

# Identification of the Main Problems in the Management of Innovation Processes and the Draft of Appropriate Recommendations

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**Abstract.** Management of innovation processes in company is the field of innovation management which is still not enough researched and applied in practice. Managers in companies often do not know about modern techniques and design tools for creating innovation processes and also as about the possibility of their effective usage for management and effective usage in decision-making conditions. The purpose of this paper is following a detailed analysis of literature and realized research to create a model of innovation processes management in the company. There are also identified the main fields of potential problems, which should be discussed by managers to achieve effective functioning. The solution of the questions researched within the article needs to use several methods depending on the character of particular parts of the solution.

**Keywords:** Innovation · Innovation process · Innovative ideas · Management · Company

## 1 Introduction

The issue of management of innovation processes is currently very actual. Innovations are an important tool for increasing competitiveness of companies. Companies do not develop their innovation activities on the basis of “impressions” or “intuition”, but on the basis of knowledge obtained from the opinion survey of customers, employees and partners. They collect the necessary information and innovative ideas, reveal innovative opportunities and make decisions about the need to innovate. The aim of the companies is to realize their full potential for innovation. However, in order to be successful, it is necessary to effectively manage these activities and to be able to quickly and flexibly respond to developments in the market. Right there is a place for the identification of major problems and draft of appropriate recommendations to ensure the effective use of market opportunities through innovation.

The main purpose of this paper is to gain new knowledge in the field of innovation management with a focus on the identification of the main problems arising from the

management of innovation processes and to point out to the possibility of proposing appropriate recommendations to minimize them. The identification of the major problems can significantly contribute to improving the management of innovation processes in Slovak companies. The recommendations should serve as a valuable tool for managers to a successful course of innovation processes in the company.

Solving of the examined questions in the paper requires the use of several methods, depending on the character of the various parts of the solution. For gathering and collection of information the analysis (the analysis of current and historical data on the issue), questionnaire method and semi-structured interviews (data collection in empirical research) were used. In the processing of information the quantitative evaluation method (statistical techniques) and the comparison method (when comparing data obtained by empirical research and analysis of data from secondary sources) were used. In order to solve the problem the methods of induction, deduction, synthesis (in the identification of the main problems arising in the management of innovation processes and the formulation of appropriate recommendations), abstraction and modelling were used.

## **2 The Current State of Dealing with the Issue**

Innovation process can be considered on the base of scientific literature analysis as an organized and controlled sequence of activities where inputs, in the form of innovation ideas, are transformed into outputs, in the form of innovations. It is a process of recognizing customer needs and innovative opportunities, generating innovative ideas and their elaboration, work with information and knowledge regarding innovation, realization of innovative activities and ensuring successful extension of innovation among customers [7].

Since new customer needs are created on the base of extension and usage of a new product, an innovation process can be understood as a repeating process [13]. Furthermore the number of innovation processes is not limited. Innovation process has also a built-in mechanism of learning, i.e. a mechanism evaluation of incurred failures and deviation in all phases of the innovation process [12].

The mechanism is supported by feedback in all phases of the process [12]. This mechanism is also supported by its openness which allows the company to adopt innovative ideas, necessary licenses for research and development from the external environment [5]. In the case of non-utilization of own innovation solutions, it should offer these solution to other companies, in the base of license.

In the scientific literature [1, 3, 5, 10] it is possible to find a number of theories trying to explain to managers companies how to create innovations and which factors influence the result of this process. These theories look on the innovation process from different points of view while the effort to create the complex view of innovation activities in a company can be considered the integrating element. In many cases, however, this effort leads to excessive complexity and ultimately to confusion, which often affects the decision-making of manager of the company.

Several authors [1, 4, 9] point to the fact that the issue of innovation processes run diverse research that is still disunited and inconsistent. Creation of a unified view to the innovation process is significantly impeded by the following factors:

- innovation management is based on a number of scientific disciplines and it cooperates with them,
- the objects of research are various types of industries and markets, which have their own specific effects and signs,
- the object of interest of theorists and practitioners are various types and forms of innovation, such as technological, organizational, products, process, and so on.

These are the main disadvantages of current work. On the base of the detailed analysis of the various approaches to the innovation process management in the company by various authors as well as the evaluation of the practical approaches can proceed to the systematization of lessons learned. This is a summary of the main benefits of different innovation process models that provide resources for creation of a comprehensive model for the innovation process management (Table 1).

Skokan [11] highlights the growing importance of regional innovation systems, which enable easier sharing of tacit knowledge and increase the capacity for localized learning. A factor to promote innovative activity is capacity of identifying opportunities that allow for changes and new business inside and outside the company through alliances and strategies supported on the use of ICTs, so that the organization becomes pioneer in its action field [2].

### 3 Results of the Empirical Research

Between October 2012 and January 2014 we conducted a research, whose primary goal was to gather and interpret information about the level of use of innovation processes management in the environment of Slovak enterprises. In total, 321 managers of small, medium and large enterprises from companies active in Slovak republic took part in the research. Calculated recommended sample size was 384 respondents. The survey covered 321 respondents. Following the conversion, the actual sampling error was at the level of 5.46%.

The survey focused on identifying situations in the various phases of innovation process. The first field of interest was represented by innovative ideas which may accrue from a variety of sources. In terms of Slovak companies, customers and their identified needs are the most frequently used source of innovative ideas (in 228 companies). The most frequently used sources of innovative ideas also include employees of the company (in 194 companies), analysis of competitive products and services (in 187 companies), Internet (in 175 companies), exhibitions, conferences, trade shows (in 166 companies), journals and publications (in 159 companies). As a significant source of innovative ideas can also be considered own research activities (115 companies) and the research of the partners of the company (in 98 companies).

Managers of Slovak companies indicate customer needs analysis as a source of the most successful innovative ideas, respectively ideas with the greatest potential. Customer focus should also be implemented in the management of innovation processes.

**Table 1.** Benefits of different models of innovation processes

Author(s)	Emphasis	Fortification
Imai et al. [6]	Functional integration	Integrated innovation process
Rothwell [10]	Electronic data processing	Information assurance of innovation process
Dvořák et al. [3]	Feedback and creative activity	Cross connection of innovation process
Vlček [13], Mol and Birkinshaw [9]	Needs dissatisfaction with status “quo”	Needs/dissatisfaction as the main launcher for innovation process
Bernstein and Singh [1]	Manifestation of management (control element)	Organization of the innovation process for site management
Tidd et al. [12]	Timing and learning	Innovation process base on a continual improvement
Skokan [11]	Systematic approach Role of environment	Innovation system (national, regional) Local innovation process
Chesbrough [5]	Level of openness	Bounded (closed) Unbounded (open)

As resources for successful innovative ideas the respondents considered also their own research activities and their own employees. In this case it is necessary to finance and support their own research activities, create a favourable environment for their workforce and care for their educational development.

The importance of customers confirmed the fact that only 257 companies (80.06%) create innovative ideas based on the input from customers and their requirements. Another stimulus for generating innovative ideas is finding a specific problem (186 companies, 57.94%). This means that these companies prefer the opposite strategy, it means they do not apply a proactive approach, companies create ideas only in the case of arising problem. Other less used incentives include business needs (81 companies, 25.2%) and new technologies (72 companies, 22.43%). As a positive can be considered that only 9.03% of companies generate the innovative ideas at random and only 5.92% of Slovak companies do not generate them at all.

Companies in Slovakia do not use an information system to work with innovative ideas (recording, sorting, distribution...). This was confirmed to 61.28% of managers surveyed. The information ensuring of innovation process has only 28.96% of respondents, the most used information system is a system provided by the company [Salesforce.com](https://www.salesforce.com) (16.72% companies). Other companies use their own IT solution. In the survey 9.7% of the respondents were not able to express their opinion about the use of the information system to work with innovative ideas.

Managers of Slovak companies identified as the main criteria for deciding on further elaboration of innovative ideas into innovative opportunities availability of funds (involved in decision-making to 25.81%). Other important decision criteria are the reality of demand, technological options, available knowledge in the issue and the

availability of human resources. In terms of priorities for decision-making are time and the physical space in the development phase less involved.

The most used methods in the deployment phase of innovation are the techniques of development of the creativity (42.99%). The quite frequently used methods are conceptual methodological tools (24.61%), forecasting methods (19.63%) and pragmatic methodological tools (19.31%). On a small scale are also used techniques of knowledge management (14.64%) and innovative graphs (7.79%).

As major problems hindering the effective management of innovation processes by the managers are considered: the lack of the necessary financial resources to ensure the innovation process (210 companies), distrust of the company managers to the possible outcomes arising from a lack of innovation (187 companies) and missing information ensuring the innovation process (168 companies).

## 4 Management of Innovation Processes in the Company

Management of innovation processes in the company is a real problem, which are managers of the company faced. Number of factors participates in its provision, from theoretical concepts, through model solutions to practical applications. The biggest or the most significant problem can be seen in an absence of unified or complex and at the same time transparent management innovation processes model in the company. It can be said, based on the results from realized research, that on the present many companies try to manage their innovation activities and processes intuitively. However, companies must often solve various problems caused by their unpreparedness to manage innovation processes. A requirement to create a comprehensive and transparent innovation processes model, which would be a significant aid for managers, resulted from interviews with several representatives of companies within realized research. The benefits from this model would appreciate not only managers, but also customers, because their communication with company related to preparation and assurance of products and services by fulfilling customers' requirements and needs. This can lead to the elimination of a number of problems both from companies and its customers.

A management innovation processes model in the company (Fig. 1) was designed on the basis of views of various authors dealing with the issue of creating a model for managing innovation processes in the company and also after careful analysis of mentioned approaches to the development of innovative processes. Solution is based on a management of innovation portfolio model according to Hamel [4]. His definition of innovation has two approaches. First it represents competences that need to be built, and second it is a process that needs to be implemented in the company. Therefore is model made up from two main parts, specifically: innovation process and innovation competences.

Innovation process is a sequence of activities aimed at creation and implementation of innovation. It includes activities related to generating innovative ideas, their evaluation, creation of innovation and ensuring its spreading among customers. A transparent model of the innovation process was developed to better understand its single phases. It is based on the basic model by Zaušková and Loučanová [14]. However, it is enhanced by identified key elements. Specifically, it is about adding the first phase of

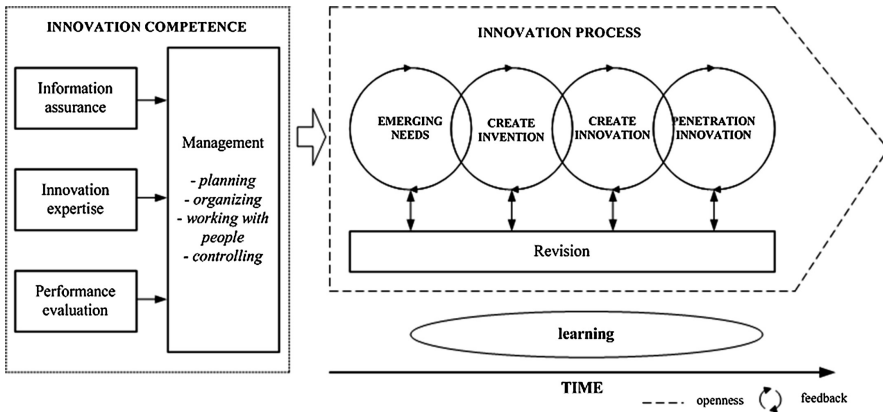


Fig. 1. Management innovation processes model in the company [7]

the innovation process aimed at creating the need, or dissatisfaction with the status “quo”. Need, or dissatisfaction is perceived as the main trigger of the innovation process. This fact was highlighted by authors Vlček [13], Mol and Birkinshaw [9]. Furthermore, in the innovation process is regarded the degree of openness, of which importance noticed Chesbrough [5]. It is a boundless innovation process that allows flexible work with innovative ideas, which come to the company both from the internal and from external environment. Company can offer unused innovative ideas to other businesses by licensing, and vice versa, if necessary, it may acquire innovative ideas from external environment. Next element is feedback, which is highlighted in the innovation process. It allows to overcome problems accrued in the various stages of the innovation process. This is an approach proposed by Dvořák [3] in a form of chain links in the innovation process. Innovation process takes into account also the element of learning, which should contribute to a continuous improvement of the process. Tidd [12] considers learning as a critical point in the management of innovation. Company can learn through the procedure in the innovation process and thus improve its management methods.

According to Hammel [4] innovation competence are understood as a tools which allows company to use in innovation process management innovation tools, supported communication and information technology, management processes and appropriately to establish criteria for measuring the success of the individual phases of innovation projects:

- Innovation expertise,
- Information security,
- Management (planning, organizing, leading people, control),
- Evaluation of the level of innovation processes management and innovation performance.

On the base of the proper usage of various management functions (planning, organizing, leading people and controlling) the innovation process should be

effectively managed. The communication is important role in this process. An essential foundation for the successful management of innovation processes in the company can be considered an effective system of information security innovation processes. Another innovation competence is innovation expertise. It is necessary that the company management is supports the creative human potential. This means that employees how to fully use their skills and capabilities to ensure the innovation process.

In order the innovation processes should be managed effectively it is necessary to report some results in fields which affect to the management of innovation processes. Every company has a different level of management of innovation processes. Therefore, it is necessary to identify in the first step the current level of innovation process management in the company, then discover weaknesses and make recommendations for their improvement. It is necessary to build up an appropriate methodology for evaluating the innovation process management in the company.

## **5 Identification of the Main Problems and the Proposal of Suitable Recommendations**

The management of innovation processes in the company is for managers a challenging task. Causes of failure in this process can be multiple and may have a different character. For example, there may be a lack of innovation expertise, failure to secure information flow in the company, lack of education and motivation of employees and so on. Reasons of failure in the management of innovation processes are affected several actors. Firstly, they are managers, in the case of lack of support to innovative activities in the company, employees of the company, in the case of passive participation in the innovation process and customers, in the case of indifference in providing an added.

The management of innovation processes cannot be carried out only intuitively based on the development of the situation. This is a complex process with a numbers of aspects: the state of innovation potential, built IT infrastructure, staff evaluation system, organization and so on.

The task of these recommendations is to help reduce the risk of identified problems. They are designed to help the managers in the management of innovation processes, as well as prevention of the occurrence of problem situations. These can arise in the following areas:

- Problems in the information security of innovation processes,
- Problems in ensuring the innovation expertise,
- Problems in the application of management elements in the innovation process,
- Problems in measuring of innovation performance,
- Problems in the innovation process and the process itself.

***Problems in Ensuring the Information Security in Innovation Processes.*** As a problem arising in this field can be considered the inefficient information flows in the company. This is the reason of misunderstandings and employees cannot realize their innovative tasks entirely.

It is recommended to the managers to ensure the efficient work with information related to innovation in the company. This means that it is necessary to ensure the access to information to all interested parts in the innovation process, and it is necessary to collect all valuable information in one database and apply the principles of effective work with information.

Another problem is the lack of information systems to work with innovative ideas, opportunities and innovations. In many cases there is no evidence of implemented innovations and innovative ideas generated in the company. This often means that the potential innovative opportunities are left unused.

It is recommended to the managers to make a comprehensive record of innovative ideas and innovations in the company. Every innovative idea in the company have to be recorded and assessed. Same importance has the record of the currently unusable innovative ideas which have potential value for the future.

***Problems in Ensuring the Innovation Expertise.*** One of the problems in this area are the personal characteristics of managers and employees of the company focused on emphasizing their ego, what is seen in the subjective view of the solutions to the problem and ignoring acquired facts and reality. The result is incorrect decisions that adversely affect the conduct of the innovation process.

It is recommended to managers to evolve personal characteristics oriented to empathy, teamwork and also to logical thinking and self-criticism.

Insufficient implementation of knowledge management belongs to the common problems in the field of innovation expertise. On the one hand it is reflected as a lack of knowledge of the employees, on the other hand, much of the knowledge created in the innovation process is forgotten or lost. The result is unnecessary, repeated creation of new knowledge which is already created in the innovation process.

In the first case it can be recommended to the managers to ensure the management training courses designed to supplement the necessary knowledge to employees. In the latter case it is necessary to provide recording and archiving of acquired knowledge in the innovation process through the implementation of appropriate IT solutions.

In the area of ensuring the innovation expertise can be seen as a problem an inadequate usage of creative thinking in the development of ideas to solve the problem. The result is low number of ideas that do not allow to take a decision to resolve the problem.

It can be recommended to the managers to develop human creative potential in the company. It is necessary to create conditions for application of creative thinking selecting appropriate exercises to develop creative skills and abilities of employees. It would also be appropriate to create innovative teams, including representatives of the young and old. Innovative team should include representatives of several departments of the company (production, sales, logistics, trade, service).

***Problems in the Application of Management Elements in the Innovation Process.*** Problem is the lack of a coherent methodology for the management of innovation in the company. The managers can often exchange the innovation process by using of a simple type of creative brainstorming techniques. In many cases, they are in time and work stress and they do not pay attention to the support of innovation and integrating innovations into long-term strategic plans of the company.



The managers may be encouraged to pay more attention to innovative activities of the company, turn them into long-term business objectives and incorporate them into innovative business strategy. It is also recommended to attend educational activities objected to the managing of innovation processes.

Another problem is the lack of development of the innovation program. In many cases, managers do not have sufficient information about available resources and means when they plan innovative activities. The result is the increased probability of failure of implementation of the innovation project.

It is recommended to carry out a detailed analysis of the current state of innovation potential and application of methods and techniques of project management.

Another problem is the absence of remuneration for innovative ideas and appropriate motivation program. The result is the passivity of employees who are not motivated to bring new innovative ideas and engage in innovative task solutions beyond their tasks and responsibilities. It is recommended to the managers to establish a fair system of remuneration for innovative ideas. It is necessary to develop appropriate motivation program, which involves employees in innovation activities of the company. Employees will be informed of the expected changes and motivation program will encourage open communication within the company.

Failure of the management of innovation processes can be caused by unsuitable organizational structure, which does not allow open communication between the stakeholders and does not support new innovations. It is recommended to the managers to rethink the current organizational structure, creation and implementation of flexible organizational structure that will have the ability to respond to changes in business environment and allow fast exchange of information, organization of meetings and activity of innovative teams.

***Problems in the Measurement of Innovation Performance.*** A common problem in this area is non-evaluation of effects and benefits of implemented innovations. The result is that the company has no feedback on the adoption of innovations by the customers, cannot measure their performance and take measures leading to continuous improvement of the management of the innovation process.

It is recommended to the managers to create an evaluation system focusing on the diagnosis of the results and contributions created and on the market launched new products. Based on the results it is also recommended to formulate measures to improve the management of the innovation process.

***Problems in the Innovation Process and the Process Itself.*** A common problem is, that the first and the second phase of the innovation process is carried out insufficiently. In many cases it can be observed the development of the first innovative idea that pops up without detailed analysis. The result is the frequent changes and increased costs of implemented innovative projects. It is recommended to the managers to carry out a detailed analysis of all the innovative ideas and suggestions from internal and external environment. It is necessary to pay attention to the first two phases of the innovation process because they affect its success. Only the identification of valuable innovative ideas can bring successful innovation.

Another problem is the application of an inappropriate model of the innovation process, which reflected to a lack of a clear definition of the problem, the lack of

coordination of activities, communication and cooperation within the staff of the various departments, but also of the stakeholders. The result is the unsuccessful management of innovative projects. It is recommended to the managers to be careful in choosing the model of the innovation process. It is necessary to know the company conditions, the level of knowledge of employees, the information security, the set of business processes and so on. There is a place for the usage of feedback in each phase of the innovation process, which may indicate deficiencies caused by improper setup.

The main problems include the lack of a mechanism for learning, which evaluates errors and variation, documented knowledge, rules and principles. Without its usage the continuous improvement of the management of the innovation process cannot be ensured. It is recommended to the managers to actively use the knowledge, closely monitor the progress of the innovation process and learn from the results of the different phases.

## **6 Management on Innovation Processes in Selected Company**

The selected company for the presentation of practical management of innovation processes is KROS, a.s., which deals with the development and distribution of economical, constructional and expert software since 1995. The main identified problem is the inadequate information security of innovation processes, particularly in respect of effective work with innovative ideas. These ideas are obtained from various sources (customers, employees) and they are recorded in different information systems, which complicates their usage, because of potentially good idea which might go unnoticed or duplication of ideas. Many information are not recorded in the IS and they are available only to certain employees and stored in their minds, which prevents their proliferation and usage. Subsequently the rationalization of innovation processes was designed:

- all innovative ideas, obtained from customers and employees will be recorded in one common information system,
- innovative ideas will be evaluated in the system by more employees and customers.

In product development it is important to understand that freedom stimulates creativity, and therefore employees should be respected and their creativity should be encouraged. Subsequently, the follow principles of creating innovations were recommended to the company:

- integration of multiple perspectives, it means integration of sales employees, development, consultants and customers and together create products that will meet the needs of customers. To unite these people in one team across several departments.
- Highlighting the importance of the human factor in the management of teams, where the leader should be the element that starts innovative thinking within each team. For this it is advisable to use SCRUM.
- Emphasis on added value for the customer and understanding the vision of the company in which is the satisfaction of customer in the first place.

The mentioned recommendations aim to continue in the trend of increasing the number of customers (currently over 74,000) and to maintain the leading position in the Slovak market.

## 7 Conclusion

Effective management of innovation processes should identify weaknesses (gaps) and take measures to eliminate them [8]. It should also be capable of delivering the necessary information related to innovation to responsible persons. A company should be prepared in the management of innovation processes to certain risks that may arise and cause failure of the realized innovation projects. If the company can identify these risks as soon as possible and prepare for them, it will significantly increase the success of management of innovation processes in the company.

In solving the defined problem were identified key weaknesses (gaps) and main difficulties of the innovation process management in terms of Slovak companies (empirical research realized by authors). Valued results of this study are also formulated recommendations how to correctly manage innovation processes in a company.

As main conclusions can be mentioned: Management in the company is important in the field of innovation processes management. A key assumption for the successful realization of the innovation processes is the existence of a supportive environment for creation of innovations. For managers can be recommended to implement and use the system of self-evaluation of innovation processes in the company.

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