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Malaysia, 22 – 23 September, 2013**Evaluation of the innovative business performance**Viliam Lendel^a, Michal Varmus^{b*}^{a,b} Faculty of Management Science and Informatics, University of Žilina, Univerzitná 8215/1, 010 26 Žilina, Slovak Republic

Abstract

The main aim of the paper is highlight the possibility of creating an evaluation of innovation performance in business. The proposal defines different levels of preparedness, the basic evaluation methodologies and evaluation procedures. The proposed evaluation system of innovation performance can be a valuable tool for managers to achieving rationalization of innovation processes in the business. This paper reports the results of research about the achieved level of innovation performance in terms of Slovak businesses.

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Keywords: innovation, innovation performance, evaluation system, business, innovation management

1. Introduction

In the current period, when the market is impacted by the economic crisis the innovations play an important role. Successful can only be those businesses that invest their funds into innovation and research. It is necessary to manage innovation activities in the business.

Most businesses today just do not understand innovation as a necessity, but as a matter of course. To maintain its competitive position it is constantly developing by innovative activities. To be a successful business on the market it is necessary to know the key success factors that affect the achievement of innovation performance. Every business reaches other level of innovation performance. Therefore it is

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necessary to determine the current level of innovation performance, to uncover deficiencies and make recommendations for its improvement. It is necessary to create a suitable methodology for assessing of innovation performance of the business.

2. Objective and Methodology

The main aim of the paper is to acquire new knowledge in the field of innovation management that are focusing on the area of innovation performance and highlight the possibility of creating an evaluation of innovation performance in business. Proposal of the levels of innovation performance in the business can significantly help to identify weaknesses of a business in this area and identify space for further improvement. The proposed system is intended to serve as a control tool during achieving of innovation performance in the business. The aim is to give business managers a tool for self-valuation. The management gets the evaluation of the levels of innovation performance. Solution of the examined issues in the paper requires the use of several methods depending on the character of each part of the solution. For the acquisition and collection of information were used method of analysis of documents (when analysing current and historical data relevant to the issue), questionnaire method and the method of semi-structured interviews (data collection in empirical research), method of observation (visiting businesses).

For the information processing was used mainly method of quantitative assessment (formation of statistical averages, percentages, application of statistical tests and other statistical methods) and the comparative method (when comparing data obtained from the relevant empirical research and the collation of data from the analysis of secondary sources). For solve of the problem were used methods of induction, deduction, synthesis (in developing evaluation system of innovation performance and formulation of its different levels), abstraction and modelling.

3. The Current State of Dealing with the Issue

At present, in domestic and foreign literature may be encountered with the use of multiple definitions of innovation performance, which dominated the following characteristics propensity of a firm to actively support new ideas, annual growth rates of innovation input and output and important aspect of worker performance. From the wide spectrum of opinion marketing theorists and practitioners can be chosen the most accurate definition of innovation performance. Table 1 summarizes the definitions of the term innovation performance.

Table 1. Definitions of innovation performance

Author(s)	Definition
<i>Hung-Wen and Ching-Fang (2010)</i>	Innovation performance is a measurement of the performance of an adopted new approach or a new measuring criterion to measure organizational performance.
<i>Wang and Ahmed (2004)</i>	Innovation performance is defined as the propensity of a firm to actively support new ideas, novelty, experimentation, and creative solution.
<i>Gantumur and Stephan (2007)</i>	Innovation performance is defined by the annual growth rates of innovation input and output, knowledge stock, and research productivity.

Based on the study of domestic and foreign literature can be said that the base of innovation performance most accurate rendered Birchall et al. (2004). Because according them the innovation performance includes provisions for assessing the effectiveness of the innovation activity in terms of business success. They point out that innovation performance measurement must go beyond mere after-

the-fact measures based on macro-level input/output indicators. It must address the right balance of soft and hard innovation parameters for effective short-term and long-term innovation decision making (Birchall et al. 2004).

Ryan (2010) points out that the relationship between the definition of innovation and innovation performance is how fast, how well ideas are implemented and how much value are created.

Anders Vang Helgesen (2009) defined central factors that influence the innovation performance of an organisation. These factors are *strategy, structure, culture and the external environment*.

Booz Allen Hamilton argues that all organisations have an intrinsic innovation performance curve which can be plotted easily by comparing the net present value of each project in their development pipelines and the required investments of those projects. Hence, this curve becomes very important as it predicts the future revenue, profit and growth of the innovation or in other words the innovation performance of the organisation (Hamilton 2004).

According to Neely and Hii (1998), the importance of measuring innovation performance is twofold. First, the information derived from measurement serves as feedback on a firm's current standing in innovativeness. Second, the gaps in performance trigger a systematic process of continuous improvement. Without performance measurement, the process of innovation will not be managed effectively and improvement will be sporadic (Neely, Hii 1998).

4. Proposal of the evaluation system of innovation performance in business

On the base of carry out research Lendel & Varmus (2012b) propose five-speed breakdown *levels of innovation performance in business* (Table 2).

Table 2. Levels of innovation performance in business

Level	Characteristics
Chaotic level	Is responsible to business, which has not a primary interest in working with innovation, and generate innovative activities. Management has no specific idea about the work of innovation in the business. Business does not register inventions and innovative opportunities. The business follows the usually routes and doesn't develop new initiatives. Often does not work communication in the business and management staff do not know the vision of the future of the business. This level also features an unsatisfactory organizational structure.
Insufficient level	Is responsible to business, which can be seen beginning the efforts to work with innovation. The management has got a specific idea, but that is not included in long-term business plans. Invention and innovation opportunities are already registered, but without a consistent approach. Employees aim to meet the specified tasks. For this level is characterized by an organizational structure with a lack of information flow security.
Acceptable level	Is responsible to business that meets the minimum level of innovation performance. The management of innovation involves the long-term plans and committing the necessary resources for their search. New innovative ideas are recorded in the business. Employees try to find a solution otherwise. In organizational structure are still problems in sphere of secure corporate communication.
High level	Is responsible to business, which is on track to become the top innovator. Management supports the work of innovation determines the future direction of innovation. The business will keep reliable records on the state of inventions, innovative opportunities and innovation. Employees make full use of your imagination and creativity. Within the organizational structure works as a secure of information flow, as well as effective corporate communications.
Excellent level	Is responsible to business, which can be moved to a group of top innovators. Innovation management fully supports the work of innovation and actively engaged in the process of employees. In the business there is sophisticated system of work with innovations, including their records. Lateral thinking is most often applied to solve the problems. Pro-innovation corporate culture and organizational structure creates a favourable environment for further progress in the field of business innovation.

For internal purposes (monitoring to improve innovation processes, marketing staff motivation, reward system...) it is very desirable to have a value that represents the overall level of innovation performance in business. Such a tool is index of innovation performance.

In determining the method of calculating the index of innovation performance based on the same principles that apply in calculating the index of customer satisfaction. This means that the calculation enter particular two measured values. It is a measure of the importance that managers put to elements affecting the innovation in the company and performance that a company makes in these elements.

To calculate the index of innovation performance requires the calculation of weights (v). When calculating the weights are based on the degree of importance:

$$v_i = \frac{w_i}{\sum_{i=1}^N w_i} \quad (1)$$

where:

- v_i – weight of i-th element
- w_i – measure of the importance of the i-th element
- N – number of elements affecting the innovation performance in the company

The index of innovation performance in the company is calculated by the following formula:

$$Ip_i = \frac{\sum_{i=1}^N v_{ij} x_{ij}}{10 \sum_{i=1}^N v_{ij}} * 100 \text{ [%]} \quad (2)$$

where:

- Ip_i – index of innovation performance of i-th company
- v_{ij} – weight of i-th element
- x_{ij} – performance achieved by the i-th element
- 10 – refers to the range used (scale 1-10)
- N – number of elements affecting the innovation performance in the company

The overall index of innovation performance is the average of all individual indices of innovation performance. Using index of innovation performance seeks the gradual improvement by reducing the difference between the rate the importance of various elements and evaluation of their performance.

The first step in measuring innovation performance in business is the formulation of appropriate elements (criteria). Based on these criteria and their assessment of the importance of their achievement it is impossible to ascertain to what extent the company is ready for the successful work with innovation. Where are the areas for improvement, what the priorities are and what elements are most important from the perspective of managers in achieving of innovation performance. Based on the analysis of domestic and foreign literature (Janovčik and Mičieta 2010; Lesáková 2010; Tidd et al. 2007; Birchal et al. 2006), it can be also concluded that to the innovation performance significantly affect five basic (key) elements. It can be written in the form of function with five variables that affect the innovation performance:

$$I_P = f(A_I, I_{BE}, P_D, I_{PM}, H_R) \quad (3)$$

where:

- I_P – Innovation performance
- A_I – Approach to innovation
- I_{BE} – Interaction with the business market environment
- P_D – Product development
- I_{PM} – Innovation process management
- H_R – Human resources

The following table shows the elements together with a description of covered activities.

Table 3. Characteristic of particular elements of innovative performance

Element	Description
Approach to innovation	Clearly defining the vision and mission of the business; the business's vision speaks of innovation; the business constantly looking for new ideas to improve services or processes; in the business there IS for recording, classifying and evaluating innovative ideas; the business is providing training in the field of innovation; business constantly creates investment decisions (buying, renting equipment, etc.); business has a clearly defined innovative strategy; the business is a continuous process of learning; in the business there is a systematic approach for managing innovation.
Interaction with the business market environment	The business regularly carries out market research; the business continuously detects the needs of its customers; customer's demand for products and services are collected at each stage of the innovative process of the business, the business effectively uses its partnerships; the business regularly looks for new market opportunities.
Product development	Certain percentage of the business incomes is from new or improved products and services, products or services are being improved continuously, products are regularly compared with competitors due to their performance, in the business there is internal research and product development, the business evaluates the success of innovative projects; between development departments is an active communication.
Innovation process management	In the business are project teams, project centres or temporary organizational structures; the business has a system to track competitors; the business documents and knowledge are commonly used (systemic); the business uses some methods to improve and measure the effectiveness of business processes (BSC, TQM, SWOT analysis, etc.); the business processes are able to efficient development of new products; the business has established mechanisms for selection of good business ideas; the business processes are flexible enough to allow realize innovative projects.
Human resources	In the business there are more than 75 % of employees are innovative or they are engaged in innovations; employees in the business have sufficient knowledge to deal with innovation; the business structure creates suitable conditions for the development of innovation; the business regularly provides training to its employees and thus creates the continuous development; the business structure provides sufficient decision-making powers for the implementation of innovative projects at every level; in the business is implemented a remuneration system.

Based on made calculations of the innovation performance in business has been prepared comparative table on the basis of its innovation performance index (Table 4).

Table 4. Comparative table – innovation performance index

Level	Index of innovation performance (interval %)
Chaotic	0 – 30
Insufficient	31 – 50
Acceptable	51 – 80
High	81 – 90
Excellent	91 – 100

5. Application of the proposed evaluation system of innovation performance in business

Lendel & Varmus (2012b) carried out research from May 2009 to end February 2011. The research was focused to the detection level of innovation performance in the medium and large businesses operating in Slovakia. Managers had available the evaluation form, in which they should evaluate activities in the key elements of innovation performance (listed in Table 3) that most closely matches the actual situation. The evaluation form completed 380 businesses.

It was obtained that innovation performance indices (in %) reflect the current state of innovation performance in business. To determine the level of innovation performance was used a comparative table. The following table expresses intervals (in %) and what is required for the inclusion of business to one of five levels of innovation performance. Now it includes the obtained results.

Most businesses are located in an acceptable level (up 58.42 %). It is seen this as a positive fact and a good basis for further activities of businesses in implementation of innovative activities. On the other hand it is seen as a negative the essential part of businesses located in the chaotic (14 businesses – 3.68 %) and insufficient (97 businesses – 25.53 %) level. These businesses must revise their current marketing and innovation policy. Managers of these businesses may be recommending:

- Develop work plan for innovation in the business marketing, including how to achieve it,
- Overhaul of corporate strategy in order to include product and process innovations,
- The allocation of sufficient resources (human and financial) to innovate and search,
- Introduction of a transparent record of innovative initiatives, ideas and innovation,
- Introduction of a transparent record of marketing knowledge workers and ensure their mutual sharing,
- Use non-traditional methods of thinking,
- The establishment of pro-innovation climate for the development of innovative ideas, creating space for open discussion of innovative ideas and work in teams,
- Increasing interest in innovation management and innovation strategy,
- Developing a suitable incentive program to encourage marketers to deliver new, innovative ideas and initiatives,
- Implementation of system for monitoring of innovative competitors activities especially in the field of product policy,
- Developing the activities towards effective use of partnerships,
- Regular evaluation of innovative projects,
- Establishing of cooperation with innovative external subjects such as research and educational institutions,
- Create a mechanism for selection of appropriate innovative ideas in order to avoid duplication and loss of innovative ideas.

Table 5. Level of innovation performance in businesses according to the comparative table

Level	Index of innovation performance (interval %)	Number of businesses	
		Absolute values	Relative values (%)
Chaotic	0 – 30	14	3.68
Insufficient	31 – 50	97	25.53
Acceptable	51 – 80	217	57.10
High	81 – 90	49	12.90
Excellent	91 – 100	3	0.79

It can be seen that 12.90 % of businesses reported a high level of innovation performance and three businesses achieved an excellent level of innovation performance.

6. Conclusion

Currently, businesses try to use innovations, because their helps to influence and shape their surroundings. The Business's task is to do for the customer uninteresting the business competition by making of innovative solutions. This requires, that business to be able to identify their weaknesses and take the proper measures to support innovative activities. Just for this it is proposed system for evaluation innovation performance of the business, which can help to business managers to effectively use the innovation potential of the business.

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