

# PROPOSAL OF MODEL FOR CREATING INNOVATION STRATEGY

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**Abstract:** *The process of creating an innovation strategy is a complex process. The contribution deals with the process of creating an innovation strategy. It gives new insights in analysis of environment and strategy formulation. The contribution provides a comprehensive look at the creation of innovative strategies using elements of the proposed expert system. Part of the article is also recommendations for successful implementation of innovative strategy in the enterprise.*

**Keywords:** *Innovation Strategy, Expert System, Innovation, Management, Innovative Potential, Strategic Management.*

## 1. Introduction

Innovations are currently undertaking a fundamental prerequisite of competitiveness. The economic crisis forced most businesses to savings in all business areas. On the other hand, it should be noted that the economic crisis for some time will gone and come again revival the economy and re-distribution of markets. Successful companies are the ones that have implemented an innovative strategy to invest in R & D and innovate. Innovation is regarded as a key business process, it means they are trying to achieve certain businesses a competitive advantage. The basic precondition for the creation and use of innovation in the enterprise is well worded and implemented innovative strategy.

Aim of this paper is to propose a model of innovative strategies focused on the area of environmental analysis, business and innovation strategy formulation. Provide to senior managers with a device as recommendations for smoothly implementing innovative strategies in the enterprise.

## 2. The definition of innovation strategy

Among the professional public is currently debate about definition of innovation strategy and allocation of areas of operation. Kováč (2007) sees innovation as a strategy for determining long-term fundamental business objectives and determines the activities and resources for achieving these goals. Orientation objectives are focused on timely response to changes in signalling the need for innovation. According to the innovation strategy must be based on variation, long term, systematise, the time factor and the concentration of resources and activities. The above-mentioned variability of innovation strategy highlights Zaušková (2006). Innovation strategy is often called the scientific literature and other attributes, such as scientific and technical, development-based innovation or research and development strategy. Zaušková (2006) gives some attention to the fact that the scope of the adjective (in the context of innovation strategy) may be wider, respectively narrower. According her the scientific and technical strategy is for review and selection of scientific and technical objectives, as well as the methods and ways to achieve these goals. The strategic objective scientific and technological development plan is considered an undertaking which significantly affects the

individual sites and changing reproductive process, through scientific and technological activities. However, R & D strategy is focused only on two main areas, namely the area of product innovation and manufacturing process of innovation. Strišš et al. (2009) understand the innovation strategy as a complex scientific-analytical and implementation tool oriented to the continuous process of advancement.

Based on a thorough analysis of domestic and foreign literature, we can proceed to the following definitions of innovation strategy:

*"Innovation strategy is innovative business approach to the choice of objectives, methods and ways to fully utilize and develop the innovative potential of the enterprise. This is the direction of its boundary, which determines the potential of innovative strategies."*

*Innovative potential of the strategy* can be defined as the rate of innovation strategy, which would be attained in the optimal utilization of all sources of innovative strategies. The level of innovation potential strategy while depends on the level and quality of the individual components of innovative resource strategies.

*Innovative sources of strategy*, we understand the opportunities, skills, knowledge, experience, invention and innovation that are available to businesses, or are unable to obtain in good time. Innovative sources of strategy consist of four basic, interrelated, modules, namely:

- Bank of inventions,
- Bank of innovative opportunities,
- Knowledge base,
- Bank of innovation.

### **3. Current approaches to developing innovative strategies**

Creating an innovation strategy is a complex process. Various authors state many variants of innovative strategies. Sabadka and Kováč (2004) consider innovation strategy as an integral part of an overall strategy that promotes innovation objectives (growth in value, potential for innovation, production and profitability, improving the competitive position ...). The emphasis placed on its ability to address the removal of identified bottlenecks, use the specified opportunities and general trends in innovation (the implementation of new technologies, leading to a loss in response to the innovation cycles of products, ability to work in global supply networks ...).

Rudy (2004) focused their attention primarily on the technology innovation activities, from which depend crucially on the scope, speed and quality of implementation of innovative ideas. It notes that developing innovative strategies prior system relatively complex and time-consuming search and decision-making activities, which cannot come without a vigorous use of computer technology. This will help to choose the level of available alternatives. The process of creating innovative strategies divided into three main sections:

- Clarification of innovative ideas,
- Formulate a vision of senior management,
- Choice of effective ways of implementation.

Bartók and Ješka (2006) deal with the processes of innovation and their implementation in innovative strategies. Their model of innovation management and strategic management developed Kadár and Vida (2007). According to them the process of creating an innovation strategy consists of the following elements:

1. Mapping and assessing the impact of ambient operating system (socio-cultural, economic, technological, political and legislative implications);
2. Analysis and evaluation of the internal environment (the products' own resources, structure and development);
3. Formulating competitive strategies (high productivity, quality and customer satisfaction, profit maximization, organizational growth, improved market position);
4. Elaboration of implementing programs and projects;
5. Evaluation of the effectiveness of innovation.

Šimková (2006) highlights the need to consider a range of factors. According to her the aim of creating of innovative strategies is find a balance between the potential for innovation, enterprise and all relevant factors of the internal environment. The important factors to be taken into account, it:

- Market opportunities, industry attractiveness and competitive pressures,
- The best potential sources of useful business,
- Threats to the enterprise,
- Personal values, vision of senior management,
- Social, political, regulatory, ethical and economic aspects of the internal environment of business,
- Corporate culture and business philosophy.

When creating an innovation strategy attaches utmost importance to the analytical part. According to the process of creating an innovation strategy consists of an analysis of interest groups:

1. Analysis of the external environment (Step analysis, economic characteristics of the sector, analysis of industry dynamics, strategic maps, analysis of competitors, analysis of industry attractiveness),
2. Stakeholder analysis (opportunities and threats, strengths and weaknesses),
3. Internal environment analysis (evaluation of existing strategies, analysis of results in functional areas, vulnerability analysis, Space analysis, competitive analysis, key success factors).

#### **4. Motion model of innovative strategies**

The diversity of approach for creating innovation strategy refers to the fact that the innovation strategy as a system of work with innovation in the enterprise is evolving. It is possible to create a relatively universal model that will ensure successful implementation and follow-up of innovative business strategies.



#### **4.1. Strategic objectives of innovation strategy and its link to corporate strategy**

Innovation Strategy contains basic business objectives of innovation, provides activities and resources to achieve them. A successful innovation strategy has to have a lot of variants i.e. is processed in the variants, which take into account past, current and expected future developments. The long term, takes into account all relevant factors, operating a business as well as the time factor. To realization of innovation strategy is needed to ensure all available resources.

Innovation strategy is a summary of the strategic decisions on which are managed and carried out innovative activities in the enterprise. Based on the innovation strategy are made more decisions on the information work and knowledge to support innovation. The aim is to create a distinctive innovation strategy for the enterprise. The innovation strategy must be linked with corporate strategy and other business departments, particularly the department of marketing and information technology.

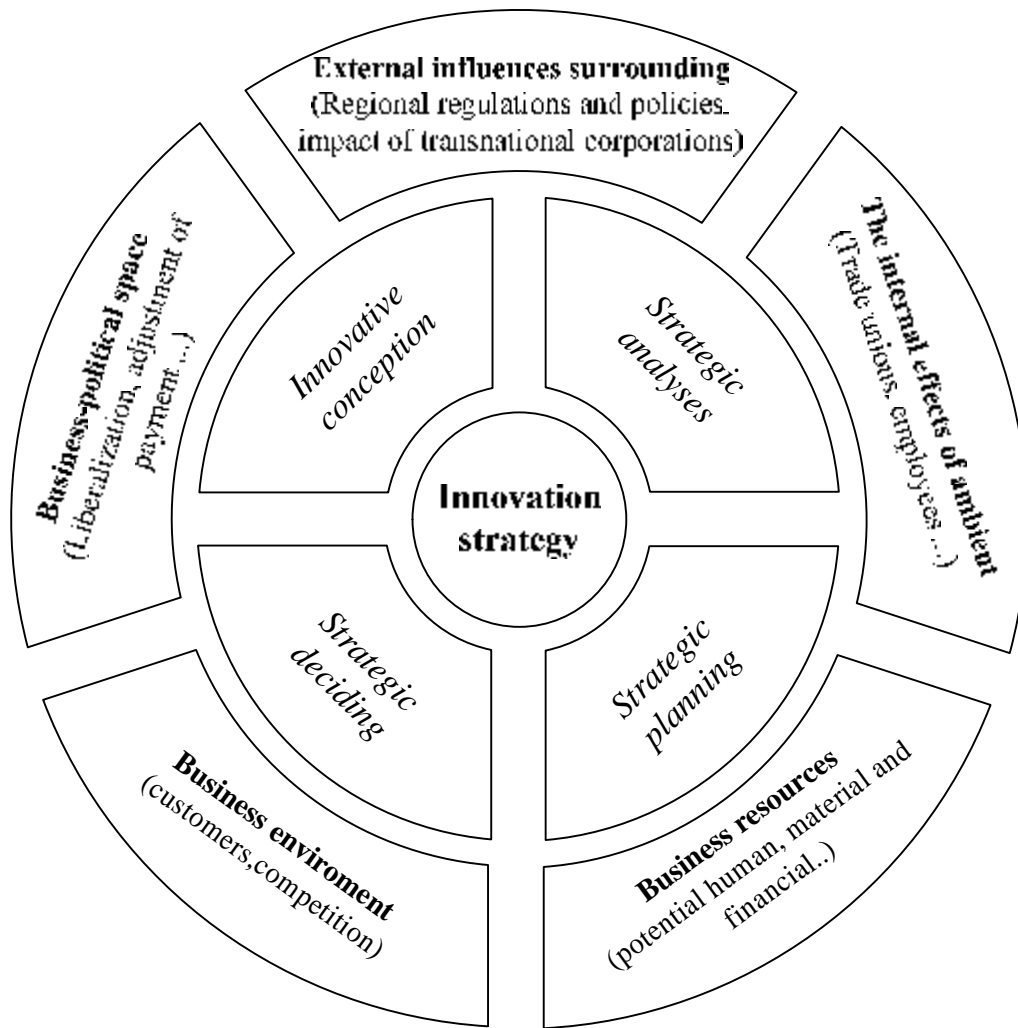
Innovation strategy determines to what extent and how the company seeks to use innovation to meet its business strategy and improve its performance. Innovation strategy in order to fulfil its objectives, the company must first ensure climate for innovation. Course is to define key aspects of the development of innovative business activities and assigning priorities. The enterprise must ensure effective collection and sharing of information and knowledge to support innovation.

The first step in creating an innovation strategy is to review current business strategy. To be well-innovation strategy is essential that business managers are familiar with the detailed corporate strategy.

It is important that an enterprise innovation strategy regularly reviewed for their timeliness. Assuming that the company finds that his strategy is no longer current and does not fulfil its function, it should be a change or innovation strategy to create a new innovation strategy. The innovation strategy review must occur whenever a change in corporate strategy. The innovation strategy must under all circumstances is to promote corporate objectives. At the beginning of the creation of an innovation strategy is needed to clarify the procedure, which will be created based innovation strategy and its innovative activities undertaken by the company. Innovation strategy is closely aligned with corporate strategy, therefore, must reflect the basic features of this strategy.

#### **4.2. Analysis of business environment**

The role of strategic management in developing and implementing innovative strategies are irreplaceable. Preparation of innovative strategies must be purposeful and must be based on an analysis of internal and external environments, planning and innovative design (Fig. 2).



**Fig. 2: The base of innovation strategy (source: own elaboration)**

In the area of strategic analysis and planning is essential that the company make full use appropriate methods of strategic management. The subject of strategic analysis is primarily scientific and technical capabilities enterprise, competition, the manufacturing company's potential (the potential of human, material and financial resources). Strategic analysis gives the answer to important questions, such as the existence of his original research and development enterprise, the existence of new opportunities for the emergence of innovation, the existence of creative potential for the emergence of inventions and the like. This information significantly affects the process of creating an innovation strategy.

Before the creation of innovative strategies in business should be audited current situation. An audit includes identification and analysis of human potential, competitors, partners, customers and business needs to create innovation.

Innovation strategy is fundamental to the creation and implementation of innovation. Analysis of initial position of a company can be divided into two basic analyses:

- Analysis of environmental and market (external analysis - external environment company),

- Analysis within the company (internal analysis - the internal structure of the enterprise).

Analysis and evaluation of baseline status of the enterprise is not only to identify vulnerabilities and threats, but also to describe the strengths and opportunities. The analysis is the business environment, i.e. particular customers and competition. The analysis should focus on four main areas, namely market environment and internal innovation processes, research and development in business, information systems used in business to support the transfer and sharing of innovative ideas, ideas and suggestions. For purposes of analysis, starting position of a company can use the method of SWOT analysis.

The outputs of the current situation analysis carried out within the enterprise must be taken into account when developing an innovation strategy. Identified weaknesses have to be removed in the short run, to the company be ready to carry out innovative activities. Otherwise, could greatly affect the benefits of innovative activities undertaken. Careful analysis avoids problems that would arise during the implementation of innovative activities.

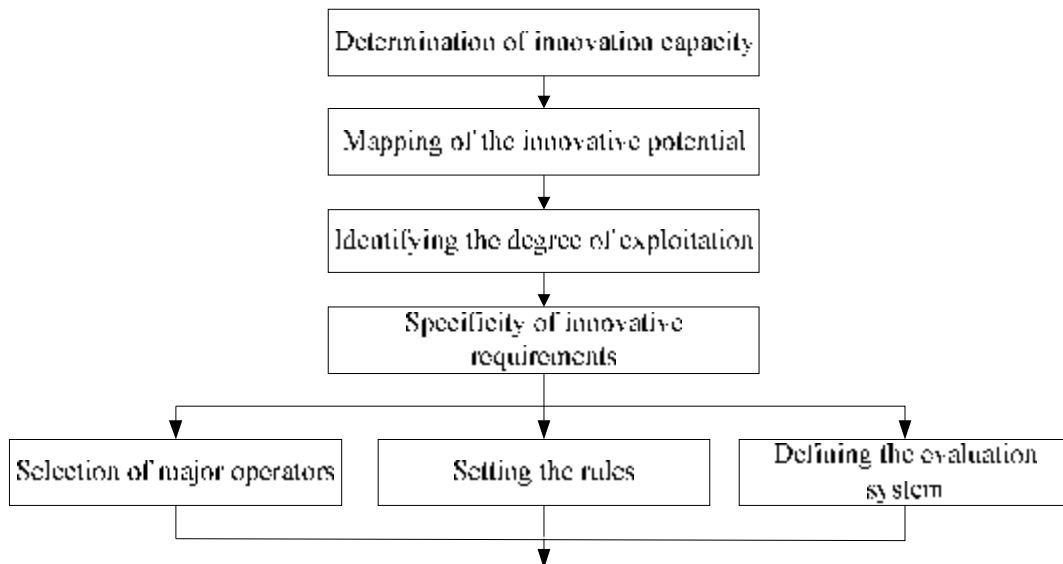
The analysis of the source position of a company may be based on a broad methodological apparatus of strategic management. This is particularly the forecasting method (expert, simulation, extrapolation, prediction type scenarios), conceptually the methodological tools (SWOT analysis, BCG matrix, the matrix product - technology, map of project risks, SPACE analysis STEEP analysis, Porter analysis ...) and innovative graphs (method S-curves, J-curve method, the method of "gap analysis").

The above audit in the company focuses on a detailed analysis of key innovation processes. Individual processes are rated according to their content and organization. A detailed analysis must be consistent with the planned innovation strategy. The output is a diagnosis describing the current situation within the company. It aims to identify weaknesses in the company's organizational structure, information system and communication. It may come as to the following conclusions:

- Insufficient information,
- Isolated innovation processes,
- Not innovative business climate,
- Poor communication between staff involved in the creation of innovation,
- Inefficient work with knowledge across the enterprise.

Analysis of internal environment includes the implementation of the following (Fig. 3):

- Identify innovative capacity,
- Mapping the innovation potential,
- Identification of current levels,
- Innovative specification requirements:
  - § Selection of the main operators,
  - § Setting rules,
  - § Defining the evaluation system.



**Fig. 3: Analysis of internal environment (source: own elaboration)**

In the first step, the enterprise must determine its innovation capacity. It consists of the sum of knowledge, experience, resources, assets and managerial capabilities and skills that are available to businesses, or is unable to obtain in good time. This is the basis for creating an innovation strategy. Then there is a mapping of innovation potential, the rate of innovation means business, which may reach the optimal utilization of all components of innovative capacity. In the next step, the enterprise must assess and identify the current level of use of innovative capacity. This analysis will provide an accurate picture of the possibilities for innovation, which in turn translate into innovative specification requirements. This is particularly the selection of the main operators, i.e. areas that are undertaking in terms of its vision and mission of interest and will form the substance of innovation strategy. There may be innovative in those areas where a company makes in terms of innovative capacity using the best results. A second area which needs to be addressed is the establishment of rules making innovation strategy. The rules will work proposed expert system. An important part of innovation is the definition of the requirements of the assessment. The company must be clear about what criteria to assess the chosen innovation strategy, respectively. According to which attributes will monitor its implementation over time. These attributes will form the basis for continuous evaluation of innovative strategies that will signal the current innovation strategy and the demand for its updates.

#### **4.3. Strategy Formulation**

The most important process of creating an innovation strategy we consider the formulation strategy. The process to generate different variants of innovation strategy, their analysis and evaluation according to established rules and criteria specified. Based on the performance of previous activities can proceed to selecting an appropriate solution, which represents the optimal scenario for an enterprise innovation strategy. Strategy formulation process is marked by more intensive calculations, occurring primarily in the selection of appropriate solutions. Even generating different options strategies requires innovative use of information technology. For subsequent evaluation of the various options need to be intermediate results stored in a space for confrontation and the subsequent comparison with actual outcomes. It should be based on more data and knowledge, which must be stored in transparent database. This will



prevent the emergence of common situations where there is any confusion, searching, lost and resting mainly due to absence of awareness of their existence within the enterprise. All of these assumptions and requirements for successful development of innovative strategies can be achieved by introducing expert system that will provide senior managers with the detailed information needed for decision making.

Based on an analysis of the literature on the creation of knowledge and expert systems ([NÁVRAT et al. 2007]; [SPALEK et al. 2005]; [LIDAY & KELEMEN 1996]), and after careful examination of the issue of innovative strategies ([HORŇÁKOVA & ZAUŠKOVÁ 2008]; [DUPAL & MOLNÁR 2002]; [KOVÁČ 2007]; [TIDD et al. 2007]; [DUPAL et al. 1997]; [ZAUŠKOVÁ 2006]; [ZAUŠKOVÁ & LOUČANOVÁ 2008]) suggest that the expert system to work with skills necessary for creating an innovation strategy consisted of following basic parts:

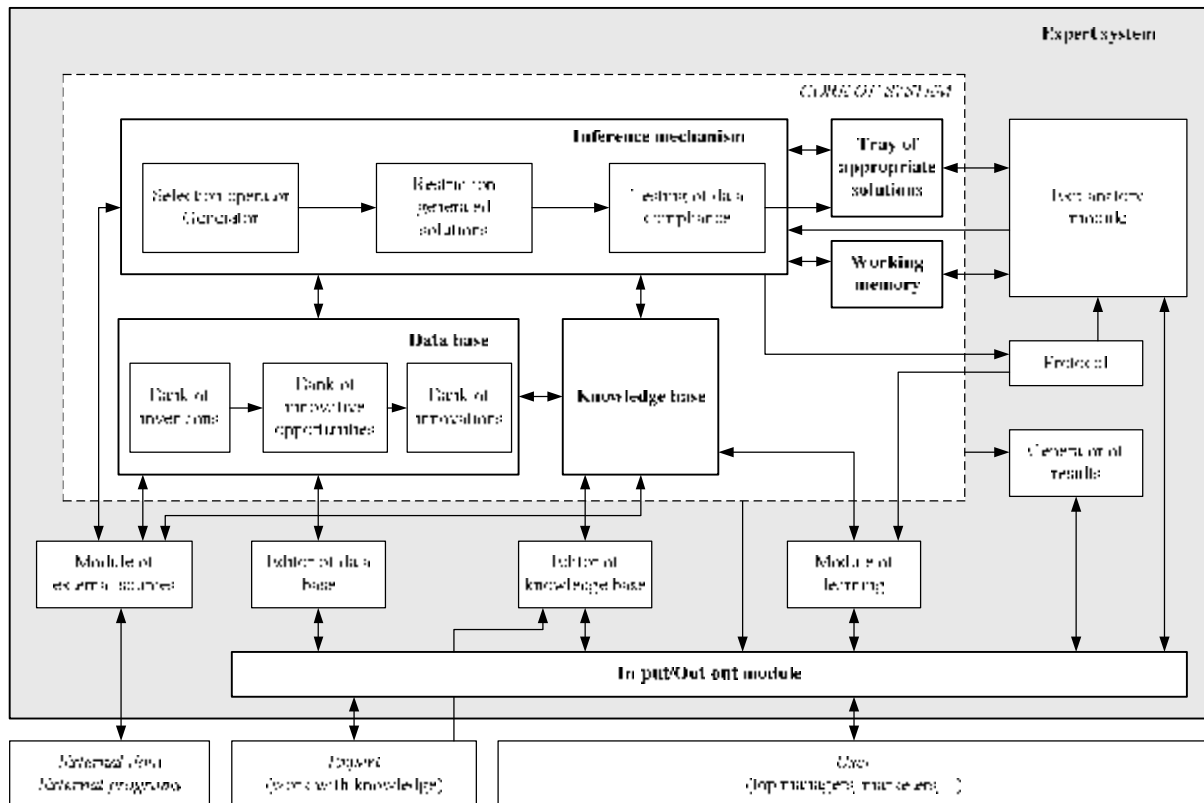
- The core system (knowledge base, data base, working memory, and storage mechanism inference appropriate solutions),
- Input / output module,
- Explanatory module,
- Protocol,
- Other components of the system (knowledge base editor, editor, data base, the module learning outcomes generator module external sources.

Figure 4 shows the architecture of the proposed expert system for dealing with innovation in the development of innovative strategies. It is a complex system whose components must interact with each other and provide needed expertise in real time. The main objective of the proposed expert system will achieve the best response to real data on the innovation, thereby ensuring high quality decision-making in the innovation strategy.

The basic prerequisite for the successful operation of the proposed expert system is the existence of actual knowledge base module and the module data base. Liday and Kelemen (1996) emphasize the need to strictly distinguish the data structure representing a valid and generally accepted knowledge from the data structure. The reason is the different requirements of disclosure and manipulation.

The proposed expert system will act two bases actors: the user and the expert. User is a person who, in practice the expert system uses the skills of working with innovation and creation of innovative strategies. These are especially the senior managers and marketers. Expert knowledge is a source of innovation and innovative strategies.

*Knowledge Base* focuses on expert knowledge gained. It provides space for the collection of all knowledge that can be used in the innovation process. The main purpose of the knowledge base is designed for an appropriate mix of skills into a successful innovation. To deal with the knowledge seeking knowledge, which requires management to further progress in addressing the problem? Knowledge base must be designed to allow efficient access to required knowledge and also provide the greatest store of knowledge.



**Fig. 4: Design of an expert system to work with innovation (source: own elaboration)**

*Data Base* contains all the unique information relating to innovation. It consists of Bank of inventions, the Bank of innovative opportunities and the Bank of innovations. Bank of inventions is a space for the search, creation, evaluation and saving inventions (suggestions, ideas, and thoughts) that may participate in the next phase in creating an innovation strategy. Bank of innovative opportunities is a space to store and work with the identification of innovative opportunities. It also serves for storage of innovative opportunities for the company are not immediate importance. The bank keeps all the innovation created by innovation and creating an environment for their effective management and conversion into a successful innovation strategy.

*Working memory* provides space where they are stored intermediate data solutions and a timetable to work to solve. History of the solution is imposed by the Protocol, which the explanatory module then uses for explains.

*Input / output module* provides an interface between knowledge-based system on its surroundings, which is mainly represented by the top management and staff involved in shaping innovation strategy.

*Explanatory module* clarifies, explains and justifies the decision which the expert system output. Managers and marketers acquire the necessary justification for the final solution in the form of chosen innovation strategy.

*Inference mechanism* allows finding the required knowledge in knowledge base, data base and using them to develop innovative strategies. It can derive from these bases for further information and knowledge. Its work is based on a knowledge base and data base on which influences the choice available to operators, limiting the number of tested solutions proposed

generator and controls compliance testing solutions generated with the actual data. One of the important outcomes of inference mechanism is *tray of appropriate solutions*. This module contains the appropriate solutions, which are rated according to their fitness level. They then enter into explanatory module, through input / output module which gives to user (the senior manager or marketers).

*Editor knowledge base* provides a constant update, supplement and expansion of knowledge base. The most common reason for these changes is acquisition of new knowledge that can help in the process of creating an innovative business strategy. On the other hand, the manager can identify errors, which must be removed (for example, rules for creating variants of an innovation strategy, importance of amending the innovation process ...). The same principle is based on the data base editor. There may be a reason such as incorrect identification of changes in ideas and their subsequent translation into innovative opportunities...

An important part of the proposed expert system is a learning module. Its main objective is to promote acquisition of knowledge. Ensures that is always based on the current situation. Learning outcomes are re-stored in a knowledge base and used for create innovation strategy of company in the future.

*Generator of the results* summarizes partial results in a reasoned and integrated whole, without unnecessary information, the requested form and intelligible form. His contribution is in providing effective, efficient, differentiated, comprehensive, and timely performance information, especially serving for deciding on the choice of innovation strategy.

*Module of external sources* provides communication of the expert system with their environment. The main activity of this model is to work with external data and work with external programs. Inference mechanism in case of request certain data will search in the data base. If there in not find the required information, the management is submitted to module external sources. He begins to search external data source. In case of found of required fact it is allowed insert it into the data base and send back the management to inference mechanism. Likewise it does even in case of necessary expertise. As inference mechanism doesn't appear requisite knowledge in the knowledge base, submit the management to module of external sources. It begins to search external data source. If successful, will embed the acquired knowledge into a knowledge base, if fail then it turns through the input / output module for expert, who knowledge supplemented by the necessary knowledge base editor. Then handed back control to inference mechanism.

## **5. Recommendations for successful implementation of innovation strategy**

For the successful implementation of innovation strategy is essential to avoid more potential problems. Insufficient development of an innovative program resides a common problem in the implementation of innovative business strategies. Managers are too reliant on technology. In order to implement innovative business strategy successfully, it must have a sufficient basis for innovation processes, innovation, innovative resources and information flows. If the company does not pay the necessary attention to this work and during creating an innovation strategy based on insufficient documentation, then the innovation strategy in the enterprise is doomed to failure. Managers undertaking may be encouraged to focus on detailed analysis of the current situation in the enterprise and to understand the role of technology in implementing the innovation strategy. It is also necessary to good map innovative potential and the right specify the innovation requirements, correctly configure the system and evaluation system of rules.

The problem occurs when defining the strategic goals, which the enterprise wants to achieve in field of innovations within of frame the innovation strategy. Most for enterprise is not clear and understandable, which seeks to achieve, respectively what are the possibilities of using its innovative potential. In this situation it is necessary to correctly understand the concept of venture innovation potential, realize the potential benefits and managed to translate these requirements into the objectives. The most common cause of failure may be lack of vision on the business innovation potential and possibilities for its use. Managers undertaking may be advised to properly understand the concept of innovation potential (good knowledge of the issues is reached by studying literature, advice or relevant professional training), to clarify the situation, where the company wants to get the implementation of innovative strategies, understand the expected benefits and the way leading to their realization and developed a common vision.

One frequent problem is the *elimination of human error* in making innovation strategy. Employees who are not involved in the creation of innovative strategies have not received sufficient information on the Innovation Strategy targets are not properly informed of the intentions of the company's innovation, some activities may act passively. Managers may be advised to ensure regular communication with staff to create good climate for innovations. Top management should allow employees to participate in developing innovative strategies to welcome their ideas and explain the importance of innovation strategy. Of course, it is necessary to ensure staff awareness of the individual steps of the implementation of innovation strategy.

In some cases, it may lead to erroneous automate previous innovation. Business managers can identify and recommend innovative continuous updating of innovation process and emphasis must be placed primarily on the processes that are in direct connection with the work of innovation. Managers must identify the missing processes. Sufficient attention must be paid to analyzing the current state of innovation. As a suitable tool for this analysis can help managers create their own business model innovation management relations (more [BARTÓK & JEŠKA 2006]).

## 6. Conclusion

Currently, companies seeking to ensure its competitiveness through innovation. These activities are necessary for survival and growth. Long-term successful business activity affects economic performance and thus the development and innovative opportunities of the enterprise [MYŠKOVÁ 2003]. Significantly affect its performance, market position and market power. To the business conducted effective work with innovation is necessary to adopt and implement an innovative strategy.

The proposed model for the creation of the innovation strategy leads to new insight particularly in the field of analysis of internal environment and business strategy formulation area. The main thrust business should be to create an innovative corporate culture. It should be noted that the corporate culture significantly affects the formation of an innovation strategy and its implementation. Creating an innovation strategy will require a change in the organizational structure of the enterprise. The innovation strategy must be planned and formulated in writing. On the other hand, it should be noted that the innovation strategy, if successful, not only plan which should be implemented. It has symbolic value. It is something that staff provides information about where the company seeks innovation, what motivates

employees, what is the meaning of their work. In this sense, the innovation strategy is in particular culture.

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