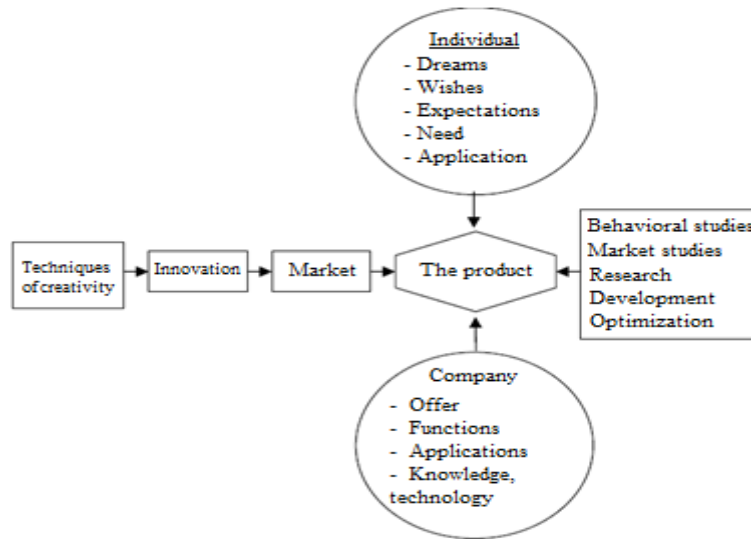


Figure 2 - *The way a new product is born* (Meeus, 2006)

Product innovation refers to the development of goods or services with characteristics or intentions of use that differ significantly from previous products made by the enterprise (Meeus, 2006; Maier, 2012; Olaru, 2013; Maier, 2014 a-b; Olaru, 2016). One of the four strategic options when planning their product or market development strategies is to develop a new product (Maier, 2014a). This option is adopted by the enterprise due to the following:

- existing products no longer meet consumers' needs, their tastes change;
- the environment is changing, new needs are created within the market;
- accelerating the decline of existing products due to the development of new products and technologies by competition;
- due to the total size of the market or the intensity of competition, the growth potential is limited;
- in the life cycle maturity stage a firm has a product portfolio that generates a lot of liquid money;
- Production capacity is under-utilized due to a seasonal variation in demand; competition is intensified in a certain market.

Product innovation has been the subject of several research, including Buijs proposing a product innovation model (Figure 3) showing that product design is embedded in the innovation process, preceded by planning activities that define the type of product for design in interaction with production development and marketing planning.

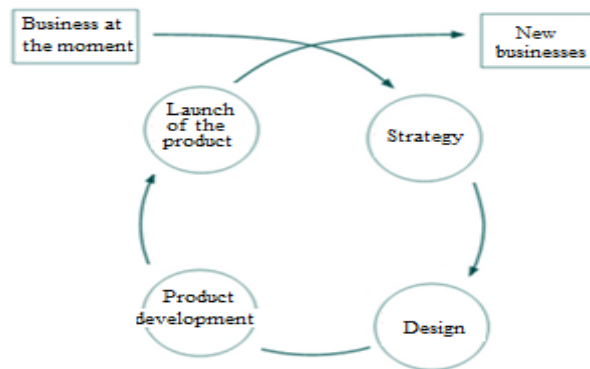


Figure 3 - *Product Innovation Model* (Buijs, 2000)

Developing a new product will be successful as far as these activities are properly adapted. The four steps of the product innovation model consist of formulating the strategy (for example, policy and strategy formulation), designing (finding the idea), product development (development), launching and using the product (its realization).

The product innovation process aims to meet customer requirements by designing and introducing new products to the market that meet the needs of customers, so there is a desire to buy these new products. The innovation process ends with the use of products but at the same time, it is the starting point for a new product innovation process.

Finding new product ideas has greater chances of success if you take into account (Maier, 2014a):

- *Market research and consumer needs* (external research, opportunities and threats);
- *Investigating the strengths and weaknesses of the company* (internal investigations);
- *Getting inspired from these studies and generating new product ideas;*
- *Selection of the most promising ideas for the product and formulation on a mission for further development.*

### **Process innovation**

*Process innovation is the implementation of a production method, or significant changes in specific techniques, equipment and / or software, in order to reduce production and distribution costs, improve the quality, production or distribution of new or improved products, to increase the efficiency or flexibility of a productive activity or supply activity and to reduce the risks to the environment* (Maier A, 2014b; Maier D. 2014; Maier D. 2015).

Even if new products are the visible results of market innovation, process innovation plays an equally important strategic role. Process innovation can be defined as bringing new elements that are introduced into production in an organization. The road to achieving business performance requires a redefinition of the processes that underpin its operation and the increasing use of innovative technologies. In this context, process innovation involves a business process approaching the use of innovation in the key processes of an enterprise and helping to reduce costs or time to produce a good or service (Maier, 2014a).

In general terms, process innovation is the implementation of a production or delivery method of a new method that has been significantly improved, involving technological, equipment or software changes (OECD, 2005).

In process innovation, we can distinguish:

- Innovations of technology flow, targeting flow operations and their chaining. Some examples of meaningful access can be: automation of assembly in the automotive industry, replacement of the milling process, binding of the numerically controlled machine to the designer, etc.
- Innovations in the manufacturing process, which completely change the way of manufacturing. Examples: float glass manufacturing process, Tetrapak packaging, word processing processors.
- Increased innovation that improves results without the need for new knowledge. For example: Moore's law in computer science, reducing the specific consumption of coke in the furnace.

Another important observation is that process innovation is not just about industry processes. Also, the share of product and process innovations also differs according to the degree of maturity of the technology, as seen in Figure 4.

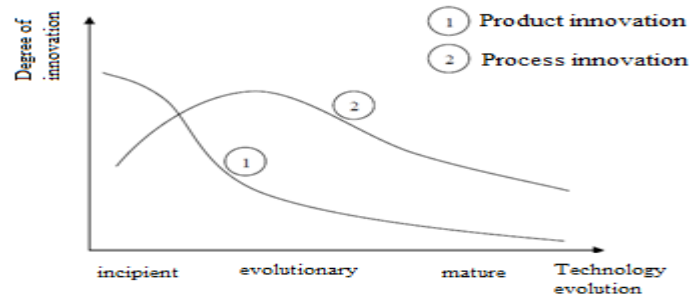


Figure 4 - The relationship between product and process innovation at different stages of the technology life cycle (Maier, 2014a)

In conclusion, all innovations must be characterized by novelty, be it product or process. The novelty of products or processes differentiates innovation from non-innovation. In Figure 5, along with the typology of innovations, we represent the novelty of goods (products or services) and processes recognized by the Oslo Manual in defining innovations. Products or processes may be "new to the firm" or "new to the market" (regional / national or worldwide).

			INNOVATION			<i>Not innovation</i> Already in firm
			Maximum	Intermediate	Minimum	
			New to the world	(a)	New to the firm	
INNOVATION	Technologically new	Product				
		Production process				
		Delivery process				
	Significantly technologically improved	Product				
		Production process				
		Delivery process				
Other innovation	New or improved	Purely organisation				
<i>Not innovation</i>	No significant change, change without novelty, or other creative improvements	Product				
		Production process				
		Delivery process				
		Purely organisation				

TPP innovation       Other innovation       Not innovation

Figure 5- Type and degree of novelty and the definition of innovation (OCDE, 1996)

The proportion of turnover for "new to firm" or "new to market" products in the total turnover of businesses allows for international or sectoral comparisons. However, if we take into account that "new business" refers to the company's market, which may be less developed, including innovations already available in other markets, comparing indicator levels can lead to inappropriate assessments of innovative business performance.

The novelty of products or processes can be more appropriately highlighted by taking into account the turnover from new market innovations, which corresponds simultaneously to products sold on international markets. In this context, we admit that companies operating on international markets are those that introduce products or processes with a higher degree of novelty than those operating on the local or national market (OCDE, 1996).

## Conclusion

Undoubtedly, the role of innovation in economic and social life results from the function of innovation, the introduction of the new and the variety in human activity. In the absence of innovative processes, the economy would enter a "stagnant state" characterized by modest growth or growth-free. As a result, innovation is crucial for sustainable (long-term) economic development.

Most innovation applications have been in the form of new products and technologies, but the waves of innovation are wider. There is a widespread recognition that new ideas can turn any activity, any part of the value chain, products and services to just the visible part of the iceberg.

## Bibliography

- \*\*\*, (2005), *Organisation for Economic Co-operation and Development (OECD)*, Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, The Measurement of Scientific and Technological Activities
- \*\*\*, OCDE (1996). Oslo Manual: The Measurement of Scientific and Technological Activities
- Buijs, J. (2003), *Modelling Product Innovation Processes from Linear Logic to Circular Chaos*, Creativity and Innovation Management, Vol. 12, Nr. 2, pp. 76-93
- Maier, A., Maier D. (2018), *Management ul inovării*, Editura Matrix, ISBN: 978-606-25-0447-2
- Maier, A. (2014a), *Cercetări și contribuții privind dezvoltarea modelelor de management al inovării*, PhD thesis, Technical University of Cluj- Napoca, Romania
- Maier A., Keppler T., Maier D. (2014b), *Innovation the new trend in today's challenging economy*, The 13th International Conference on Informatics in Economy, IE 2014, 15-18 May 2014, București
- Maier A., Olaru M., Maier D., Marinescu M. (2013) *Achieving performance of organization by developing a model of innovation management*, 8th European Conference on Innovation and Entrepreneurship, Sept 19-20 2013, Brussels, Belgium
- Maier A., Brad S., Fulea M., Nicoară D., Maier D. (2012), *A proposed innovation management system Framework - A solution for organizations aimed for obtaining performance*, International Conference on Management, Business, Economics and Finance, 28-29 November 2012, Paris, France, World Academy of Science, Engineering and Technology, Special Issue 71, International Journal of Social and Human Sciences, p. 1581- 1585, ISSN 2010- 376X/ ISSN 2010- 3778, 2012

- Maier D, Verjel, A, Bercovici A, Maier A, (2017) - *Innovation Management System - a Necessity for Business Performance*, 29th International-Business-Information-Management-Association Conference, Vienna, Austria, May 03-04, 2017
- Maier D., Olaru M., Maier A., Eidenmüller T. (2016a) *Importance of innovation in the context of changes arising from economic globalization*, International Business Information Management Association (IBIMA) 27th IBIMA Conference 4 – 5 May 2016
- Maier D., Maftei M., Kepler T., Maier A. (2016b) - *Study on the organizational resistance to innovation*, International Business Information Management Association (IBIMA) 27th IBIMA Conference 4 – 5 May 2016
- Maier D., Maier A., Kepler T., Eidenmüller T., Vadastreanu A. M. (2015) - *Innovation as a part of an existing integrated management system*, 4th World Conference on Business, Economics and Management–BEM 2015, April 30 – May 02, 2015, Kusasasi, Turkey
- Maier D., Olaru M., Weber G., Maier A. (2014), *Business Success by Understanding the Process of Innovation*, Proceedings of the 9th European Conference on Innovation and Entrepreneurship (ECIE 2014), Location Belfast, Ireland, Pages: 534-538, Published 2014
- Meeus, M., Edquist, C. (2006), *Introduction to Part I: Product and process innovation*, [https://www.researchgate.net/publication/241861288\\_Introduction\\_to\\_Part\\_I\\_Product\\_and\\_process\\_innovation](https://www.researchgate.net/publication/241861288_Introduction_to_Part_I_Product_and_process_innovation)
- Olaru, M, Schmid, J, Sarbu, A, Maier, D. (2016), *A Study of the Impact of Investments in Economic Value of the Firm in International Competition*, BASIQ International Conference - New Trends in Sustainable Business and Consumption, Konstanz, Germany
- Olaru M., Maier D., Maier A., Nicoară D., (2013) *Establishing the basis for the development of an organization by adopting the integrated management systems: comparative study of various models and concepts of integration*, 2nd World Conference on Business, Economics and Management–BEM 2013, April 25 – 28 2013, Antalya, Turkey
- Popescu, M. (2016), *Management ulinovării*, Editura Universității Brașov
- Vadastreanu A.M., Bot A., Maier D., Maier A. (2015 a)– *Innovation the new challenge of today's entrepreneurship*, *Science Journal of Business and Management*, Science Publishing Group, New York, USA, 2015, ISSN: 2331-0634
- Vadastreanu A.M., Maier D., Maier A. (2015 b) – *Business success by improving the innovation management*, The 14th International Conference on Informatics in Economy International Conference on Informatics in Economy, Education, Research & Business Technologies, April 25 -28 2015, Bucharest, Romania