VILNIUS UNIVERSITY

Gintaras Binkauskas

MECHANISM OF SHAPING INNOVATIVE POTENTIAL OF A UNIVERSITY

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VILNIAUS UNIVERSITETAS

Gintaras Binkauskas

UNIVERSITETO INOVACINIO POTENCIALO FORMAVIMO MECHANIZMAS

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INTRODUCTION

Topicality of the problem

Large resources of finance and labour do not suffice if countries want to aim high in the global race of competitiveness. The significance of research and technology development (RTD) is being increasingly accentuated both in countries' short-term and long term development programmes and in strategies of countries' economic unions. The European Union has stressed that knowledge and the ability to gain knowledge will be the main factors in the ever-changing global economy of high- and medium-technologies (European Commission, 2006).

The mission of universities as the main institutions of knowledge generation has been education and science; however, during the last two decades, yet another mission of universities has been developing, which emerged in response to global processes around the world, the ever-changing environment, internationalization of studies and science as well as increased competition. Society, government and business want to see universities as their partners directly and more explicitly contributing to the development of economy and society. This contribution is made through social contracts between the state and universities, or through universities stepping into a new phase of becoming entrepreneurial universities as a result of relations among the state, industry and science, which is also referred to as the Triple Helix model. The third mission of an entrepreneurial innovative university says that universities are subject to conditions of global competition for students in the so-called "mass market of higher education"; moreover, they are encouraged to conduct research for practical application to gain benefit from it. Louis et al. (1989) introduce five ways of how the academic community can transfer innovative and advanced products and services to business. This may be done through consultations, funded research, research companies, patents and licenses as well as start-ups and spin-offs. There is

also a conventional knowledge transfer through graduates working for business enterprises, research institutions or public entities.

In order to start, encourage, strengthen and control the innovative process, which emerges in universities alongside teaching and fundamental research, a challenge is met to create a proper innovation management system able to shape and strengthen the existing innovative potential of universities. In order to survive in the global market of teaching and science, universities will have to be flexible, their organizational culture will have to encourage and be open to innovations, and they will have to consider changes as opportunities rather than threats.

Lithuania, without large financial, material and technological resources, has faced global challenges unprepared. Labour emigration, foreign direct investment cuts and withdrawals during the last two years have not contributed to the competitive ability of the Lithuanian economy. However, technologies, innovations and knowledge are able to change the economy of the country. It is important to know the extent to which the country's scientific potential is capable of satisfying the needs of business and whether business is ready to cooperate with the country's research institutions, although it has an alternative to purchase and adapt the existing technologies and innovations from abroad. Even politicians today are setting universities the tasks of more clearly and substantially contributing to the advance of the country, paying more attention to innovations and maintaining entrepreneurial culture. Universities have a huge knowledge potential, which is not fully taken advantage of due to tight restrictions and obstacles (EC, 2005).

Based upon the typology suggested by Cameron and Quinn (1999), Lithuanian universities of the post-soviet period could be rated as relatively inflexible hierarchical structures where neither the legal base nor governance traditions or internal university culture have promoted and fully supported entrepreneurialism and innovations among scientists. University funding and the assessment procedure of scientific production put an emphasis on the number of research publications, whereas little attention has been paid to applied research, cooperation among

universities, ordered research for business. In 2007, the Lithuanian Government took the decision to establish integrated science and business centres, and in 2009 the Law on Higher Education and Research was passed, which provided for the change of a university status from a budgetary to a public entity, thus extending to universities the right to dispose intellectual property. As a result, universities were offered considerable opportunities to commercialize research results, to promote cooperation with businesses, as well as to encourage developing entrepreneurial and innovative ideas among scientists. However, the implementation of the third mission of universities, i.e. innovations and entrepreneurialism, which was stimulated by global competition and initiated by politicians, is struggling its way to Lithuanian universities.

Scientific problem and the level of its research

The beginning of innovations as an object of research is related to Schumpeter's work of the 1930s, which mostly considered the efforts of an individual businessperson-innovator to produce new goods or services which turn into a driving force for economic growth. Research and innovations of the 1930s and 1940s were based on a theory that the entrepreneur is the driving force of innovations. The description of innovations and innovation research was focused on their separate components and on individual management of innovations. The next stage in terms of the approach to and the understanding of innovations was the 1950s and the 1960s when the organizational level of innovations emerged alongside individual innovations and an individual innovator. An attempt was made to find sources of innovations inside an organization, to take advantage of its competences and, through a close pursuit and stimulation of innovations, to make the RTD management efficient. An organic type of organization, proposed by Burns and Stalker, was considered as a prototype of an innovative organization.

Other researchers, e.g. Kanter, Drucker, Freeman, were also developing definitions and research of an innovative organization. Two di-

rections, mostly related to the object of this research, are to be distinguished: research of innovation process and management systems (Griffin; Kamoche and Cunha; Bessant and Tidd) and research of the innovation process environment.

The research of the innovation process environment analyzes issues such as leadership (Borins, Carneiro, Ducker, Isaksen and Tidd), employee motivation, organizational climate or organizational culture, creativity (Amabile, Amar, Ahmed et al.; Ekvall and Ryhammar; Proctor, Siegel et al.) and others. Scientists also research the influence of external factors, such as economic, social, technological, political-legal, on the innovation process. The latter research gained momentum when *national innovation systems* (Freeman, Lundvall) emerged, referred to by other scientists (Camagni, Cooke) also as *regional innovation systems*. It should be noted that research on universities as integral parts of a national innovation system, or as innovative organizations, started only in the 1980s (Louis et al.; Clark; Etzkowitz and Leydesdorff). Up to the 1970s, universities had only a supporting role in the innovation process; they were regarded as an external source of knowledge for industry. Also, the research on innovative capacities of universities as specific institutions was missing as regards organizational capacities.

While analyzing the factors of internal and external environments that influence the innovative process, it has become obvious that not all factors have the same influence on organizations. Depending on the type of organization, its field of activities or size, the effect of certain factors can be negligible, while other factors may have a crucial influence on the innovative activities of an organization. If we separate organization's capabilities, resources and specific assets such as its recognition, reputation, educated employees, etc., we see that these elements do not create value on their own; rather, they have to be integrated into organizational processes in order to increase organizational capacity (Grant). Based on this idea, some research has been done on organizational innovative capabilities in terms of resources, processes and values (Teece et al.; Cristensen and Raynor; Serger and Hanson; Conway and Steward);

crucial factors have been identified and indices describing these factors have been presented. Other scholars (Grant; Hunger and Wheeles) approached innovative capacities as an integral part of the internal environment factors that determine the strategy of an organization; innovative capacities allow an organization to elucidate its weaknesses and strengths as well as to reveal opportunities and to avoid threats.

Since the 1980s, some scholars have been focusing on the management and mission transformation of universities as an integral part of society or the innovation system, the transformation taking place during the period of changes (Etzkowitz and Leydesdorff; Clark; Rinne and Koivula). Universities are analyzed as specific organizations (Golish et al.; Pounder; Ramsden; Rowley and Sherman; Shattock), an attempt is made to find their similarities to and differences from functioning business entities, their prospects and obstacles are analyzed, also an attempt is made to find and present the means that could fit the management of universities while making them stronger in terms of their organizational competences and efficiency during the period of changes/transformation. Special consideration could be given to the research on the third mission of universities, i.e. the emergence of entrepreneurialism and innovation, their implementation and effects on university community (Brennan et al.; Clark; Laukkanen; Lowe and Gonzalez-Brambila; Martinelli et al.; Slaughter and Leslie), as well as to the research related to the commercialization of a university's intellectual product (Aguirre et al.; O'Gorman et al.; Van Burg et al.).

Lithuanian researchers have also been investigating the above-mentioned topics with their occasional generalizations or adaptation to the Lithuanian context. Though the majority of the Lithuanian research on innovations has focused on the analysis of innovation encouragement policy, also research on knowledge management (Atkočiūnienė; Jucevičius and Ilonienė; Girdauskienė and Savanevičienė), creativity promotion (Poškienė; Ganusauskaitė and Liesionis), the influence of economic factors on innovations in business (Keršys), management potential analysis (Diskienė et al., Diskienė and Marčinskas) has been carried

out. Lithuanian scholars have also carried out research on universities as an integral part of the knowledge system during the period of transformations: an analysis has been done on elite higher education turning into mass higher education (Gudaitytė, Jucevičienė), teachers' attitude towards the activity of the institution and academic values (Kardelis et al.), university management problems (Mikalauskas and Švagždienė).

However, the majority of the above-mentioned research of foreign and Lithuanian scholars mainly focuses on one or several factors that influence the innovative process, university management models, the influence of universities as an integral part of the innovation system, i.e. this research does not reveal the systematic, polynomial and multichannel influence of the factors on universities' innovative potential (IP). Also, the very concept of the potential is perceived differently depending on the relations of the topic to IP; sometimes IP is perceived in a very narrow sense by appreciating only the human resources and facilities of an organization. Research on universities as organizations peculiar for their collective decision-making, historical traditions, aims and missions has not been carried out in terms of IP generalization which would distinguish the particularities of universities and stress their differences from other organizations. Despite the abundance of research, there is a lack of a complex analysis of research on various areas integrated through the universities' innovative potential. Essential elements that reflect their innovative potential are not systemized, and there is no system of means and measures to shape and strengthen these elements.

In the present research, the author aimed to take the above-mentioned topics and find separate statements, factors and features, to distinguish essential ones and to combine them in a complex way (as far as it was possible) in order to show their importance and role in shaping the innovative potential of a university. No study of such a combining and generalizing character has been carried out so far.

The aim of the research

To reveal and justify the factors determining universities' innovative potential and to present a system of measures of their IP shaping and strengthening.

The following tasks were set to achieve the aim of the research:

1. To analyze previous studies and to provide the concept of organizations' IP.
2. To reveal peculiarities of the attitude of a university as a specific organization towards entrepreneurialism and innovation.
3. To define an innovative university and to establish the premises that enable a university to become innovative.
4. Upon establishing the influence of the factors of internal and external environments on the IP of an organization, to provide the relationships of priorities and opportunities that have influenced the generated idea.
5. Upon investigating the IP of Lithuania, to identify the essential factors that influence the country's IP level and to show its interaction with universities' IP.
6. Based on the empiric research of the functioning of the universities' IP mechanism and innovative potential, upon estimating the innovative activities of the universities, their strengths and weaknesses, to develop more theoretical premises for the transformation of universities into innovative ones by implementing measures of shaping and strengthening their IP.

The object of the research

The object of the research was a social artefact – an innovative activity, and the topic under study was universities' innovative potential and its shaping measures. Three most innovative Lithuanian universities – the Kaunas University of Technology, Vilnius Gediminas Technical University, and Vilnius University – have been chosen as the study objects.

The methods/instruments of the research

A comparative and systematic logical analysis of previous research was carried out for investigating and analyzing the process of innovations, factors influencing innovations, and determining the IP structure. A list of the universities' IP elements was produced; it was based on this analysis, as well as on synthesis, abstraction, the application of deduction methods, systemizing and classification.

In order to determine the value of IP in terms of a country and a university, the interaction or its absence among participants of the national innovative system expressed in statistic values, as well as the legal acts and university internal regulations that influence the scientific innovative process, the content analysis was used, which could be divided into a) document analysis and b) statistical data analysis.

The third instrument employed during the research was an expert survey. This instrument was used due to the peculiarities of the topic and its relative novelty in the context of Lithuania. The participants of the survey were people who had professional experience in organizing innovations, in the interaction with participants of the national innovations system, in establishing the role of a university in the innovative process.

The fourth instrument was questionnaires via mail. The recipients of questionnaires were selected according to the Triple Helix model: they were representatives of government, business and universities. This instrument, together with the expert survey, was intended to help to detail and prioritize the list of measures produced with the help of research analysis. It was also important to find out the approach of different representatives of society to the topic under study, the points where their opinions coincided or totally differed.

To generalize the data of analysis, the SPSS (*Statistical Package for the Social Sciences*) and Microsoft Excel software were used. The generalized data were used to specify the measures of the innovative potential-shaping mechanism and the extent of their relevance to Lithuanian universities of this period of time. The data gathered by all methods were associ-

ated by the method of inductive reasoning (i.e. from individual instances to general ones) and are provided in the conclusions.

The novelty and scientific value the of the research

1. University IP was revealed and grounded in terms of resources, processes and values.
2. Essential elements reflecting the IP were determined and justified. It has established that in case of universities, factors based on values are more important than technologies and equipment, and the behaviour of management is crucial in terms of factors based on values.
3. Alongside the concepts of *service, corporate, entrepreneurial, McUniversity* provided by other authors, an exhaustive concept of *innovative* university is provided. It is based on the holistic approach to elements defining the innovative potential, such as organizational culture which promotes creativity, involved management behaviour which supports innovations, leadership which is clearly targeted to a continuous renewal of the organization, flat and flexible internal structures which are fully equipped with information flows, the motivated and qualified staff which is involved in generating innovations, and controlled principal knowledge and competences of an organization.
4. The mechanism of IP shaping and strengthening is provided and supplemented according to the results of an empiric investigation of Lithuanian universities. The mechanism covers interrelated organizational, information, cultural-social and financial measures.
5. For the first time in Lithuania the innovative activity of universities was analyzed as significant, specific and co-existing with other activities such as studies and fundamental research.
6. The results of the study can serve as a basis for developing the model of university innovation management.

Practical value of the research

1. The proposed IP shaping and strengthening mechanism can be applied in different scientific organizations that want to carry out their

IP analysis and according to its data to determine the weaknesses, strengths, threats and opportunities of their innovative activities. Besides, the majority of measures can be used by business entities.

2. Universities aiming to develop their own innovation management system can use organizational, information, social and financial measures of IP strengthening, shaping and interaction with other elements. These measures can be applied in accordance with the strategic goals of a university.
3. The proposed RTD activity strategic management model of a university, together with IP SWOT analysis, can serve as the basis for developing and implementing the strategy of making a university innovative.
4. The analysis of the country's IP based on universities' involvement into the innovative process revealed the main reasons for the low level of the country's IP. The identification of these reasons suggests actions to be taken by the country's politicians, university managers, managers of business enterprises in order to strengthen and (in certain cases) to shape IP on the national level.
5. During the research, a direct link was established among the level of IP of the country's universities and the universities under study, the motivation of the staff creating innovations, and the incompleteness of internal processes of the universities. The main motivators for scientists, revealed during the empirical research, were personal development opportunities, monetary remuneration, and interesting work (process). These motivators differ from scientists' motivators determined by Western scholars, such as recognition by the academic community and the desire to boost funds for research. This fact indicates the necessity of a more extensive study in order to elucidate the reasons for such differences in inotivation.

APPROBATION AND DISSEMINATION OF THE RESEARCH RESULTS

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BRIEF SUMMARY OF DOCTORAL THESIS CONTENT

1. Theoretical Interpretation of Innovation Process

In the first part of the thesis, scientific literature on the systemic approach to the innovation process was examined, the way in which the treatment of innovation content has been changing, the prevailing elements of innovation classification and its new elements were analysed, a logical scheme of the innovative process was presented from the management perspective; the components of the innovation management system were demonstrated, and the factors of the innovative process were evaluated by focusing on the external factors. Subsection **1.1. Innovation: Conception and Classification** deals with the evolution of treating and understanding innovations from the concept of the entrepreneur performing "creative destruction", proposed by Schumpeter, to the organisational level of innovations and further on. At the organisational level, the aim was to find innovation sources within an organisation itself and to make use of its competencies; it was focused on the improvement of RTD management effectiveness through pursuing innovation goals and promoting innovations in organisations. The further evolution of the understanding of innovation continued up to the contemporary innovative systems, theoretically based on Freeman's (1987) studies and developed by Hage and Hollingsworth (2000), up to the *innovation–idea network theory* combining the relations among research carried out in the industry, fundamental research, applied research, product development and marketing research. The **Triple Helix** theory by Etzkowitz and Leydesdorff (1997), combining industry, government and scientists, involved more participants into these networks.

The work by researchers of the Lithuanian Innovation Centre (Jakubavičius, Strazdas and Gečas, 2003), summarising the classification of innovations in Lithuania, was most often used in the country's scientific literature; however, a certain revision was to be performed and it

was to be supplemented with new attributes; therefore, this subsection contains a table of innovation classification, updated by the author (Table 1).

TABLE 1. **Classification of innovations**

Classification attribute	Classification
Object	Product, process, position, paradigm (4Ps)
Purpose	Product, service, technological, organisational, supplying, marketing, business model, institutional, comprehensive
Implementation level	Individual, company, industry, part of society, state, region, world
Frequency	Single, multiple
Degree of novelty	Improved technology/product, modified technology/product, considerable improvement, revolutionary innovation
Organisational	Individual, internal organisational, cross-organisational
Nature	Quantitative, qualitative
Composition	Separate components, connecting/ "architectural"
Result	Fundamental, experimental, basic, diffuse, relative
Impact	Economic, social, ecological, military, comprehensive
Execution	Supporting, destroying
Area of origin/ appearance	From science (technology push), from market needs (market pull), from relations between market players, from technology networks, from social networks
Accessibility	Tacit, explicit knowledge

Subsection **1.2. Logical Structure of Innovation Process** analyses innovations as a continuous process. The major theoretical descriptions of innovative process models are provided. Most generic of them would be the one proposed by Bessant and Tidd (2007); it is based on three major stages: 1) generation of new ideas; 2) selection of the best ones; 3) their implementation. However, to escape the impression that the process of innovation development is simple and linear, the typology of innovation models, provided by Kamoche and Cunha (2001), is introduced. They distinguish *consistent, compressed, flexible and improvised* models of the innovative process and present the aims, characteristics and major draw-

backs of each process. Suggestions by other scholars in defining the stages of the innovative process are presented as well: a) Golish et al. (2008): 1) *identification of possibility, 2) design and development, 3) testing and pilot production, 4) introduction and production, 5) management of product lifecycle*; b) Griffin's (1993) research on the *innovation tunnel* where the process also starts from the generation of ideas and passes through four gates: *research, implementation, transfer, and serial production as well as launch on the market*; c) Hage and Hollingsworth's (2000) description of the "idea innovation networks": 1) *basic research; 2) applied research; 3) product (prototype) design; 4) prototype construction; 5) product production; 6) marketing; 7) sales; 8) guarantee maintenance*. This subsection also presents a plan of measures and actions at each stage.

Subsection **1.3. Innovation Management System** is aimed at explaining the importance of innovation leadership, showing the key components of the innovation management process and the major obstacles encountered by organisations in introducing management systems. According to Bessant and Tidd (2007), an organisation introducing innovations has a limited amount of resources; therefore, it cannot afford wasting them, i.e. a strategy and leadership are required in order to follow the right path. The innovation management system is presented on the example of Kearney's "Innovation House" (2006). The roof of innovations consists of a company's innovation strategy, arising from innovation organisation and culture within the company and determining what innovations are available and what innovations will be introduced. The Introduction is not limited to one stage: the management of innovations should take place throughout the entire lifecycle of the innovation and even after its accomplishment, i.e. smoothly start the introduction of new innovations. The management of innovation lifecycle includes the stage of idea generation and selection, the product/process development (construction) stage and launch on the market, and the stage of the further development. Processes foreseen in the pyramid of the innovation house will not take place if there is no firm basis. Basic or fundamental

values which enable to start and perform the innovation process exist in each innovative organisation. Suggestions by Drucker (1987) as well as Nonaka and Takeuchi (1995) on fundamental conditions enabling organisations to create innovations are also presented.

Studies by the European Commission (2004) and Lithuanian scholars (Poškienė, 2006; Diskienė et al., 2008; Adekola et al., 2008, Binkauskas, 2009) on challenges encountered by a company performing innovation management processes and the exceptional opinion by Wordenweber and Wickord (2008) that the aims and application of innovation management are clear and easily conveyed are analysed. Taking into consideration the theoretical material of this subsection, it should be summarised that when developing an innovation management system within a company, *the support by top management must be ensured, creativity has to be fostered, the culture of innovations should be developed in the company, the strategy aimed at the promotion of innovations has to be formulated, and innovations must be constantly introduced.*

The aim of Subsection **1.4. Factors Related to External and Internal Environment of Innovation Process** dealing with the factors making an impact on companies' environment has been to demonstrate what external factors are most important and to what extent they are able to influence the decisions on innovative activities of the organisation. Upon analysing and systematising scientific literature, the following large groups of external factors were determined: *political-legal, economic, social, technological and pertaining to the market*. Alongside with the external factors, the internal ones were also specified. Some scholars (Jakubavičius et al.) classify internal factors into rather bulky groups and others (Isaksen and Tidd) into small ones. By summarising the structure of internal factors, they can be conditionally divided into two large groups: *1) organisational culture; 2) resources*.

2. Third Mission of Universities: Assumptions and Historical Alternative

This section is aimed at the study and introduction of universities as specific participants in the innovative system. The change in the universities' mission and their place within society as part of a complex innovation system and knowledge society was studied. The historical alternative is introduced and the third concept of entrepreneurial and innovative universities is presented, the obstacles and barriers with respect to the implementation of entrepreneurial and innovative ideas in the academic community are specified.

Subsection **2.1. Changes in Universities' Mission and Place within Society** presents the evolution of universities from the era of Bologna and Paris universities based on the Christian doctrine to Humboldt-type universities combining two components– studies and science – as well as changes that took place after World War II when educational institutions expanded from elite to mass and more versatile universities. A further analysis is performed – till the seventies of the last century when the state started interfering with the life of universities much more actively – trying to establish the performance of universities, related to quality and accountability. Wissema (2009) divides the evolution of universities into three phases. The third phase of universities, present only in the initial stages of their development, is defined as the commercial use of scientific knowledge, as an additional mission next to education and science. Other scholars deem innovation and entrepreneurialism to be the third mission of universities.

This subsection deals with the external rationales due to which the third mission emerges. The most important of them is the reducing public funding of universities and the increasing competition for additional funds. The third mission of universities may also occur due to the so-called "technology push" when in a university with the best conditions to develop technologies the advanced, revolutionary or simply better technologies are developed and ways are sought to test them on the market.

This can be achieved by selling technologies to businesses or by starting up one's own companies. However, at the same time scholars reasonably state that if universities are looking for funding together with businesses, they lose their independence and impartiality, and the one who offers funding (resources) acquires influence.

Subsection **2.2.** studies the phenomenon of entrepreneurialism and innovation as well as its appearance in universities. The EU Green Paper *defines entrepreneurialism as a successful implementation of a business idea by combining creativity or innovations with intelligent management*. As early as in 1998, Burton R. Clark identified five key elements defining changes in entrepreneurialism at universities. However, there is no typical way of how to be or become an entrepreneurial university, and there cannot be one as both attitudes towards university conceptions and the implementation of their strategies upon choosing a certain conception are an individual business of their own, and attempts to make a sudden institutional change are met by an active resistance of the academic community. This subsection specifies the major fears by scholars with regard to entrepreneurialism in universities and presents the proposed measures to overcome these fears, based on the studies by foreign scholars (Slaughter and Leslie; Laukkanen; McCaffery) and on data from the interviews performed by the author.

3. Theoretical Definiteness of Mechanism for Shaping Organisation's Innovative Potential

The section deals with theoretical scientific material related to studies of organisations' innovative capabilities or potential. A mechanism for shaping universities' IP – a certain system of interrelated processes due to which the innovative potential is developed within an organisation – is proposed. The IP definition is presented, and it is demonstrated how interrelated organisational, cultural, social, informational, technological and financial actions/measures make an impact on universities' resources, processes and values which are the key IP components. The key

elements of the IP shaping mechanism, identified by the author of the thesis, are introduced, and the need for sustainability and consistency in organisations, suggested by the author, when implementing ideas is demonstrated.

Subsection **3.1. Concept of Organisations' Innovative Potential** is aimed at specifying and substantiating IP, because individual scholars provide various descriptions of capabilities or the potential. This section provides also the description of a knowledge organisation and similarities between the management of a knowledge organisation and innovation management. Suggestions are made that the potential should be described through tangible and intangible capital (Conwey and Steward, 2009), through processes, positions and ways (Teece et al., 1997), through resources, processes and values (Cristensen and Reynold, 1997), through the ability to access knowledge, to transform knowledge into products and services as well as through companies' desire to innovate (Server and Hanson, 2004). When summarising scholars' works, two major classifications of the potential or capabilities become evident. The first one is *tangible and intangible*, the second being *resources, processes and values* (RPV).

Subsection **3.2. Structure of Elements within the Mechanism for Shaping Organisations' Innovative Potential** establishes universities' IP composition and elements defining the potential, taking into account a comparative and systemic-logical analysis of scientific literature, performed in the previous sections by studying the course of the innovative process, factors of the external and internal innovative environment, determining this process, as well as the impact of these factors on the organisation's innovative potential.

The elements defining both the innovation management process and the innovation potential – organisational culture, behaviour and leadership by top management, organisational structure, organisational strategy and staff – along with technologies and data bases are the major ones, and the success of the innovative process and of the organisation itself depends on their understanding and adequate application in the activities

TABLE 2. **Key elements reflecting innovative potential**

Value-defining	Resource-defining	Process-defining
▪ Behaviour and leadership by top management ▪ Cultural environment/ organisational climate ▪ Mission, vision, strategy ▪ Traditions, routine	▪ People (individuals' knowledge and skills) ▪ Structure ▪ Relations with external participants ▪ Financial resources ▪ Equipment and technologies ▪ Information and data bases (patents, other intellectual property, etc.) ▪ Brand, etc., encompassing awareness, reputation	▪ Coordination ▪ Communication ▪ Staff motivation ▪ Learning and education ▪ Planning ▪ Decision making ▪ Protection and use of intellectual property (IP) ▪ Study of external environment

of each organisation. Further in this subsection, scholars' works related to the specifics of individual elements, their relation to the organisations' innovative process management and influence on IP are studied.

Subsection **3.3. Requirement for Sustainability and Consistency** is aimed at demonstrating the harmony between an organisation's priorities and the possibilities influencing ideas, and at providing examples of the consequences when there is no harmony.

In the event when priorities outweigh possibilities, there is a risk that an idea will get trapped in waiting for a suitable possibility – financial resources, relations with potential buyers or participants, until a market analysis is conducted, structures are created which will help to commercialise the idea, i.e. the idea gets into the so-called "valley of death" (Auerswald and Branscomb, 2003). If such "trapped" ideas become quite numerous, they may cause disillusion and distrust in the top management of universities, and *in extremis* they may also lead to the loss of individual's internal motivation or self-esteem. In the event when possibilities outweigh priorities, the generated ideas, upon failing to find support for their implementation at the university because of various other priorities may be implemented in a "guerrilla" way, i.e. by making use of the possibilities provided by the university: human resources (e.g., students' work in laboratories), equipment of laboratories, information

provision in libraries, databases, university relations with businessmen. In this case, an idea will achieve technological development without formal participation of the university. However, such a development, which raises ethical and moral questions, may end up in requesting a scholar to leave the university or he/she may decide to retreat to business after sensing the possibility provided by the idea. In an ideal case when priorities match possibilities, when support by the top management is offered, when the activities performed comply with strategic objectives and the established structure supports, analyses and helps developing the idea – the idea may achieve the level of implementation and adaptation in life, i.e. become an innovation.

4. Substantiation of Research Methodology

The following logic determined the following methods and techniques of the research:

- the third mission of universities – creation of innovations and entrepreneurialism – comprises new and unfamiliar activities requiring challenges in activities and thinking;
- universities do not operate from the zero-start phase; any proposed measures and mechanisms will have to change, modify or replace the old measures and mechanisms;
- due to delayed political, organisational, financial reforms related to innovations, no practical data on the application of the mechanism complying with the advanced trends is yet available in Lithuania today; therefore, the basis is the suggestions by foreign scholars and practitioners as well as empirical data, used upon verifying assumptions about the functioning of the mechanism as objectively as possible by means of interviews and post surveys;
- the innovative process does not take place in a closed space; actually, it has already started in universities and is strongly influenced by external factors and participants whose opinion on shaping the innovative potential is to be taken into account.

4.1. Substantiation of Empirical Research Methods and Techniques. Based on the logic presented above, the following research methods were selected to obtain the required data: the comparative and systemic-logical analysis of scientific literature; the content analysis, which can be divided as follows: a) document analysis and b) data analysis; expert interviews; questionnaire survey by post; mathematical statistics. The comparative and systemic-logical analysis of scientific literature was moved from auxiliary measures of research (Kardelis, 2007) to the major ones, because in Lithuania there was no research base for the topic chosen when applying other methods – the innovation process, university status and their role in the innovation system; finally, the understanding of innovation process by scholars and other players was insufficient. The analysis of scientific literature helped to understand (and to improve to the greatest extent possible) the practices and decisions proposed on the basis of research conducted by scholars. The analysis of scientific literature was based on several major sources: works by Drucker P. (1987), Burton R. Clark (1998), Bessant, J. and Tidd, J. (2007). These pieces of work constituted the core of the analysis of scientific literature, which was later supplemented by theoretical works of other scholars.

The content analysis was chosen in order to examine whether the content of officially approved documents favours the process of creating innovations, to what extent these documents focus on the organisational culture at universities, whether the adopted laws or governmental resolutions have continuity in institutional legislation. The other stage of analysis is related to quantitative research. In order to highlight the level of the innovative potential in Lithuania and universities, expressed in figures, the indicators that are presented when assessing the innovation level of a state at the global and European levels were analysed employing the *European Innovation Scoreboard* and national data sets. The conclusions made in this part of research allowed a more skilled and thorough preparation for using other methods (interviews and questionnaire surveys by post) as well as for forming the opinion on the innovation level of the state in the European context.

Data obtained during interviews were intended for assessing assumptions about the functioning of the proposed innovative potential mechanisms in the context of Lithuanian universities. Interviews according to Cohen and Manion, 1989 (Kardelis, 2007) were to: 1) help acquire the required missing information; 2) verify the hypotheses; 3) assess other research methods by using them alongside with other research methods intended for collecting information and, in case of this research, help to prepare a more accurate and skilled questionnaire. The questionnaire survey by post was selected as a reliable, informative and most commonly used social research method. It was also important that it enabled to receive data anonymously when assessing the parameters of internal culture within universities (e.g., the managers' attitude towards innovations). This was very important for the impartiality of data. The Likert-type scale was selected for the questionnaire with closed or semi-open questions. When assessing the support of innovations by university managers (question 2.4. of the questionnaire), the Likert-type scale also contained an element typical of the Bogardus social distance scale: any option chosen by respondents out of five suggested possibilities, with the exception of one, meant that the top management did not support innovations.

Methods of mathematical statistics were selected to present the survey data (the distribution of options chosen, their proportions) in a more accurate and detailed way. As the survey was conducted in three different universities, it was also important to compare the prevailing attitudes in each of them. A group comparison was also used for comparing the attitudes of representatives (scientific, governmental, and business) selected by applying the Triple Helix principle. The correlation (interdependence between two variables) enabled to confirm or reject the hypothesis raised after the author of the thesis had familiarised himself with the first results of the research. To strengthen the relation between two variables, Spearman's (rho) rank correlation coefficient was used. When studying statistical and some other quantitative data and making comparisons, a radar/spiral chart was used, and horizontal column diagrams, histo-

grams, plateau diagrams were drawn as best reflecting the distribution of attitudes.

Subsection **4.2. Logical Structure, Course and Sample of Research** presents the substantiation for the course of the research, its logical structure and sample establishment. To explain part of IP resources, analysis of statistical data (Statistics Lithuania, World Bank, EUROSTAT, data from university reports) was used, and the explanation of part of processes and values was obtained upon analysing the content of documents. The document analysis involved the assessment of laws, governmental resolutions, orders and procedures of ministries interested and of other establishments. The document analysis also included a study and assessment of internal documentation regulating the activities of three selected universities. It is noteworthy that the legislation adopted over the period 2009–2010 diametrically differed from legislation adopted before 2009. The author of the thesis performed an additional assessment of the provisions of the new legislation; they are reflected in the results of the research and helped to prepare the questionnaire.

With sufficient information on the level of the innovative potential available in Lithuania and upon compiling a list of potential measures in accordance with the research plan, the attitudes were verified by means of interviews. Answers of eight individuals were surveyed, of them six represented the universities surveyed, and the rest two were representatives of the Ministry of Economy and Ministry of Education and Science of the Republic of Lithuania. Each interview lasted 1.5 to 2 hours. A semi-structured interview protocol was used to ask the same questions allowing each respondent react in a flexible manner, i.e. by allowing the respondents to expand the scope of questions.

The following aims were pursued by the post survey:

- find out the opinion of university scholars on the level of the innovative potential in the country;
- clarify the reasons for a certain level of the potential;
- specify more exactly the issues determining the passive participation by universities in innovative activities;

- find out the acceptability of measures proposed to university scholars;
- identify barriers and fears leading to a passive participation in the establishment of business enterprises;
- elucidate scholars' attitudes towards the introduction of important organisational and financial measures depending on their opinion on the priorities of motivation, information retrieval, team building.

The respondents were selected from three groups: science, government, and business. Three faculties related to scientific innovative activities to the greatest extent from three universities – Vilnius University (VU), Vilnius Gediminas Technical University (VGTU) and Kaunas University of Technology (KTU) – were selected for the survey of university representatives. The universities specified above were selected due to their clear leadership among other Lithuanian universities in attracting funds for scientific research and technology development by calculating "scientific production" points. Thirty individuals from each faculty were selected for the study. In total, **270** respondents were sent questionnaires by post, and **119** completed questionnaires were received from them. The representatives of governmental bodies or public institutions related to the innovative process were also included into a separate group of respondents. The selection of *judgement sample* was determined when selecting sampling units best representing the whole body surveyed, i.e. the individuals who could really be treated as representatives of the second part of the innovation system – government representatives – through their direct activities. In total, **40** questionnaires were sent out, and **17** completed questionnaires were received. The third group of respondents consisted of business representatives. Although, according to the data from Statistics Lithuania, in 2008 the number of innovative enterprises accounted for 28.8 per cent of the total number of enterprises, the representation of this number is not guaranteed and differs from analogous EUROSTAT data. The author of the thesis supposes that the actual number of really innovative companies is expressed by the number of

advanced (high and medium) technology companies provided by Statistics Lithuania. In 2008, they accounted for 0.5 per cent of all registered business entities, i. e. there were 367 companies (Statistics Lithuania, 2009). Specific companies were selected based on the databases of the Lithuanian Confederation of Industrialists, the Lithuanian Innovation Centre, the Ministry of Economy of the Republic of Lithuania and the lists of participants in the contest "Prize of Innovations" organised by the Lithuanian Innovation Centre and the Lithuanian Confederation of Industrialists over the period from 2005 to 2010. The questionnaires were sent to 81 enterprises by addressing them to the company manger or the head of a commercial or scientific unit. In total, **119** questionnaires were sent out, and **31** completed questionnaires were received.

Twenty six respondents out of all received questionnaires proposed their own option in a couple of questions. The proposed options were analysed by the author of the thesis. The majority of the proposals were revealed through other related questions in the questionnaire and were ignored by the author of the thesis. Significant proposals were provided in the results of the questionnaire survey; however, they were not included in the frequency calculation results as they were isolated, provided by several respondents and different.

The data acquired from the questionnaire survey were coded and entered into Excel tables; then they were exported to the SPSS programme. The results of the survey are reflected in tables, charts, histograms and plateau diagrams.

5. Study of Innovative Potential in Most Innovative Universities of Lithuania

Subsection **5.1. Study of the State of Innovative Potential in Lithuania** analyses the IP of the country and its universities via *input, activities and result* data groups. The *input* part analyses also RTD human resources which are compared with the EU-27 average, as well as funds allocated to RTD. Lithuania lags behind least in public expenditure on education (4.7

versus 5); however, the other indicators are worse; thus, the total public expenditure in the RTD of GDP is nearly 2.5 times lower than the EU-27 average (0.8 versus 1.9); public expenditure on RTD in the total public expenditure is 2 times lower than the EU average (0.7 versus 1.51); the situation is even worse in terms of business enterprise expenditure on RTD, which in Lithuania is even 6.3 times lower (0.19 versus 1.21). It is necessary to mention separately the share of the venture capital. In Lithuania, the only EU member state, this share does not reach even a hundredth of the EU average, i.e. it can nearly be stated that the venture capital actually did not exist in Lithuania at the time of collecting data for the thesis (over the period from 2008 to 2010).

The indicators reflecting the *input* human resources of the universities surveyed were compared with the data on other European universities. In 2009, by the number of students per one lecturer, scientific worker, the results were the best in KTU (15.1 conditional students per one lecturer, scientific worker); VU keeps abreast with 15.6 conditional students. In 2009, by the number of PhD students from the total number of students, the best results were achieved by VU (3.1 per cent). In 2009, by the number of PhD students per one lecturer, the results were best in VGTU – 0.32 conditional PhD student. Please compare: the Swiss Federal Institute of Technology, which is rated 18th in the QS World University Rankings, has 15 378 students. The percentage of PhD students in this institute is 22 per cent of the total number of students, i.e. 3.2 conditional students per one lecturer, scientific worker. Copenhagen University (Denmark), rated 52nd in QS Rankings, has 40 681 students, and the percentage of PhD students is 6.5 per cent of the total number of students, i.e. over twice as much as the best indicator of a Lithuanian university: 9.2 conditional students per one lecturer, scientific worker.

To summarize the *input* part, it can be stated that, although Lithuania is on the same level with regard to several relative indicators and in certain areas is even ahead of the EU averages, Lithuania still lags behind strongly in terms of business enterprise investments into RTD, accessibility of venture capital as well as the number of PhD students from

non-EU states. The assessment of human resources at the Lithuanian universities under analysis and a comparison with the universities positioned higher in ranking tables also show that the relative indicators of Lithuanian universities as regards the number of PhD students, lecturers and scientific workers are much poorer.

In the part of results that depend on intellectual property, innovators and the economic effect, Lithuania is lagging behind practically in all positions: over ten times (3 and 36.2) by the number of joint scientific and business publications per one million residents, and nearly twice (7.4 and 12.8) by the percentage of employees in the knowledge-receptive industrial sectors (services and production) versus the total number of employees. The Lithuanian potential in the statistics of patents is one of the lowest among the new EU member states, with a huge gap in terms of registered patents per one million residents both in the European Patent Organisation (1.3 versus 105.7) and in the US Patent and Trademark Service (0.5 versus 52.2). As a result, the income generated from licences and patents sold abroad (as a percentage of GDP) equals to zero in Lithuania.

The fact that quite good input data produce extremely poor output data requires to show the data and results that would reflect the other components of the potential – processes and values – which affect the part of resources in a way in which the result obtained is extremely poor. One of the most important indicators is the cooperation between science and business. The expenditure of higher education on RTD covered from the funds received from business is relatively low – 2.4 per cent of the total share of university expenditure funding from all sources. In terms of the second indicator (the number of joint ventures established by universities and business), the conclusion about the cooperation between business and science is outspoken. According to the data of Statistics Lithuania, reports by ministries and universities, in general, no joint ventures were established in the three universities studied between 2009 and 2010. In terms of the third indicator – the share and significance of knowledge and information received from universities by business enterprises – it is obvious that a very low share of enterprises deems the

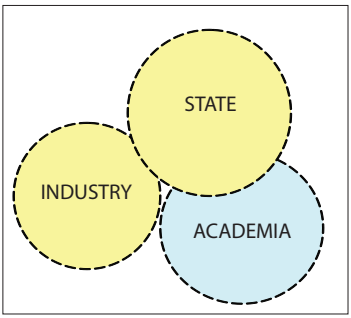

FIGURE 1. **Distorted Triple Helix model of Lithuanian innovation system up to 2009**

information received from universities to be significant. The fourth indicator – the number of joint network constructs (clusters) – was also equal to zero during the period of study, i.e. up to 2010. Based on the data of quantitative analysis, the author of the thesis makes a generalisation that the innovation system which includes the representatives of public institutions, academic science areas and industry during the period covered by the thesis (2004–2009) was not operational and had a distorted shape in Lithuania as compared with the Triple Helix model proposed by Etzkowitz et al. (2002).

5.2. Feasibility Study on Assumptions about Functioning of Universities' Innovative Potential Mechanism and on Innovation of Universities. Subsection **5.2.1. Document Analysis** provides the factors determining the innovative activities of the universities under study, and they are compared with the recommended ones in case of an innovative organisation. Upon summarising the data obtained by means of document analysis and by relating them to the results acquired by means of quantitative data, it is obvious that the publicly expressed or communicated value judgement of universities, their strategic objectives, the focus areas of the top management, the focus on intellectual property, staff motivation schemes, the focus on entrepreneurialism, the integration mechanism of individual units are unfavourable for the innovation process. However, there is also a positive position which manifests itself through decision-making procedures in separate, in particular relatively low-value, projects through flexible structures of scientific projects and at the level of individual scholars. Information provision, focus on information accumulation, investments by universities into information systems can also be deemed to be positive.

Subsection **5.2.2. Questionnaire Survey of Innovation System Participants** provides a detailed survey of data. The data are illustrated in 22 column horizontal charts in the text and annexes as well as in four additional tables.

Data obtained from the empirical survey (questionnaire and interviews) are summarised and interpreted by taking into account data of the quantitative research presented in **Subsection 5.3.**

Subsection 5.4. presents suggestions for the practical application of the survey results, survey restrictions revealed by the author, and the possible directions of further research.

CONCLUSIONS AND SUGGESTIONS

1. By summarising the work of scholars describing the potential or capabilities of organisations, the author of the thesis identifies two major classifications of potential or and capabilities. The first one is *tangible* and *intangible*, and the second embraces *resources, processes and values* (RPV). The first classification, in the author's view, is simpler, but it is too broad for reflecting the entire range of intangible capital. Besides, in a narrower context, intangible capital is often understood only as intangible values – licences, patents, rights acquired, etc. The second classification (RPV) is more detailed and more accurate in terms of an innovative organisation as it emphasises three major components of the innovative process. The weakness of the second classification is the fact that if compared with the first classification, values and processes could be attributed to the intangible capital, while resources are a rather broad concept involving not only financial funds, material values, but also human capital and knowledge, as well as the structure and technologies of an organisation.
2. The analysis of literature has revealed universities to be specific and exclusive participants of the innovation system in which the innovative process very seldom completes the entire cycle. Most often, universities hand over the phases of launch on the market and ensuring feedback to business enterprises or in certain cases to their own companies being established. The innovative process in universities focuses on idea generation, their selection, design and development, testing and sometimes sample prototype or product manufacturing stages. Therefore, the author of the thesis is of the opinion that the factors and capabilities having a greater impact on the stages of product manufacture and launch on the market are not as significant for the stage of the lifetime cycle management of the product in case of universities as the factors and capabilities determining the first stages.

3. The analysis of scientific literature has shown that, for certain innovations to occur in an organised way, the organisation has to be innovative, and its strategic governance has to be in place. Scholars provide the description of an innovative organisation as well as the assumptions for it to be as follows: 1) ability to accept or create knowledge, 2) ability to transform knowledge into products and services, 3) desire to innovate. The ability to transform knowledge and the desire to innovate are described by a range of indicators, but the author of the thesis names the major ones which he relates to the approach of resources–processes–values (RPV) to the organisation's potential, and they would be the following: **sufficient skilled human resources of the organisation**, **organisational culture** encouraging creativity and constant learning by the organisation and its members, the inclination of the organisation members to **entrepreneurialism,** and **support of innovations by the top management.** In order to be able to accept and create knowledge, skilled human resources are also required, but they do not suffice; **a scientific base has to be developed in the organisation** as well. Based on that, the author of the thesis suggests the following definition of an innovative university: *it would be a university able to obtain and create knowledge with sufficiently skilled human resources and organisational culture encouraging creativity, which enables to transform the acquired or created knowledge into the applicable one, and due to the inclination towards entrepreneurialism it is able to commercialise them.*
4. The specifics and exceptionality of universities with regard to other participants of the innovative system are also described by a sufficiently large quantity of huge human and informational resources accumulated in one place; this enables to take up integrated innovations by making use of good cooperative relations with external partners.
5. The transformation of universities into innovative entrepreneurial universities is not inevitable and, in the view of the author of the thesis, not all universities will transform. The universities that have safe-

guarded public funding and in their visions and missions envisage the dissemination of the entire knowledge body as such rather than the practical application thereof will not transform fast. However, those who will be the first to do so will acquire a competitive edge.

6. There is no typical way of how to become an innovative university, and there cannot be one. Each university has to make its own decisions, experience and apply them. And this is not always determined by only internal coordinated measures. It is necessary to take into account the factors of external environment as well as the time factor. However, it should also be noted that universities do not begin operating from the starting position; they function as institutions with their history, traditions and set values; therefore, when one starts changing the external environment and it becomes the environment that encourages and supports innovations, this process can be misunderstood in a university, it will be sabotaged or openly resisted not wishing to change the established practices. Taking this into account, the author of the thesis draws a conclusion that changes in the internal environment of universities and changes in the external environment encouraging innovation and entrepreneurialism of universities must be mutually adequate, and radical changes are to be initiated only upon obtaining support from the majority of the academic community.
7. When the input indicators in the innovative process – human resources, funding, knowledge – are good enough and the result (advanced technologies, patents, bud enterprises) is bad, a conclusion should be drawn that this situation is not caused by the lack of a greater funding or recruitment of new employees but by disorderly internal processes in the universities, the most important ones being communication, coordination, search for possibilities, and staff motivation.
8. Scientific literature specifies one of the major reasons why universities are rather unwilling to change, which is the closed hierarchical system of educational institutions. Differently from the opinion of

government and business representatives who consider that this is one of the major reasons for the low innovation level in the country, this disposition was not supported during the survey by university representatives. However, the assessment of other indicators (human potential) and of part of other *input* indicators by university representatives and the obvious difference in the opinion from other social groups and in particular from comparisons of statistical data have risen the assumption that scholars simply do not realise that the situation is poor. Universities and other participants in the innovative system – government and business – have a different understanding and priorities when assessing certain ongoing processes. Therefore, certain measures are applied slowly and controversially. Their sudden and unfounded application causes resistance or indifference of other participants. This assumption implies that the failure to realise the problems may be a big socio-cultural obstacle in directing universities towards innovation and entrepreneurialism.

9. According to theoretical works of scholars, permanent assets, such as buildings and equipment, are not an exceptional competence of organisations, and in the study of reasons for the low level of the innovative potential in universities, performed by the author of the thesis, it was confirmed by government and business representatives. Upon performing a comparative analysis of quantitative data and survey results in studying the significance of the factors of universities' innovative potential, the author of the thesis draws a conclusion that value-based factors are more significant than technologies and equipment, and the conduct of the top management is crucial among value-based factors. In two out of three Lithuanian universities studied, this factor is the weakest point of the innovative potential mechanism.
10. The conclusions by Lithuanian scholars who have studied organisational culture in business enterprises of the country that Lithuanian business enterprises do not make use of the internal sources for creating innovations, these sources do not receive support from the top

management, they are not encouraged by internal organisational culture, and employees do not see any motives why they should do this have been found applicable also to Lithuanian universities during this study.

11. Publicly expressed or communicated value judgements, strategic objectives, focus areas of the top management, the focus on intellectual property, staff motivation schemes, the focus on entrepreneurialism, the integration mechanism of individual units are unfavourable for the innovation process. However, there is also a positive position which manifests itself through decision-making procedures in some, in particular relatively low-value, projects, through flexible structures of scientific projects, and structures at the level of individual scholars. Information provision, focus on information accumulation, investments by universities into information systems can also be deemed to be positive.
12. The majority of business ideas found their way to universities through scholars–entrepreneurs. However, so far it has been difficult for the universities studied to legally regulate the relations between scholars–entrepreneurs and university with regard to research disclosure, time distribution for business and university, the use of university resources, the ownership of intellectual property and other issues. The qualities characteristic of entrepreneurial university were specified by R. B. Clark. In the Lithuanian universities studied, they are not developed, but entrepreneurialism is assessed positively by researchers, at least among technicians, technologists, and researchers of physical sciences. Universities must make use of their favourable approach when integrating the culture of entrepreneurialism into university life.
13. All the three respondent groups indicated that the fear to take financial risks was among the most important barriers for innovative entrepreneurial activities of the universities. Taking into account the fact that at the level of individual scholars, the fear that the future enterprise would not be commercially successful was named among

the major reasons preventing from taking up business, which took the second place after receipt of starting capital. This fact implies that the future universities will have to develop the ability to risk and tolerate risk which is characteristic of an innovative organisation.

14. The fear to take risks, to accept the idea that universities are also able to start commercialising research are the major setbacks on the path to an entrepreneurial university. With the change in the political environment by granting more rights to dispose of one's own assets, finally, by granting the right to a healthy risk and by tolerating minor errors, along with changing the way of thinking and encouraging employees to participate in the establishment of business entities and using the experience of scholars-businessmen for this purpose, organising the acquisition of legal and financial knowledge that is lacking, there is a hope that these fears will be overcome and the third mission of an entrepreneurial university will be implemented. While this mission is making its way to universities, the latter will have to identify and specify with more clarity their mission and objectives – to what extent they wish to be entrepreneurial and in what way or how many of them best reflect the needs of a university.
16. Researchers are motivated to create new knowledge and technologies mainly by the possibility of personal improvement, financial reward and interesting work (process). These motivators are different from the primary motivation of researchers in western countries, which is acknowledgement by scientific community.
17. When promoting the economic and cultural attractiveness and development of the region, the competitiveness and social capital are not made use of because of the diversity of participants (universities, municipalities, priorities of business enterprises) and of the absence of traditions of such cooperation. Therefore, a search for common priorities, their identification and communication to all participants of the innovative system, alongside with the creation of cooperation traditions, are the key driving forces for the progress of the region. However, the political, educational and industrial systems functio-

ning as a single innovative system require the infrastructure characterised by the availability of crediting and funding sources, intellectual resources and a developed information system among different participants of the innovative systems, which manifests itself via systems of innovation and business promotion as well as via the functional standards and rules of conduct.

SANTRAUKA

Problemos aktualumas. Šalims, siekiančioms užsitikrinti aukštą vietą pasaulio konkurencingumo lenktynėse, nebepakanka turėti didelių finansinių ar darbo jėgos išteklių. Vis labiau – tiek šalių trumpalaikėse ir ilgalaikėse vystymosi programose, tiek valstybių ekonominių sąjungų strategijose – pradedama akcentuoti mokslinių tyrimų ir technologinės plėtros (MTTP) reikšmė. Europos Komisija pabrėžė, kad žinios ir sugebėjimas jas perimti bus pagrindinis veiksnys greitai besikeičiančioje aukštų ir vidutinių technologijų bei globalioje ekonomikoje (European Commission , 2006).

Universitetų, kaip pagrindinių žinių kūrimo institutų, misija buvo ir yra švietimas ir mokslas, tačiau per pastaruosius du dešimtmečius formavosi ir dar viena universitetų misija, kuri adekvačiai atsirado reaguojant į pasaulyje vykstančius globalius procesus, greitai kintamą aplinką, studijų ir mokslo internacionalizaciją bei padidėjusią konkurenciją. Visuomenė ir valdžia bei verslas nori matyti universitetus savo partneriais, prisidedančiais prie ekonomikos ir visuomenės vystymosi kur kas tiksliau ir tiesiogiai. Ar tai būtų socialiniai kontraktai tarp valstybės ir universitetų, ar atsiradus valstybės–pramonės–mokslo ryšiams, dar vadinamiems Triple Helix modeliu, universitetai žengia į jiems naują fazę tapdami versliais ir inovatyviais universitetais. Trečioji – verslaus ir inovatyvaus universiteto misija teigia, kad universitetai atsidūrė globalios konkurencijos sąlygomis kovodami dėl studentų vadinamojoje masinio aukštojo švietimo rinkoje, maža to, jie yra drąsinami teikti savo tyrimus praktiniam pritaikymui ir gauti iš to naudą. Siekiant pradėti, skatinti, stiprinti ir valdyti inovacinį procesą, kuris šalia mokymo ir fundamentinių tyrimų atsiranda universitetuose, kyla iššūkis sukurti tinkamą inovacijų valdymo sistemą, kuri galėtų suformuoti ir sustiprinti esamą inovacinį universitetų potencialą. Norėdami išlikti globalioje mokymo ir mokslo rinkoje, universitetai privalės būti lankstūs, organizacinė jų kultūra turės būti imli ir skatinanti inovacijas, o į pokyčius universitetai turės žvelgti kaip į galimybę, o ne grėsmę.

Neturėdama didžiulių finansinių, materialinių ir technologinių išteklių, Lietuvos ekonomika pasitiko globalizacijos iššūkius nepasirengusi. Tačiau technologijos, inovacijos ir žinios gali pakeisti šalies ekonomiką. Svarbu – kiek šalies mokslo potencialas yra pajėgus patenkinti verslo poreikius ir ar verslas yra pa-

sirengęs bendradarbiauti su šalies mokslo institucijomis, turėdamas alternatyvą – įsigyti iš užsienio ir pritaikyti veikiančias technologijas ir inovacijas. Šiandien ir šalies politikai kelia universitetams užduotis aiškiau ir labiau prisidėti prie šalies pažangos kilimo, daugiau dėmesio skirti inovacijoms bei verslumo kultūrai puoselėti universitetuose. Vertinant pagal Cameron ir Quinn (1999) pasiūlytą tipologiją, posovietinio periodo Lietuvos universitetai laikomi gana nelanksčiomis uždaromis hierarchinėmis struktūromis, kur nei įstatymai, nei valdymo tradicijos, nei vidinė universitetų kultūra neskatino ir visiškai nerėmė verslumo ir inovacijų kūrimo mokslininkų tarpe. Universitetų finansavimas ir mokslinės produkcijos vertinimo tvarka akcentavo mokslinių publikacijų skaičių, o į taikomuosius tyrimus, universitetų bendradarbiavimą, užsakomuosius mokslinius tyrimus verslui buvo kreipiama mažai dėmesio. 2007 metais Lietuvos Vyriausybei priėmus sprendimą steigti integruotus mokslo ir verslo slėnius, o 2009-aisiais priėmus naują Mokslo ir studijų įstatymą, kuris numatė universitetų statuso pasikeitimą iš biudžetinės įstaigos į viešąją bei suteikiant universitetams intelektinės nuosavybės disponavimo teisę, jiems atsivėrė platesnės galimybės užsiimti tyrimo rezultatų komercializavimu, aktyvinti bendradarbiavimą su verslo įmonėmis, skatinti verslumo ir inovacijų kūrimo idėjas mokslininkų tarpe. Tačiau globalios konkurencijos paskatintas ir politikų inicijuotas trečiosios universitetų misijos – inovatyvumo ir verslumo įgyvendinimas sunkiai skinasi kelią Lietuvos universitetuose.

Mokslinė problema ir jos ištyrimo lygis. Inovacijų, kaip mokslinių tyrimų objekto, pradžia susijusi su XX a. ketvirtojo dešimtmečio Šumpeterio darbais, kuriuose dominavo individualaus verslininko novatoriaus pastangos gaminant naujas prekes ar teikiant paslaugas, kurios tampa skatinamąja ekonomikos augimo jėga. Ketvirtuoju ir penktuoju XX a. amžiaus dešimtmečiais moksliniai tyrimai ir inovacijos rėmėsi teorija, kad skatinamoji inovacijų jėga yra antrepreneris. Inovacijų apibūdinimas ir tyrimai, susiję su inovacijomis, buvo fokusuojami į tam tikrus inovacijų komponentus ir individualią inovacijų vadybą. Kitas inovacijų traktavimo ir supratimo etapas buvo šeštasis ir septintasis XX a. dešimtmečiai, kai šalia individualių inovacijų ir atskiro novatoriaus atsirado organizacinis inovacijų lygis. Buvo siekiama rasti inovacijų šaltinių pačioje organizacijoje, pasinaudoti jos kompetencijomis ir per inovacijų tikslų siekimą bei inovacijų skatinimą organizacijose buvo kreipiamas dėmesys į MTTP vadybos

efektyvinimą. Burns ir Stalker pasiūlytas organinis organizacijos tipas buvo laikomas inovatyvios organizacijos prototipu.

Inovatyvios organizacijos apibrėžimai ir tyrimai buvo plėtojami ir kitų mokslininkų – Kanter, Drucker, Freeman. Išskirtinos dvi daugiausia su autoriaus nagrinėjama problematika susijusios kryptys: inovacijų proceso ir valdymo sistemos moksliniai tyrimai (Griffin; Kamoche ir Cunha; Bessant ir Tidd) bei inovacinio proceso aplinkos moksliniai tyrimai. Inovacinio proceso aplinkos veiksnių tyrimai nagrinėja lyderystės (Borins, Carneiro, Drucker, Isaksen ir Tidd), darbuotojų motyvavimo, organizacinio klimato ar organizacijos kultūros, kūrybiškumo (Amabile, Amar, Ahmed ir kt., Ekvall ir Ryhammar, Proctor, Siegel) ir kitas problemas. Taip pat mokslininkų nagrinėjamos išorinių veiksnių – ekonominių, socialinių, technologinių, politinių-teisinių įtaka inovacijų procesui. Pastarieji tyrimai įgavo pagreitį atsiradus *nacionalinėms inovacijų sistemoms* (Freeman, Lundvall) ar kitų (Camagni, Cooke) mokslininkų vadinamoms *regioninėms inovacijų sistemoms.* Pažymėtina, kad universitetų, kaip nacionalinės inovacinės sistemos sudedamosios dalies ar kaip inovatyvios organizacijos, tyrimai pradėti tik nuo XX a. devintojo dešimtmečio (Louis ir kt.; Clark; Etzkowitz ir Leydesdorff). Iki pat XX a. aštuntojo dešimtmečio universitetų vaidmuo inovacijų procese buvo antraeilis – į juos buvo žiūrima kaip į išorinį žinių šaltinį pramonei. Taip pat universitetų, kaip specifinės institucijos, inovacinių pajėgumų analizė buvo praleista ir atliekant organizacijos pajėgumų tyrimus.

Nagrinėjant vidinės ir išorinės aplinkos veiksnius, turinčius įtakos inovaciniam procesui, matyti, kad ne visi veiksniai turi vienodą poveikį organizacijai. Priklausomai nuo organizacijos tipo, jos veiklos srities ar dydžio vienų veiksnių poveikis gali būti silpnas, kitų – lemiamas organizacijos inovacinei veiklai. Atskirai paėmus, organizacijos gebėjimai, ištekliai ir specifinis turtas, pvz., žinomumas, reputacija, išsilavinę darbuotojai, nekuria vertės, tačiau privalo būti sujungti ir integruoti į organizacijos procesus, kad didintų jos pajėgumą (Grant). Remiantis tuo dalis mokslininkų nagrinėjo organizacijos inovacinius pajėgumus resursų procesų–vertybių požiūriu (Teece ir kt.; Cristensen ir Raynor; Serger ir Hanson; Conway ir Steward) identifikuodami esminius veiksnius ir pateikdami juos apibūdinančius rodiklius. Kiti (Grant; Hunger ir Wheeles) į inovacinius pajėgumus žiūrėjo kaip į organizacijų strategiją lemiančių vidinės aplinkos veiksnių sudedamąją dalį, leidžiančius nustatyti organizacijos silpny-

bes ir stiprybes bei numatyti galimybes ir apsisaugoti nuo grėsmių. Nuo XX a. devintojo dešimtmečio dalis mokslinių tyrimų fokusuojasi į universitetų, kaip žinių visuomenės ar inovacijų sistemos sudedamosios dalies, valdymo ir pačios jų misijos transformaciją pokyčių laikotarpiu (Etzkowitz ir Leydesdorff; Clark; Rinne ir Koivula). Universitetai nagrinėjami kaip specifinės organizacijos (Golish ir kt.; Pounder; Ramsden; Rowley ir Sherman; Shattock), siekiama ieškoti jų panašumų ir skirtumų su rinkoje veikiančiomis verslo organizacijomis, žiūrima į perspektyvas ir kliuvinius, bandoma surasti ir pateikti priemones, kurios tiktų universitetams valdyti, stiprinant jų kaip organizacijų kompetencijas ir veiksnumą pokyčių / transformacijos laikotarpiu. Atskirai galima išskirti universitetų trečiosios misijos – verslumo ir inovatyvumo atsiradimo, įgyvendinimo ir padarinių universitetų bendruomenei tyrimus (Brennan ir kt., Clark; Laukkanen; Lowe ir Gonzalez-Brambila; Martinelli ir kt.; Slaughter ir Leslie) bei tyrimus, susijusius su universitetų intelektualinio produkto komercializavimu (Aguirre ir kt.; O'Gorman ir kt.; Van Burg ir kt.).

Lietuvos mokslininkai taip pat nagrinėjo įvardytas temas, kartais apibendrindami, kartais pritaikydami Lietuvos kontekstui. Nors daugiausia inovacijų tyrimai Lietuvoje koncentravosi į inovacijų skatinimo politikos analizę (Jucevičius ir kt., Daujotis ir kt.; Adekola ir kt., Melnikas), tačiau buvo atlikta ir tyrimų, susijusių su žinių valdymu (Atkočiūnienė; Jucevičius ir Ilonienė; Girdauskienė ir Savanevičienė), kūrybiškumo skatinimu (Poškienė; Ganusauskaitė ir Liesionis), ekonominių veiksnių įtaka inovacijoms versle (Keršys), vadybinio potencialo analize (Diskienė ir kt.; Diskienė ir Marčinskas). Lietuvos mokslininkai taip pat atliko ir universitetų, kaip žinių sistemos sudedamosios dalies, transformacijų periodu tyrimus: nagrinėdami elitinio aukštojo mokslo tapimo masiniu (Gudaitytė, Jucevičienė), dėstytojų požiūrio į institucijos veiklą bei akademines vertybes (Kardelis ir kt.), universitetų valdymo problemas (Mikalauskas ir Švagždienė).

Tačiau dauguma išvardytų užsienio ir Lietuvos mokslinių tyrimų koncentruojasi ties vienu ar keliais inovacijų procesui darančiais įtaką veiksniais, universitetų valdymo modeliais, universitetų kaip sudedamosios inovacijų sistemos dalies įtaka inovacijų sistemai, t. y. šie tyrimai neleidžia atskleisti sisteminio, daugianario ir daugiakanalio veiksnių poveikio universitetų inovaciniam potencialui (IP). Taip pat pati potencialo sąvoka pateikiama skirtingai pagal tam tikrą mokslininko nagrinėtos temos sąsają su IP, kartais IP pateikiamas labai siaurai

– vertinant tik žmogiškuosius organizacijos išteklius ir turimą įrangą. Universitetų, kaip savitos, ypatingu kolektyviniu sprendimų priėmimu, istorinėmis tradicijomis, deklaruojamais tikslais ir misijomis pasižyminčios organizacijos, IP apibendrinančiu, išskiriančiu universitetų specifiką požiūriu bei akcentuojant skirtumus nuo kitų organizacijų, nagrinėtas nebuvo. Nepaisant mokslinių tyrimų gausos, pasigendama kompleksinių įvairių sričių tyrimų, integruojamų per universitetų inovacinį potencialą, analizės. Nėra susisteminti inovacinį potencialą parodantys esminiai elementai bei nėra pateikta sistema priemonių ir būdų tiems elementams formuoti ir stiprinti. Savo tyrimu autorius siekė iš kiekvienos paminėtos nagrinėjamos mokslinės problemos surasti atskirus teiginius, veiksnius ir požymius, išskirti esminius bei juos kompleksiškai sujungti (kiek buvo įmanoma) ir parodyti jų svarbą ir vietą formuojant universiteto IP. Šiuo jungiančiu ir apibendrinančiu aspektu mokslinių tyrimų iki šiol nebuvo atlikta.

Darbo tikslas **–** atskleisti ir pagrįsti universitetų inovacinį potencialą apibrėžiančius veiksnius bei pateikti sistemą priemonių universitetų IP formuoti ir stiprinti.

Darbo tikslui pasiekti suformuluoti tokie uždaviniai:

1. Išnagrinėjus mokslinę literatūrą, pateikti organizacijų IP sampratą.
2. Atskleisti universiteto, kaip specifinės organizacijos, požiūrių į verslumą bei inovatyvumą savitumą.
3. Apibrėžti inovatyvaus universiteto apibūdinimą ir nustatyti prielaidas universitetui būti inovatyviam.
4. Nustačius išorinės ir vidinės aplinkos veiksnių poveikį organizacijos IP, pateikti organizacijos prioritetų ir galimybių, turinčių įtakos kilusiai idėjai, santykių variantus.
5. Atlikus Lietuvos IP būklės tyrimą, identifikuoti esminius veiksnius, turinčius įtakos šalies IP lygmeniui, ir parodyti jo sąveiką su universitetų IP.
6. Atlikus universitetų IP mechanizmo funkcionavimo prielaidų ir universitetų inovatyvumo galimybių empirinį tyrimą, įvertinus tiriamų universitetų inovacinę veiklą, jos stiprybes bei silpnybes, papildyti teorines prielaidas universitetų transformacijai į inovatyvius, pateikiant priemones formuoti ir stiprinti jų IP.

Mokslinio **tyrimo objektu** buvo pasirinktas socialinis artefaktas – inovacinė veikla, o tiriamas dalykas – universitetų inovacinis potencialas ir jo formavimo priemonės. Tyrimų baze tiriant inovacinio potencialo priemonių funkcionavi-

mo prielaidas buvo pasirinkti trys inovatyviausi Lietuvos universitetai – Kauno technologijos universitetas, Vilniaus Gedimino technikos universitetas ir Vilniaus universitetas.

Tyrimo metodai / instrumentai. Mokslinės literatūros lyginamoji ir sisteminė loginė analizė buvo taikyta tiriant ir analizuojant inovacijų procesą, inovacijas veikiančius veiksnius, nustatant IP sudėtį. Remiantis šia analize, sintetinant, abstrahuojant, pritaikius dedukcinius metodus, susisteminus ir suklasifikavus buvo sudarytas siūlomasis universitetų IP elementų sąrašas. Siekiant išsiaiškinti IP šalies ir atskiro universiteto mastu dydį, nacionalinės inovacinės sistemos dalyvių sąveiką, išreikštą statistiniais dydžiais, arba tai, kad tokios sąveikos nėra, moksliniam inovaciniam procesui turinčius įtakos teisės aktus ir universitetų vidaus normatyvinius dokumentus, buvo naudojama turinio analizė, kurią būtų galima suskirstyti į: a) dokumentų analizę ir b) statistinių duomenų analizę. Trečias naudotas tyrimo instrumentas – ekspertų apklausa. Šis tyrimo instrumentas buvo naudotas dėl tyrimo temos savitumo ir pakankamo naujumo Lietuvos kontekste. Ketvirtas instrumentas buvo anketinė apklausa paštu. Anketinės apklausos paštu adresatai buvo parinkti remiantis Triple Helix principu: valdžios, verslo ir universitetų atstovai. Šis instrumentas kartu su ekspertų apklausų duomenimis turėjo padėti detalizuoti ir prioritetizuoti remiantis mokslinės literatūros analize sudarytų priemonių sąrašą. Taip pat buvo svarbu įvertinti, kaip problemą vertina skirtingų visuomenės sluoksnių atstovai, kur jų visų pažiūros sutampa, o kur kardinaliai priešingos. Apibendrinant apklausų tyrimo duomenis naudota SPSS (angl. *Statistical Package for the Social Sciences*), Microsoft Excel programos. Gauti visais metodais tyrimo duomenys sujungti indukcinio samprotavimo (t. y. nuo atskirų dalykų prie bendrų) metodu ir pateikti išvadose.

Darbo naujumas ir mokslinė reikšmė

1. Atskleistas ir argumentuotas universiteto IP resursų ,procesų, vertybių požiūriu.
2. Įvardyti ir pagrįsti IP esminiai elementai. Nustatyta, kad universitetuose vertybėmis grįsti veiksniai yra svarbesni nei technologijos ir įrengimai, o vadovybės elgsena yra lemianti tarp vertybėmis grįstų veiksnių.
3. Šalia kitų mokslininkų pateikiamų *paslaugų, korporacinio, verslaus, Mcuniversitetų* koncepcijų pateikiama išsami *inovatyvaus* universiteto koncepcija,

kurios pagrindą sudaro holistinis požiūris į inovacinį potencialą apibūdinančius elementus – kūrybiškumą skatinanti organizacinė kultūra, inovacijas palaikantis ir dalyvaujantis vadovybės elgesys, aiškiai nuolatiniam organizacijos atsinaujinimui skirta lyderystė, plokščios ir lanksčios visokeriopai aprūpintos informaciniais srautais vidinės struktūros, motyvuotas ir į inovacijų kūrimą įtrauktas kvalifikuotas personalas bei valdomos pagrindinės organizacijos žinios ir kompetencijos.

4. Pateiktas ir, remiantis Lietuvos universitetų empirinio tyrimo rezultatais, papildytas IP stiprinimo, formavimo mechanizmas, apimantis susijusias organizacines, informacines, kultūrines-socialines ir finansines priemones.
5. Pirmą kartą Lietuvoje universitetų inovacinė veikla buvo nagrinėta kaip svarbi, specifinė ir esanti šalia studijų ir fundamentaliojo mokslo universitetų veiklos dalis.
6. Tyrimo rezultatai gali būti pagrindas kuriant universitetų inovacijų valdymo modelį.

Praktinis darbo reikšmingumas

1. Pasiūlytą IP formavimo ir stiprinimo mechanizmą galima pritaikyti skirtingų tipų mokslinėse organizacijose, kurios nori atlikti savo organizacijos IP analizę bei ja remiantis nustatyti organizacijos inovacinės veiklos silpnybes, stiprybes, grėsmes ir galimybes. Be to, daugelis pasiūlytų priemonių gali būti naudojamos ir verslo įmonėse.
2. Universitetai, siekiantys kurti savo inovacijų valdymo sistemą, gali pasinaudoti IP stiprinimo, formavimo ir ryšio su kitais elementais siūlomomis organizacinėmis, informacinėmis, kultūrinėmis, socialinėmis ir finansinėmis priemonėmis, pritaikydami jas atsižvelgiant į savo universiteto strateginius tikslus.
3. Pasiūlytas universiteto MTTP veiklos strateginis valdymo modelis kartu su atliekama IP SSGG analize gali tapti pagrindu universiteto tapimo inovatyviu universitetu strategijai rengti ir įgyvendinti.
4. Atlikta šalies IP universitetams įsitraukiant į inovacinį procesą analizė atskleidė esmines žemo šalies IP lygio priežastis. Tų priežasčių identifikavimas leidžia numanyti veiksmus, kurių turi imtis šalies politikai, universitetų vadovai, verslo įmonių vadovai IP šalies mastu stiprinti bei (tam tikrais atvejais) formuoti.

5. Tyrimo metu atskleistas tiesioginis silpno šalies ir tiriamų universitetų IP lygio ir darbuotojų, atliekančių inovacijas, motyvacijos bei vidinių procesų universitetuose nebaigtumo ryšys. Empirinio tyrimo metu nustatyti pagrindiniai šalies mokslininkų motyvai – asmeninio tobulėjimo galimybė, piniginis atlygis ir įdomus darbas (procesas). Šie motyvai skiriasi nuo Vakarų šalių tyrėjų nustatytos mokslininkų motyvacijos – pripažinimo mokslinėje bendruomenėje ir troškimo gauti papildomą finansavimą tyrimams. Atsižvelgiant į tokį požiūrių skirtumą, reikia gilesnių motyvacijos tyrimų, siekiant nustatyti skirtingumo priežastis.

IŠVADOS IR PASIŪLYMAI

1. Apibendrindamas organizacijų potencialą ar pajėgumus aprašančių mokslininkų darbus, disertacijos autorius įvardija du pagrindinius potencialo ar pajėgumų skirstymus. Pirmasis – į *materialųjį* ir *nematerialųjį*, antrasis – į *resursus, procesus ir vertybes* (santrumpa RPV). Pirmasis skirstymas, disertacijos autoriaus nuomone, yra paprastesnis, tačiau per platus, kad galėtų atspindėti visą nematerialiojo kapitalo gamą, be to, siauriau nematerialusis kapitalas dažnai suprantamas vien kaip nematerialiosios vertybės – licencijos, patentai, įgytos teisės ir pan. Antrasis skirstymas (RPV) – yra išsamesnis ir inovatyvios organizacijos atžvilgiu yra tikslesnis, nes pabrėžia tris pagrindines inovacinio proceso sudedamąsias dalis. Antrojo skirstymo silpnoji dalis ta, kad jei vertybes ir procesus, palyginti su pirmuoju skirstymu, galėtume priskirti nematerialiajam kapitalui, tai resursai yra gana plati sąvoka, apimanti ne tik finansines lėšas, materialines vertybes, bet ir žmogiškąjį kapitalą, ir įgytas žinias, ir organizacijos struktūrą, ir technologijas.
2. Literatūros analizė parodė, kad universitetai yra specifiniai ir išskirtiniai inovacijų sistemos dalyviai, juose inovacinis procesas labai retai pereina visą ciklą. Dažniausiai įvedimo į rinką ir grįžtamojo ryšio užtikrinimo etapus universitetai perduoda verslo įmonėms arba tam tikrais atvejais – savo kuriamoms įmonėms. Universitetuose inovacinis procesas susitelkia ties idėjų generavimo, jų atrinkimo, dizaino ir plėtros, testavimo ir kartais bandomojo prototipo ar gaminio gaminimo etapais. Todėl, disertacijos autoriaus nuomone, veiksniai ir pajėgumai, turintys didesnę įtaką gaminio gamybos ir įvedimo į rinką etapams, gaminio gyvavimo ciklo vadybos etapui nėra tiek svarbūs universitetams, kaip veiksniai ir pajėgumai, lemiantys pirmuosius etapus.

3. Mokslinės literatūros analizė parodė, kad siekiant, jog inovacijos vyktų organizuotai, privalo būti inovatyvi organizacija bei atliekamas strateginis vadovavimas. Mokslininkai pateikia inovatyvios organizacijos apibūdinimą bei prielaidas jai tokiai būti: 1) sugebėjimas priimti ar kurti žinias, 2) sugebėjimas transformuoti žinias į produktus ir paslaugas, 3) noras inovuoti. Sugebėjimas transformuoti žinias bei noras inovuoti apibūdinami daugeliu rodiklių, tačiau disertacijos autorius įvardija pagrindinius, kuriuos sieja su resursų, procesų, vertybių (RPV) požiūriu į organizacijų potencialą ir tai būtų – **pakankami kvalifikuoti organizacijos žmogiškieji ištekliai**, **organizacijos kultūra**, skatinanti kūrybiškumą ir nuolatinį organizacijos ir jos narių mokymąsi, organizacijos narių **polinkis į verslumą** ir **vadovybės parama inovacijoms**. Norint sugebėti priimti ir kurti žinias, taip pat reikia kvalifikuotų žmogiškųjų išteklių, tačiau vien jų neužtenka – šalia to turi būti ir **išvystyta organizacijos mokslo bazė.** Remdamasis tuo disertacijos autorius siūlo tokį inovatyvaus universiteto apibūdinimą – *tai būtų sugebantis gauti ir gaminti žinias universitetas, turintis pakankamai kvalifikuotų žmogiškųjų išteklių bei kūrybiškumą skatinančią organizacinę kultūrą, kurie teikia galimybių įgytas ir sukurtas žinias transformuoti į pritaikomas, o turėdamas polinkį į verslumą sugeba jas komercializuoti.*
4. Universitetų specifiškumą ir išskirtinumą iš kitų inovacinės sistemos dalyvių apibūdina ir pakankamai didelis kiekis vienoje vietoje sukauptų didžiulių žmogiškųjų ir informacinių išteklių, o tai leidžia, pasitelkus gerus bendradarbiavimo ryšius su išoriniais partneriais, imtis kompleksinių inovacijų.
5. Universitetų transformavimasis į inovatyvų verslų universitetą nėra neišvengiamas ir, disertacijos autoriaus nuomone, ne visi universitetai transformuosis, ypač greitai nesikeis tie, kurie turi garantuotą valstybinį finansavimą ir kurių vizija ir misija ne praktinis žinių panaudojimas, o žinijos sklaida. Tačiau tie, kurie tai padarys greičiau, įgis konkurencinį pranašumą.
6. Nėra ir negali būti tipinio būdo tapti inovatyviu universitetu – tą kiekvienas universitetas turi pats nuspręsti, išgyventi ir pritaikyti. Ir ne visada tik vidinės suderintos priemonės tai lemia – privaloma atsižvelgti į išorinės aplinkos veiksnius, laiko veiksnį. Tačiau kartu privalu atsižvelgti, kad universitetas neveikia nuo starto pozicijos – jis veikia kaip institucija, turinti savo istoriją, tradicijas, susiformavusias vertybes, todėl, pradėjus keisti išorinę aplinką ir ją padarius skatinančią ir remiančią inovacijas, šis procesas universitete gali

būti nesuprastas, jis bus sabotuojamas ar jam atvirai priešinamasi, nenorint keisti nusistovėjusių įpročių. Atsižvelgdamas į tai, disertacijos autorius daro išvadą, kad pokyčiai vidinėje universitetų aplinkoje ir pokyčiai išorinėje aplinkoje, skatinantys universitetų inovatyvumą ir verslumą, turi būti adekvatūs, o radikalūs pokyčiai inicijuotini tik turint akademinės bendruomenės daugumos palaikymą.

7. Kai inovaciniame procese įeigos rodikliai – žmogiškieji ištekliai, finansavimas, žinios yra pakankamai geri, o rezultatas – pažangios technologijos, patentai, pumpurinės įmonės – blogas, darytina išvada, kad tai lemia ne dar didesnių finansų trūkumas ar naujų žmonių priėmimas, o nesutvarkyti vidiniai universitetų procesai, iš kurių svarbiausi būtų: komunikacija, koordinacija, galimybių paieška, darbuotojų motyvavimas.
8. Mokslinėje literatūroje įvardyta viena iš esminių gana didelio universitetų nenoro keistis priežasčių – tai uždara hierarchinė mokslinių institucijų sistema. Skirtingai nuo valdžios ir verslo atstovų nuomonės, kad tai viena iš pagrindinių žemo šalies inovatyvumo lygio priežasčių, ši nuostata universitetų atstovų tyrimo metu nebuvo palaikyta. Tačiau kitų rodiklių – žmogiškojo potencialo arba dalies kitų *įvesties* rodiklių vertinimas, kurį pateikė universitetų atstovai, ir akivaizdus šio vertinimo skirtumas nuo kitų visuomenės grupių vertinimo ir ypač nuo statistikos duomenų teikiamų palyginimų parodė ir leido kelti prielaidą, kad mokslininkai tiesiog nesuvokia prastos padėties. Universitetai ir kiti inovacinės sistemos dalyviai – valdžia ir verslas turi skirtingą supratimą ir tam tikrų vykstančių procesų vertinimo prioritetus. Tai lemia lėtą, kontroversišką tam tikrų priemonių taikymą, nes per staigus ar nepasvertas jų taikymas sukelia kitų dalyvių pasipriešinimą ar abejingumą. Tokia prielaida leidžia manyti, kad problemos nesuvokimas gali būti didelė socialinė kultūrinė kliūtis orientuojant universitetus inovatyvumo ir verslumo link.
9. Pagal teorinius mokslininkų darbus pastovus turtas – pastatai, įrengimai nėra išskirtinė organizacijų kompetencija, ir disertacijos autoriui atlikus priežasčių inovacinio potencialo lygio universitetuose tyrimus, tai buvo patvirtinta valdžios ir verslo atstovų. Atlikęs lyginamąją kiekybinių duomenų ir apklausų rezultatų analizę tiriant universitetų inovacinio potencialo veiksnių svarbą, disertacijos autorius daro išvadą, kad vertybėmis grįsti veiksniai yra svarbesni nei technologijos ir įrengimai, o vadovybės elgsena yra lemianti tarp vertybėmis grįstų veiksnių. Dviejuose iš trijų tiriamų Lietuvos universitetuose šis veiksnys yra silpniausia inovacinio potencialo mechanizmo dalis.

10. Lietuvos mokslininkų, tyrusių šalies verslo įmonių organizacinę kultūrą, išvados, kad Lietuvos verslo įmonėse nėra išnaudojami vidiniai šaltiniai inovacijoms kurti, šie šaltiniai neturi vadovybės palaikymo, nėra skatinami vidinės organizacijos kultūros ir darbuotojai nemato motyvų, kodėl tai turėtų daryti, – šio tyrimo metu patvirtintos ir Lietuvos universitetams.
11. Tiriamuose universitetuose viešai išreikšti ar komunikuoti universitetų vertybinės nuostatos, strateginiai tikslai, vadovybės dėmesio zonos, dėmesys intelektinei nuosavybei, darbuotojų motyvavimo schemos, dėmesys verslumui, atskirų padalinių integracinis mechanizmas yra nepalankūs inovacijų procesui vykdyti. Tačiau yra ir palanki pozicija, kuri pasireiškia sprendimų priėmimo procedūromis atskiruose, ypač santykinai nedidelės vertės projektuose, lanksčiomis mokslo projektų ir atskirų mokslininkų lygiu struktūromis. Taip pat pozityviu galima laikyti informacinį aprūpinimą, dėmesį informacijos kaupimui, universitetų investicijoms į informacines sistemas.
12. Dauguma verslo idėjų į universitetus atėjo per mokslininkus verslininkus, tačiau iki šiol tiriamiems universitetams dar yra sunku teisiškai sureguliuoti mokslininkų verslininkų ir universiteto santykius tyrimų atskleidimo, laiko verslui ir universitetui išdėstymo, universitetų išteklių naudojimo, intelektinės nuosavybės priklausomybės ir kitais klausimais. Tirtuose Lietuvos universitetuose R. B. Clark įvardytos versliam universitetui būdingos savybės: 1) vadovavimo stiprinimas; 2) periferinių vienetų, kurie veikia už tradicinių universiteto sienų, išvystymas ar tarpdisciplininių mokslo centrų integravimas į lanksčią organizacinę sistemą; 3) finansavimo šaltinių ir srautų diversifikavimas; 4) stimuliuojamas mokslinis (akademinis) pagrindas; 5) integruojama verslumo kultūra nėra išplėtotos, tačiau verslumas tyrėjų, bent jau techninių, technologinių ir fizinių mokslų tyrėjų, vertinamas palankiai. Šiuo palankumu universitetuose turi būti pasinaudota integruojant verslumo kultūrą į universitetų gyvenimą.
13. Prie svarbiausių kliūčių inovatyviai ir versliai universitetų veiklai visų trijų respondentų grupių buvo įvardyta baimė finansiškai rizikuoti. Atsižvelgiant į tai, kad individualaus mokslininko prie svarbiausių priežasčių, kliudančių imtis verslo, taip pat įvardyta baimė, kad būsima įmonė neturės komercinės sėkmės, kuri buvo antra po startinio kapitalo gavimo, verčia manyti, kad inovatyviai organizacijai būdingą savybę rizikuoti ir toleruoti riziką universitetai dar turės išsiugdyti.

14. Baimė rizikuoti, keisti mąstymą, kad universitetai taip pat gali imtis tyrimų komercializavimo, yra pagrindiniai stabdžiai kelyje į verslų universitetą. Pasikeitus politinei aplinkai, suteikiant daugiau teisių disponuoti savo turtu, pagaliau suteikiant teisę į sveiką riziką ir toleruojant nedideles klaidas, kartu keičiant mąstymą ir drąsinant darbuotojus dalyvauti kuriant verslo vienetus, tam panaudojant mokslininkų verslininkų patirtį, organizuojant trūkstamų teisinių ir finansinių žinių įgijimą – yra vilties, kad baimės bus įveiktos ir trečioji – verslaus universiteto misija bus įgyvendinta. Šiai misijai skinantis kelią, universitetai turės identifikuoti ir aiškiau nusakyti savo misiją bei tikslus – kiek jie norės būti verslūs ir kokia forma ar kelios iš jų geriausiai atitinka verslaus universiteto poreikius.
16. Tyrėjus kurti naujas žinias ir technologijas daugiausiai motyvuoja asmeninio tobulėjimo galimybė, piniginis atlygis ir įdomus darbas (procesas). Šie motyvai skiriasi nuo Vakarų šalių tyrėjų pirminės motyvacijos – pripažinimo mokslinėje bendruomenėje.
17. Skatinant ekonominį ir kultūrinį regiono patrauklumą ir plėtrą, nėra išnaudojamas konkurencingumas ir socialinis kapitalas dėl skirtingų dalyvių: universitetų, savivaldybių, verslo įmonių prioritetų ir todėl, kad nėra tokio bendradarbiavimo tradicijų, vadinasi, bendrų prioritetų ieškojimas, jų identifikavimas ir komunikavimas visiems inovacinės sistemos dalyviams, kartu kuriant bendradarbiavimo tradicijas yra esminė regiono pažangos skatinamoji jėga. Siekiant, kad politinė, švietimo ir pramonės sistemos veiktų kaip vieninga inovacinė sistema, būtina infrastruktūra, kuri pasireiškia prieinamumu prie kreditavimo ar finansavimo šaltinių, intelektiniais ištekliais ir išvystyta informacine sistema tarp skirtingų inovacinės sistemos dalyvių, taip pat per inovacijų ir verslo skatinimo sistemas bei per veikiančius standartus ir elgesio normas.

ABOUT THE AUTHOR

In 1984–1991 Gintaras Binkauskas studied at the Vilnius Technical University (present Vilnius Gediminas Technical University) and acquired the qualification of engineer-economist. After graduation until 2006, he worked at various business enterprises as an economist, finance director and company manager. From 2006 till now works at the Vilnius University as Director of Finance and Economics. 2007–2011: doctoral studies in Management and Administration at the Faculty of Economics, Vilnius University. Spheres of scientific interest: academic entrepreneurship, management of innovation, management of universities. Since 2005 member of the Association of Financial Analysts (Lithuania).