
Innovation Management and Controlling in SMEs

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Abstract:

This article focuses on the concept of innovation management in small and medium-sized companies, based on the fact that change management in a hypercompetitive environment is a decisive competitive advantage for small companies in comparison with big ones. The author describes innovation management in terms of process management based on management plans and targets and their controlling. Innovation management is considered as system management of processes, products and strategic changes.

Key Words: *Operational Innovation, Product Innovation, Strategic Innovation, M-C Model, Controlling*

JEL Classification: *O31, O32*

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1. Introduction

Innovation management is based on the innovation business strategy that must respect the business strategy, meaning the company's long-term missions, visions and targets. The core of the innovation management is a systematic approach to implementation of changes that should lead to improvement of the products, processes or position of the whole company. The innovation activity is successful only if there is an appropriate response from the market, for example in the form of higher sales or happier customers, in the form of image strengthening and creation of better relations with the individual groups of the company. However, at the same time source options and financial requirements of the company owners and creditors must be respected and the innovation activities cannot endanger the stability of the company. It is not possible to perceive innovations only as an improvement of the products that we offer. We can change the business processes, products, as well as the overall focus and direction of the company. Innovation management, however, must be a carefully balanced controlling system (M-C model).

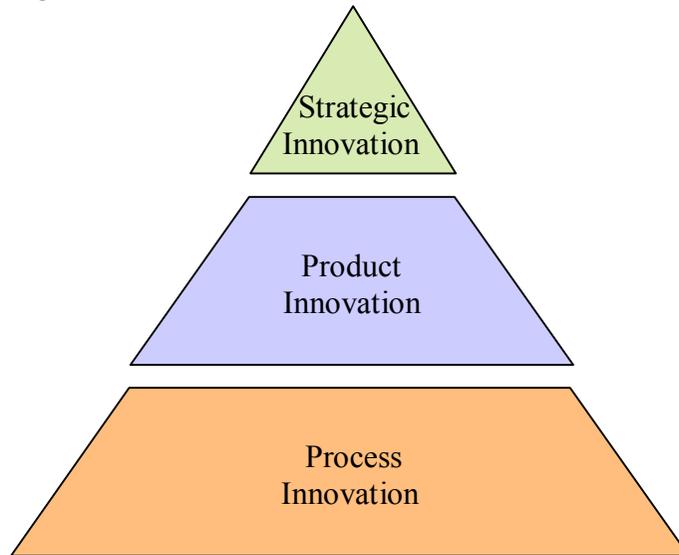
Process management based on the M-C model⁴ can be defined as the Management Control System that includes a comprehensive view of management on the basis of management accounting, management theory and personnel management. It is an interdisciplinary management system where the most important thing is not the interface of the process but the understanding of business management as a whole, mastering planning tools based on research, objectives, visions and missions (management) and control tools based on evaluation of deviations and proposal of risk management measures (controlling). The M-C model shows that a successful business can work only if you manage to grasp all of its processes and understand their interdependence.

2. Innovation Management

Innovation management in small and medium-sized companies can be divided into the management of strategic, product and process innovations. Each of these innovations contribute to the overall success of the company and therefore it is possible to express it hierarchically (Figure 1) when every higher positioned innovation means a higher level of realized value.

⁴ The author of the article has been interested in process management for several years. The term "M-C process management" was first used in the publication by Havlíček K., 2009, "Role of Managers in Company Management", Eupress, Prague.

Figure 1. Hierarchical view of division of individual innovations



2.1 Process Innovation

These are innovations of an operational nature (which is why they are sometimes called operational innovations). Process innovations usually do not bring an immediate competitive advantage but the basis for obtaining the company's long-term position. In principle, it is the optimization of all defined business processes of strategic and operational importance in order to increase efficiency using systematic improving of the activities aimed at cost avoidance or increasing performance. There are many methods that are not used by small and medium-sized companies to the full extent but within the framework of the process changes they should be used at least partially. The following methods can be used as the basis for a process innovative mix: Lean, Six Sigma and TOC (Košturiak and Chal', 2008).

The TOC Method (Theory of Constraints) is based on the search of the so-called narrow space of the process and its subsequent elimination in order to increase its throughput and continue immediately with the search of another weak point.

The principle of **Six Sigma Method** is to increase the stability of the individual processes. The Six Sigma Method has many modifications and was originally founded on six basic principles that greatly expand the activities associated with process innovations - customer orientation, correct information, continuous process improvement, flexible management, distribution based on cooperation, pursuit of perfection in case of tolerance of failure. Problem solving in Six Sigma Model is based on the so-called five steps procedure: Define - Measure - Analyze - Improve - Lead. In process quality management we understand Six Sigma

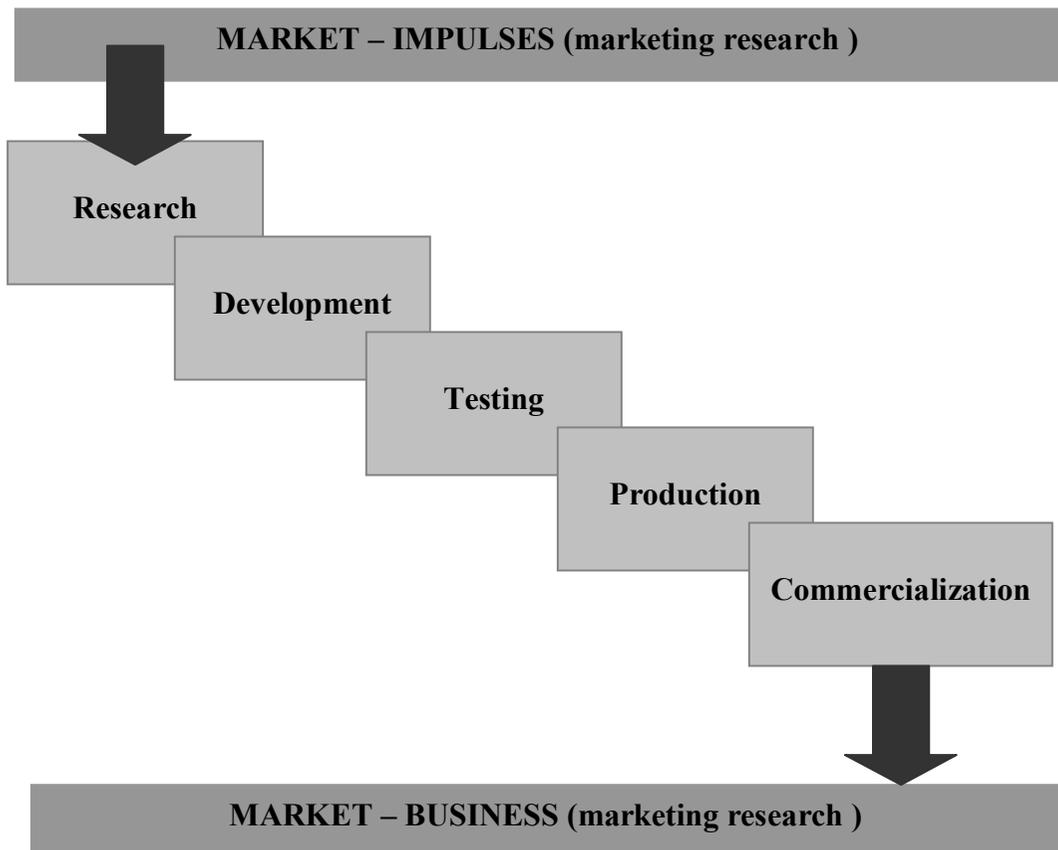
as an activity whose aim is to control quality and resources and consistently meet deadlines.

Finally the **LEAN Method** is based on elimination of waste in and across the individual processes. The point is to recognize all the activities that do not provide any values, from the start of communication with the client and accepting their orders, to product delivery to the destination. The aim is to provide an optimal flow of materials and information.

2.2 Product innovations

To understand the management of product innovations (sometimes the term product innovation is also used, but with regard to the fact that product innovation is more often linked with a specific improvement of the additional services, it is preferable to use the term product, which means both the product and service), one needs to understand the whole process of introducing new products to the market, from research through to commercialization (Figure 2).

Figure 2. Stages of product innovations



Research

Research is the basis of all product innovations and is done on a scientific level, using a variety of methods. We distinguish between basic and applied research and the exact definition is given by the OECD.

Basic research (Korres and Drakopoulos, 2009, Lopez Rodriguez and Garcia Lorenzo, 2011), means experimental or theoretical activities that are primarily focused on the acquisition of new knowledge about the most basic causes of phenomena and observable facts, without, however, addressing the issues of the use of such knowledge⁵ This research does not deal with a specific result. The scientist moves in a wide range of research activities, in some cases, it may also include accidental discoveries motivated by the scientists' curiosity. However, it is virtually indispensable for higher-order innovations and for a truly revolutionary change. It forms the basis of the applied research based on new methods, suggestions and ideas. Investing in basic research does not result in an immediate effect; on the contrary, we often speak about so-called lost investment (the method of trials and errors). However, if the basic research is moving in the right direction and is moved at an early stage into the level of applications and development, there is a chance for important financial effects to be implemented, especially in the long term (such as patenting of methods, procedures, designs or new technologies).

The **applied research** includes experimental and theoretical activities in order to acquire new knowledge, but clearly focused on specific and predetermined targets of use⁶ In fact, this means that the applied research is focused on specific targets and seeks answers to defined questions. It is usually applied by individual companies and commercial sectors. The research is specific. It can be systematically and partly grasped and includes not only the research of scientists but also of people from practice. It either follows up the basic research (we sometimes talk about higher-order innovations - new discoveries, vital product changes in both utility and design) or it results from practice (these are usually basic-order innovations - simple user or design changes not leading to entirely new product groups but rather helping to improve the existing product lines). Basic research is sometimes called exploratory research, while applied research is called targeted research.

Development

This is systematic work that according to the OECD definition uses existing knowledge gained from research and practical experience and aims at the production of new materials, products or devices, installing new processes, systems and services or substantially improving what is already produced or introduced. The company's individual departments contribute considerably to the development and their activities aim at specific targets, in terms of time, technologies or costs. The

⁵ Council for Research and Development, Czech Republic, 2011, www.vyzkum.cz

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development has a fixed order, must be continuously assessed by managers and in larger companies has its own department or division. We usually talk about so-called experimental development that has this label even when drawing from numerous European and relief funds.

Testing

When the development is completed, there is continuous testing and evaluation. Testing is usually done in so-called semi-operational units (these are not the main production facilities that will then be used for mass production, but purpose-built premises on a simpler basis simulating future production and sufficient to test products). The testing itself takes place in several stages and is closely linked to the production and quality department. The testing usually includes **internal tests** (used only for assessment within the company) and **external tests** (the products are already designed for a selected group of customers whose feedback is requested). In the external test phase the marketing department participates in the process in order to negotiate with the customers who participate in testing, the purpose and phases of testing. Cooperation with the market has two effects: firstly we get feedback on usability, ergonomics, design, price, etc., and secondly we demonstrate that we are a reputable company oriented around innovation and interested in the opinions of its customers. This stage also includes the final calculation and preparation of pricing, distribution and communication strategies (Kašík and Havlíček, 2012).

Production

The actual production is done in full operational mode, but initially still in a special mode, especially with regard to final quality. The following systems are fully implemented: QMS or TQM (Havlíček, 2011). Full production launch of the new product is a very difficult process that must be initially continuously monitored and evaluated especially with respect to output quality, customer response, securing of raw materials, compliance with the declared properties of the product and of course with respect to the overall cost and ultimate efficiency. The financial departments those are usually responsible for calculations have to constantly monitor the prices of all inputs and adherence to the time limits. All target indicators are commonly not met in the first stage, however, it is necessary to correct all information communicated to the market (quality and timeliness of deliveries), while the issue of fixed and variable costs and other items affecting the price formation may be initially below expectations (optimization of the management of inputs and the whole production process is sometimes also a matter of a few months).

Commercialization

Commercialization is based on careful preparation contained in the marketing plan that is based on marketing research. It is followed by the preparation of the business plan that must be designed more conservatively and copy the start-up curve of sales of brand-new and innovative products. If these are the elementary

innovation systems (of lower orders) then estimating sales in the business plan is usually easier because the sales of the original product are considered. On the contrary, it is very difficult to estimate sales for brand-new products or higher-order product innovations. The basis is perfect marketing research, customer testimonials from the testing stage and the pilot plant and marketing company readiness to introduce new products on the market (price, distribution and communication strategy). One of the key activities is preparation of a communication plan based on the communication mix (advertising, sales promotion, public relations activities, direct marketing) that must conform not only to the nature of the product, its novelty and ambitions of the company, but that must also respect the territory to which we plan to offer the new products and customer segments. The entire stage of commercialization must be properly timed, both with regard to completion of testing, and the overall position of the company and timing of the product, respecting its lifecycle - stage of the new product launching or stage of the lifecycle of the existing product (Havlíček, 2012).

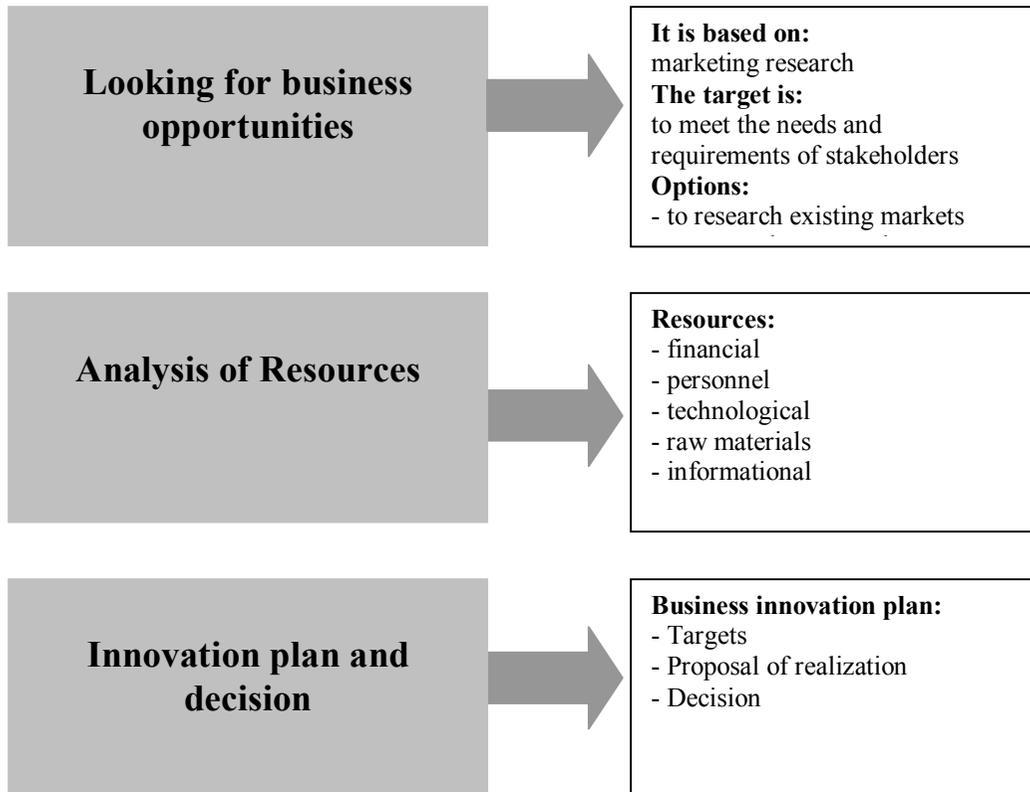
2.3 Strategic innovations

It is an absolutely vital part of innovations whose purpose is to change the direction of the entire departments, companies or groups. The usual target is to create a new business model that will help to increase the market value of the innovator (Pekka-Economou and Hadjedima 2011, Theriou et al., 2011). The strategic innovations are associated with the change of the organizational architecture of the company with a variation of products based on higher orders and fundamental change in the marketing mix, or overall perception of the image of the company. From this perspective, these are strategic changes related to:

- a completely new market or market segment;
- new products or product lines;
- a new business system (from production to distribution);
- increased share in customer costs (Košturiak and Chal', 2008).

2.4 Innovation model in small and medium-sized companies

Briefly stated, innovations are changes in small and medium-sized companies. The management team must create such conditions in the company to permit these changes to be implemented. Controlling is responsible for ensuring that innovative activities are continuously measured and evaluated. The general model of systemic innovation management is shown in Figure 3.

Figure 3. Innovation model of small and medium-sized companies

3. Innovation controlling

Controlling is responsible for ensuring that innovative activities are continuously measured and evaluated. If the innovative procedure or innovative activity does not achieve the expected results it cannot be considered a success, even though it was well-prepared. Likewise, it should be noted that implementation of changes means taking risks and a company that does not take any risks cannot achieve significant success. It is therefore impossible not to risk anything and not to apply any innovations, because it could lead to stagnation.

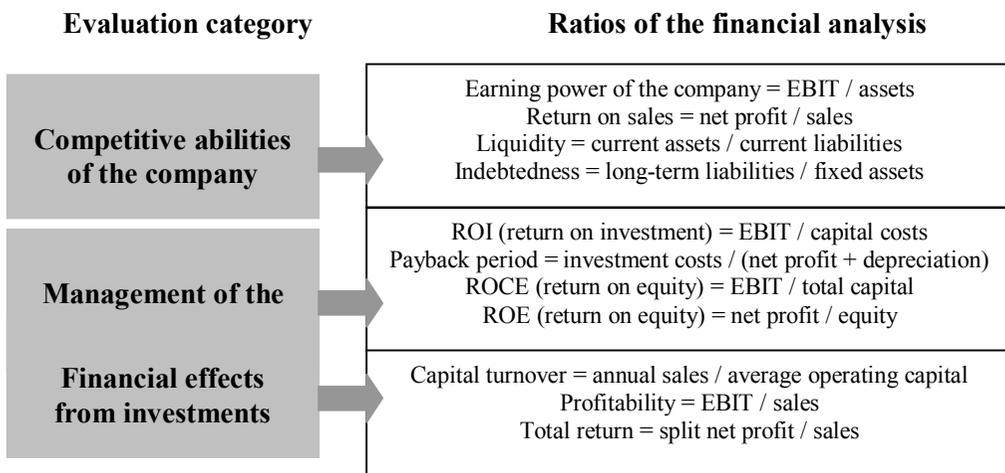
3.1 Strategic innovation controlling

It is based on the management of key financial indicators, creation of common projects, strategic partnership, strategic alliances and long-term investment plans linked to higher-order innovations.

Strategic indicators

With regard to the ambition of the innovation plan there is a continuous follow up of fulfilment of marketing, business and financial targets, all in relation to the incentive plan of the company or the individual departments. As the ultimate success of innovations is usually interconnected with the financial results, it is good to recall the main indicators of financial analysis to assess effectiveness of innovations used (Figure 4.).

Figure 4. Most commonly used indicators of the financial analysis of investment efficiency evaluation (Pitra, 2006)



Choice of strategic partnerships and alliances

One of the most important business activities that goes beyond innovation, however, is what the owners or management consider the strategic dimension. The proper legal or organizational structure, including creation of strategic alliances with scientific research or financial partners, is essential to the success of the higher-order innovations. In the market, there are many forms of partnerships, groups and activities focused in particular on innovations in new technologies. The role of controlling is to ensure external examination in order to decide whether to carry out cooperation or partnership, and if so, when, and especially to create an overview of the benefits of the given partnership.

Incubators

The purpose of incubators is to create some space for new and innovative small and medium-sized companies as a background for beginning the business. These are usually the so-called business incubators that are specifically created by universities, municipalities, counties or public scientific research organizations and

focus on supporting new small companies aimed at the development of products, technologies and services intended in the second phase for the market. The purpose of these incubators is to create for these companies different facilities in the form of research and development laboratories and provide for more small entities shared services in accounting, administration or counselling.

Clusters

Porter defines clusters as local concentrations of interconnected companies and institutions in a particular field. Clusters include a group of linked industries and other entities important for competition. They include, for example, suppliers specialized in inputs such as components, machinery and services and providers of specialized infrastructure. Many clusters also include governmental or other institutions such as universities, regulatory agencies, research groups or trade associations that provide specialized training, education, information, research and technical support.

The OECD defines clusters as networks of interdependent companies, institutions providing knowledge and ensuring communication and customers interconnected with the production chain that creates the added value. It is therefore a concentration of interconnected companies, governmental and academic institutions in a specific industry. They include the entire value chains of activities, from research organizations, academic institutions to supplier, manufacturing and distribution companies. The aim is to create a group of companies that can differ in their activities but that can also in many ways compete. Their shared activities allow the companies to save up and expand more easily into foreign markets.

Technological Parks

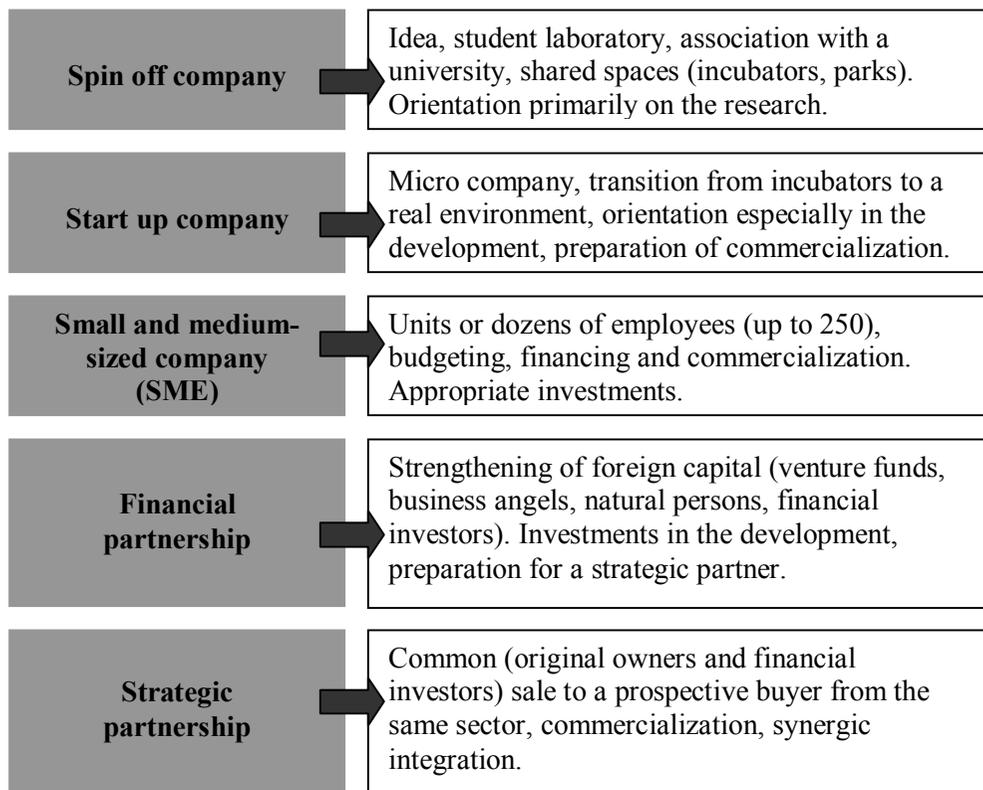
These are in particular scientific and technical parks that fulfil both the role of innovation and incubation. These parks are usually specific institutions that receive companies from the small incubators and that devote to the base for more business entities, especially in terms of technology transfer (the process of transferring knowledge that enables innovative products, manufacturing, working and testing methods and services) related to innovation management in companies belonging to the parks (Havlíček, 2011). The scientific and technical parks are often financed from structural funds and should serve as incubators for the creation of innovative companies, especially in progressive sectors. These are usually very specific facilities set up to support the innovation potential of small and medium-sized companies, but they may even be virtual.

"Spin off" and "Start up" companies

The new small innovative companies that in the first phase of its existence mainly use the facilities, laboratories and results of the research and development of the universities or research organizations are called "spin off" companies. These are very often companies established by students and young scientists and are therefore

often part of universities and parks. They are fundamental to the functioning of both incubators and scientific and technical parks. In the advanced stage, but still at a time when the company is not commercially self-sufficient (there are no sales), usually in the phase of the applied research and development, these entities are called "start up" projects. This designation clearly communicates to potential investors that it makes sense to invest in them. When the company acquires the status of an SME company it is able to start its first commercial activities. If this is a project for which the small and medium-sized company ensures sufficient resources (financial, personnel, marketing), the project remains as an economic activity of the small company and if an innovation becomes so attractive and demanding that it cannot be developed in the small and medium-sized company, the company looks for a strategic partner at a higher level in the form of venture capital, strategic or financial investors.

Figure 5. Stages of the development of highly innovative companies



3.2 Operational innovation controlling

It focuses on short-term innovation targets, the concept of organization of the whole innovation process, financing and operational risk management. It should eliminate the risks associated with immediate innovation management, particularly with regard to the roles, authorities and responsibilities of the individual departments and managers in the innovation process.

Operational risks are associated with the direct operation of the business immediately following the innovative activities. The main risks in relation to the internal processes are divided into three categories (Pitra, 2006):

Technological risks:

- incorrect identification of needs and market requirements;
- errors in the concept of the research and in the choice of technical solutions;
- poor choice of distribution channels.

Operational and commercial risks:

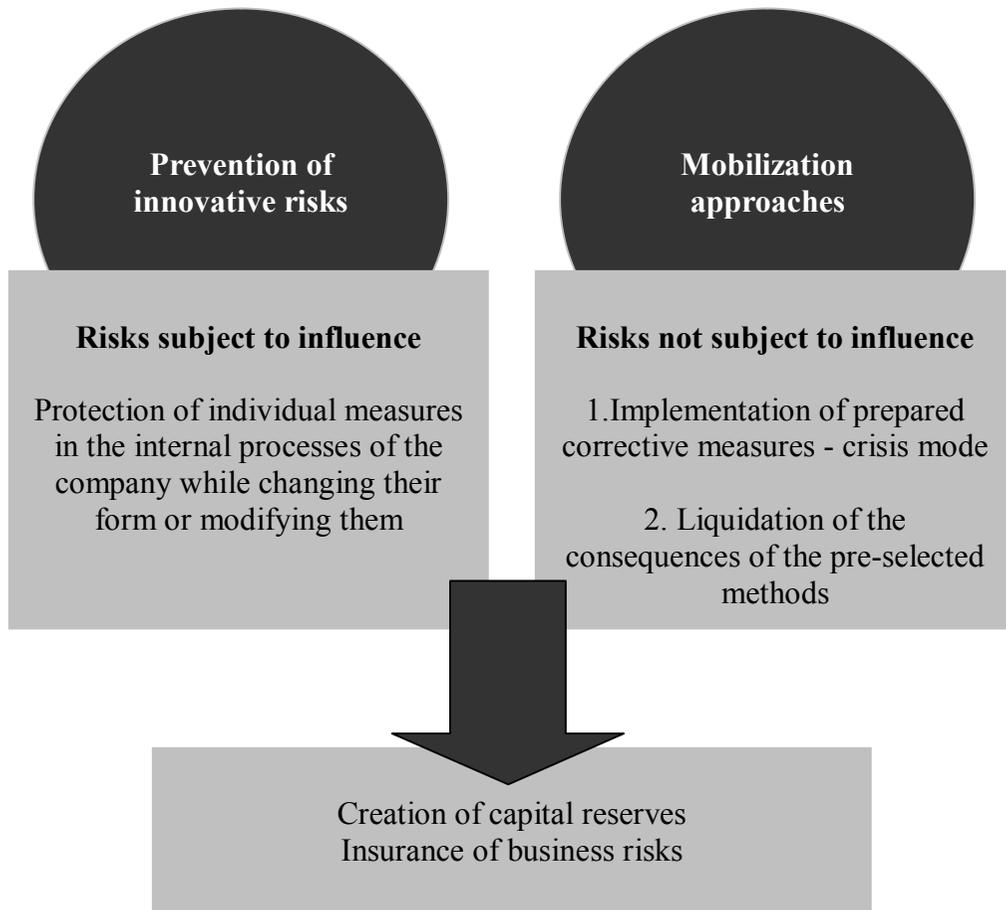
- inadequate production and working practices;
- unreliable subcontractors;
- incorrect external communication;
- inappropriate pricing policy.
- poor choice of sellers.

Financial risks:

- underestimation of the possibility of insolvency of customers;
- incorrect setting of exchange rate and inflation risk;
- lack of preparation for legislative changes with regard to the taxation of income and tax payments.

Zdeněk Pitra also identifies the main steps leading to elimination of the above-mentioned operational risks. They are divided into two steps: activities aimed at prevention of risks resulting from innovations and minimization of already existing problems associated with innovative projects (Figure 6).

Figure 6. Elimination of innovative operational risks (Pitra, 2006)



4. Summary

The article outlined the main areas of innovation management divided into change management of processes, products and strategies that are generalized in the innovation model, applicable in most small and medium-sized companies. The authors understand the innovation plan as a tactical document based on the three pillars of operational plans: search, analysis and plan. Given the importance of innovation, innovation controlling is described in particular at the controlling strategic level in relation to strategic financial ratios. In a hypercompetitive environment the innovations of small and medium-sized companies become the crucial activity that decides their survival. Process innovation management and the evaluation of its efficiency and time are key competitive advantages in relation to big companies.

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