Tomas Bata University in Zlín
Faculty of Management and Economics

Doctoral Thesis

Entrepreneurial University in the Development of “Innovative regions”

Podnikatelská univerzita v rozvoji "Inovačních regionů"

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ABSTRACT

Changes in global and regional economic conditions have induced state and regional economic development agencies in economically advanced nations to invest in strategies to leverage the emerging knowledge-based economy in their regions. These strategies included efforts to attract and retain industries and innovative firms, to imbue the labor force with the skills needed for higher productivity in the knowledge economy, and to enhance regional abilities to adjust in the face of rapidly changing economic conditions. Innovational region is the response to the challenges of new economic environment, being the foundation of knowledge based economy.

The Triple Helix Model was developed by H. Etzkowitz and L. Leydesdorff, to define regional transformation mechanisms in an innovative region, whose economic growth is based on knowledge. Etzkowitz holds the opinion that an entrepreneurial university plays a key role in forming an innovative region.

A university represents an educational - entrepreneurial phenomenon, incorporating business, information, knowledge, science, high-tech industry and education interacting with each other. The changed roles and status of a university necessitated the development of new approaches to management, which in their turn lead to the need to train and retrain their personnel to help them apply the management principles key to innovation and entrepreneurship.

This research is focused on the Triple –Helix model as the most important concept in the regional development , an entreprenerial university as the key element of the Triple- Helix model, university transformation into "Enterprise Organisation", its positioning in a region and on education market becoming a highly topical theme of dissertational research.

Key words: Innovation, Region, Triple-Helix, Entrepreneurship, Entrepreneurial University, Management.

ABSTRAKT

Změny v globálních a regionálních ekonomických podmínkách přiměly státní a regionální ekonomický rozvoj agentur u hospodářsky pokročilých národů, aby investovaly do strategií s nasazením nové znalostní ekonomiky v jednotlivých regionech. Tyto strategie zahrnuly snahy o přilákání a udržení průmyslu a inovačních firem, aby si pracovní síly osvojili dovednosti potřebné pro vyšší produktivitu v oblasti znalostní ekonomiky a posílení regionální schopnosti přizpůsobit se tváří v tvář rychle se měnícím ekonomickým podmínkám. V době světové krize se poptávka po podnikatelsky kvalifikovaných lidech stala značně důležitou. Každý podnikatel je schopen vytvářet podnikatelskou organizaci, a to povede ke vzniku nových pracovních míst, jak navrhoval Baťa mladší. Nový vývoj a podniky jsou schopny nahradit staré nekonkurenceschopné firmy, což by v budoucnu znamenalo ekonomický růst.

Inovační region je odpovědí na problémy nového ekonomického prostředí, což je základem pro ekonomiky založené na znalostech. Model trojité spirály (Triple-Helix Model) byl vyvinut H. Etzkowitzem a L. Leydesdorffem, aby definoval transformace regionálních mechanismů v inovační oblasti, jejichž hospodářský růst je založen na znalostech. Etzkowitz zastává názor, že podnikatelská univerzita hraje klíčovou úlohu při formování nového kraje. Univerzita představuje pedagogicko-podnikatelský fenomén, který představuje obchod, informace, znalosti, vědu, high-tech průmysl a školství ovlivňující se navzájem. Změněná role a postavení vysokých škol vyžaduje rozvoj nových přístupů k řízení, které zase vede k nutnosti vzdělávání a rekvalifikaci svých pracovníků, aby jim pomohly uplatnit principy řízení v inovaci a podnikání. Tento příspěvek je zaměřen na model trojité spirály jako nejdůležitější pojem v regionálním rozvoji, podnikatelská univerzita jako klíčový prvek pro model trojité spirály, univerzitní transformace do "organizace podniku", svou polohou v regionu a na trhu vzdělání se stává velmi aktuálním tématem pro disertační výzkum.

Klíčová slova: Inovace, Region, Triple-Helix Model, Podnikání, Podnikatelská Univerzita, Management.

ROZŠÍŘENÝ ABSTRAKT

Společný cíl znalostního ekonomického rozvoje všude ve světě je vytvoření nových oblastí. "Inovační region má schopnost se pohybovat po celých technologických paradigmatech a pravidelně se obnovovat prostřednictvím nových technologií a firem vzešlých z jeho akademické základny" (Etzkowitz, 2002) [1]. Zahájení modelu trojité spirály (Triple Helix) – univerzita – průmysl - vláda - může být považováno za klíčový faktor regionálního rozvoje. "Cílem modelu trojité spirály je identifikace konkrétních mechanismů a institucionálních vztahů, jejichž prostřednictvím tato transformace probíhá" (Etzkowitz, 2003) [2]. Model trojité spirály byl vyvinut za účelem definovat regionální transformace mechanismů v inovačním regionu, jejíž ekonomický růst je založen na znalostech. Jak bylo analyzováno Etzkowitzem, podnikatelská univerzita je novým typem zařízení, které se vyvíjí v důsledku intenzivní interakce mezi dříve izolovanými oblastmi na vysoké škole, v průmyslu a státní správě. Etzkowitz zastává názor, že podnikatelská univerzita hraje klíčovou roli ve vytváření inovačního regionu. Akademický základ takového "inovačního regionu" poskytuje pro své schopnosti pravidelného sebe omlazení a hledání nových cest v technologickém rozvoji. "Účinnost inovací je do značné míry závislá na síti komunity a soukromých organizací vytvořené pro podporu start-up firem, financování vědeckého výzkumu a poskytnutí počátečního vkladu". (Schumpeter, 1951) [3]. Čítankovými příklady inovačních regionů je Silicon Valley (Kalifornie), Oxford a Cambridge (Velká Británie), Princeton (New Jersey), jejichž jména jsou zobrazením úspěchu. Univerzity v těchto regionech byly přímo zapojeny do založení nových společností, vlastnící výzkumné pracovníky a uvádění na trh jejich výzkumy. Tyto regiony jsou velmi atraktivní pro investování. Univerzity v těchto regionech se aktivně podílejí na budování obchodních spojení s podnikatelskou sférou - představují strategický prvek regionálního inovačního systému. Na vysokých školách je podporován podnikatelský duch mezi studenty a zaměstnanci v mnoha různých způsobech. Mění se na podnikatelské univerzity.

Podnikatelská univerzita je odpovědí na výzvu doby, kdy dostalo vzdělávání statut komerčně prodávaných výrobků, je tvořen trh mezinárodní vzdělávací služby, a univerzity jsou přeměněny na podnikatelské subjekty. Univerzita představuje pedagogicko-podnikatelský fenomén, který zahrnuje obchod, informace, znalosti, vědu, high-tech průmysl a školství ovlivňující se navzájem. Chcete-li získat podnikatelskou činnost uvnitř a kolem vysokých škol, je nezbytné rozvíjet podnikatelské smýšlení a kulturu a seznámit se s procesy podporující inovace, a překládání nejlepších inovací do projektů pro vnitřní rozvoj jako nové podniky, nebo pro případné spin-off do více volně stojících podniků na univerzitní periferii. Analýza literatury v tomto výzkumu ukazuje jakýsi směr, co by univerzita mohla a měla udělat pro vytvoření podnikatelské univerzity. Spojením práce Clarka, Etzkowitze, dalších pedagogů a literatury o podnikání vůbec můžeme identifikovat některé schopnosti a nějaké rozumné praktické modely, které udávají podstatu a jakýsi podrobný popis pro transformaci univerzity.

Existují strukturální, strategické, finanční a kulturní otázky, které se musí dostat do hry, aby rozšířily podnikatelské aktivity na vysoké škole, a to zahrnuje vedoucí a manažery, kteří musí vytvářet tyto okolnosti a znovu formovat chování, včetně jejich vlastního. Mnoho univerzit po celém světě dosáhlo významného pokroku formou podnikání, ale podrželo si své tradiční akademické role. Zkušenosti z úspěšného rozvoje evropských a ruských vysokých škol ukázaly, že neexistuje žádná alternativa pro komercializaci vzdělávací činnosti a vědeckého výzkumu, což také znamená vývoj v podnikatelském stylu organizace v rámci moderních podmínek globalizace trhu, která má vést k vyšší úrovni hospodářské soutěže na vzdělávacím trhu. Podnikatelský přístup by měl prostoupit celou univerzitu - od úrovně studentů po profesory. To znamená podporu konkrétního stavu mysli a intelektuální přístup k vědě a komunitě, jež by umožnila rychlé reakce na nadcházející problémy a přijímání nových myšlenek.

Těžením z modelu trojité spirály může Zlínský kraj dosáhnout jeho hlavní ekonomický cíl: poskytnout dobře fungující infrastrukturu a zvýšit kvalitu života této komunity. To může být dosaženo prostřednictvím vytvoření podnikatelské

univerzity schopné vytvořit silné vazby mezi podniky-státem-univerzitou a místní komunitou. Univerzita Tomáše Bati se stala jedním z hlavních přispěvatelů do regionální ekonomiky, významným regionálním zaměstnavatelem a kupujícím služby. Univerzita slouží jako mimořádně úrodná půda pro inovace kvůli svému velkému lidskému kapitálu zastoupeným přílivem studentů - zdroj potenciálu vysoce kvalifikovaných lidských zdrojů. Vysoká škola funguje jako inkubátor poskytující studentům a učitelům podmínky pro pokusy všeho druhu-intelektuální, politické, obchodní a jejich kombinace. Jako podnikatelská univerzita bude sloužit jako potenciální skleník na růst nových interdisciplinárních vědeckých oborů, nových odvětvích průmyslu, které mají přispět k místnímu regionálnímu růstu. Model vyvinutý v tomto výzkumu má potenciál být ještě upřesněný a upravený pro jednotlivé univerzity, a to v závislosti na fázi jejich vývoje, velikosti a celkové úrovně schopností. Jejím příslibem je poskytnutí konceptuálního základu pro další zkoumání a manažerskou praxi, a pokud podporuje a pomáhá některým vrcholovým manažerům univerzit, jak lépe řešit otázky způsobilosti, pak se jí podařilo splnit to, co si tato studie klade za cíl.

Bloky nakresleného modelu vytvořeného autorem byly sestaveny na základě analýzy podniku a podnikatelské literatury, praktických příkladů ze světových univerzit.

Výsledky jsou diskutovány na konferencích a s manažery a odborníky z vysokých škol, podniků a státních organizací.

Byla dosažena rozsáhlá analýza metod managementu, podnikové kultury, strategického, finančního a vědeckého řízení.

Některé podnikatelské přístupy jsou používány již několika univerzitami, ale autor tohoto výzkumu odvedl velký kus práce při hledání těchto příkladů, vědecké zdůvodnění nutnosti použití vybraných metod řízení na vysokých školách, jejich použitelnost v oblasti vzdělání a jako dané metody byly podle autora sjednoceny pro jejich využití při transformaci univerzit pro další úspěšný rozvoj univerzity a regionu.

INTRODUCTION

The common objective of knowledge-based economic development efforts everywhere in the world is the creation of an innovative region.

“An innovative region has the capability to move across technological paradigms and periodically renew itself through new technologies and firms generated from its academic base” (Etzkowitz, 2002) [1]. Initiation of the Triple Helix – university- industry- government - may be considered as a key factor of regional development. “The objective of the Triple Helix Model is the identification of the specific mechanisms and institutional relationships, through which this transformation takes place” (Etzkowitz, 2003) [2].

The Triple Helix model was developed to define regional transformation mechanisms in an innovational region, whose economic growth is based on knowledge. As analyzed by Etzkowitz, an entrepreneurial university is a new type of institution which is evolving as a result of an intensive interaction between previously isolated spheres of a university, industry and government. Etzkowitz holds the opinion that an entrepreneurial university plays a key role in creating an innovational region. The academic foundation of such an “innovational region” provides for its ability of regular self-rejuvenation and finding new ways in technological development. «The effectiveness of innovation is largely dependant on a network of community and private organizations created to support start-up firms, to finance scientific research and to furnish initial stock». (Schumpeter, 1951) [3].

The reading-book examples of innovative regions are Silicon Valley (California), Oxford and Cambridge (Great Britain), Princeton (New Jersey), their names being the images of a success story. The universities in these regions were directly involved in establishing new companies, possessing research personnel and marketing their research developments. These regions are highly attractive to investments. The universities in these regions take active part in building commercial connections with business community – they constitute a strategic element of regional innovation system. The universities encourage

entrepreneurship among their students and staff in a variety of ways. They have transformed into entrepreneurial universities.

An Entrepreneurial University is the response to a challenge of the time when education is rendered a status of a commercially sold product, an international education services market is being formed, and universities are transformed into entrepreneurial entities. A university represents an educational- entrepreneurial phenomenon, incorporating business, information, knowledge, science, high-tech industry and education interacting with each other.

To get entrepreneurial action inside and around universities, it is necessary to develop an entrepreneurial mindset and culture, and to learn the processes of encouraging innovation, and translating the best innovations into projects for internal development as new ventures, or for eventual spin-off into more free-standing ventures on the university periphery.

Analysis of the literature in this research gives some direction to what university could and should do to create an entrepreneurial university.

By combining the work of Clark, Etzkowitz, other educators and the entrepreneurship literature at large, we can identify some capabilities and some reasonable practice models that give substance and some detailed description for university transformation.

There are structural, strategic, financial, and cultural issues that need to be brought into play to expand the entrepreneurial activity of a university, and it is leaders and managers who must create those circumstances and re-shape behaviors, including their own. Many universities all over the world have made significant progress working as entrepreneurial, but retained their traditional academic roles.

The experience with successful development of European and Russian universities has shown that no alternative exists to the commercialization of educational activities and scientific research, which also means development in the entrepreneurial style of an organization under modern conditions of market globalization, which has lead to a higher level of competition in the educational market.

The entrepreneurial approach should permeate throughout the entire university - from the students` to the professors' levels. This means encouragement of a specific state of mind and intellectual approach to science and community which would enable rapid responses to the on-coming challenges and acceptance of new ideas.

Benefiting from Triple helix model Zlin Region may achieve its main economic goal: providing a well - functioning infrastructure and increasing the community's quality of life. This can be gained through creating an entrepreneurial university able to establish the strong ties between business-government-university and the local community. Tomas Bata University has become one of the major contributors to regional economy, major regional employer and purchaser of services.

The university serves as a particularly fertile ground for innovation due to its large human capital inflow represented by students – the source of potential highly qualified human capital. The university works as an incubator providing students and teachers with the conditions to initiate new venture forms of every kind-intellectual, political, commercial, and a combination of these. As an entrepreneurial university it will serve as a potential hothouse to grow new interdisciplinary scientific fields, new sectors of industry to contribute to the local regional growth.

The model developed in this research has the potential to be further refined and adjusted for individual universities, depending on their stage of development, size and overall extended capability levels. It hopefully provides a conceptual basis for further exploration and managerial practice, and if it stimulates and assists some senior university managers to better address the capability issues, then it has succeeded in doing what this study sets out to accomplish.

CALLS FOR RESEARCH

This study is undertaken for purposes of building improved model of organisational and managerial capabilities for a Regional Entrepreneurial university and then to adoptate it to Czech context. It seeks to build and develop conceptual model, that can inform and assist improved and more informed practice for possible participants of Triple Helix model.

It aims to do this by working with concepts that can be elucidated and synthesised from the literature and then by presenting these to experienced university managers and related experts in order to improve the emerging model.

Research Objective: To develop a mechanism for the transformation of a university into a Regional Entrepreneurial University for participation in the Triple-Helix.

To achieve the research objective the following tasks should be solved:

- To identify the concepts of Regions development applied to knowledge-based economy;
- To systematize the existing domestic and foreign experience in Regional development;
- an analysis of Innovative Regions formed in the USA, European Union and Russia followed by theoretical summary of research results;
- To identify the concepts of Entrepreneurial activity, innovative entrepreneurship, as applied to an education system;
- To analyze literature and experiences of management, economics, strategic management and financial management;
- To identify approaches of management as applied to an Educational Systems;
- To systematize the existing domestic and foreign experience in creating Regional Entrepreneurial University;
- To analyze the state of university environment and define the place of Entrepreneurial University in Regional development model;

- To analyze the conceptual and regulative documentation on establishing universities;
- To develop criteria of Regional Entrepreneurial University for cooperation in the Triple-Helix;
- To formulate the basic principles for transforming a University into a Regional Entrepreneurial University;
- To create transformation model for regional Entrepreneurial University;
- To develop a plan for transforming a university into a Regional Entrepreneurial University based on the principles identified;
- To develop a questionnaire form and conduct a research interviewing with prospective participants of Triple-Helix model;
- To develop specific Regional Entrepreneurial university model for Tomas Bata University in Zlin based on Data collected in the research;
- To suggest useful recommendations for Universities which goal is to become Entrepreneurial.

Research Questions

Q1: Is The creation of an Educational – Bussiness – Government Model Triple- Helix nessesary to the development of an Innovative Region?

Q2: Could Entrepreneurship become the right resource for the development of Universities for participation in Triple-Helix?

Q3 What should be internally transformed in a traditional acadamic University to incorporate Triple Helix model for Regional develipment?

Q4: Is The Model of Regional Entreperenerial University developed in the research could be the core for University to become Entrepreneurial?

Q5: Is it nesessary to implement Triple-Helix model for successful development of Zlin region?

Q6: Is There a need for trasformation TBU into Regional Entreprenerial University?

Q7: Could the trasformation model suggested in this research be used as an instrument for trasformation of UTB into Regional Entrepereneurial University?

Blocks of the drafted Model created by the author have been constructed on the analysis of enterprise and business literature, practical world examples of universities.

The results are discussed at conferences and with managers and experts of universities, business and government organizations.

The extensive analysis of methods in management, corporate culture, strategic management, financial management, scientific management has been made.

Some entrepreneurial approaches are used by some universities already, but the author of this research has performed a great work on a finding of these examples, a scientific substantiation of necessity application selected management methods to university, their applicability in educational sphere and as the given methods have been unified by the author for their use in transformation of universities for the further successful development of university and region.

1. CHAPTER 1. LITERATURE REVIEW

1.1. Region Development

Schumpeter (1951) [3] was the first to point out that the process of innovation in a region is largely a race for monopoly control over the stream of rents from new innovations, which are essentially public goods once introduced. The literature on systems of innovation conceptualises innovation as an evolutionary and social process of collective learning (Edquist, 2004) [4].
An increasing interest has emerged in literature, which focuses on the Importance of knowledge, learning and innovation to the economic success of firms, regions and nation-states [10].

The literature of innovation is concentrated on the mechanisms of knowledge transfers and collective learning that are used to develop new ideas. Porter, (1998) [5], Malmberg, Maskell, (2002) [6] and other works point out the need for interactions and deliberate co-operations in order to co-ordinate and absorb knowledge generated by neighbours.

Porter (1990) [7] discusses how geographic clustering can be viewed as an organizing force for national industrial competitiveness. Markusen et al. (1999) [8] add additional complexity into the common conception of the flexibly specialized industrial district by emphasizing the role of large firms, state actors, local fixed capital, and the active recruitment of skilled labor in district formation. Brazeal (1996) [9] reviews relationship between public investment and regional economic growth and suggests that policymakers should proceed with caution in deriving policy prescriptions based on the evidence. Dess, G. G., G. T. Lumpkin and J.E. McGee, 1999 [10], Drucker, P. F. 1997 [11] argue that Intellectual capital is becoming as important as financial capital which is the basis of future economic growth.

In the same line among models developed the Triple Helix model offered by Etzkowitz and Leydesdorff (1997) [12] shows how universities, states, and industries that were differentiated from each other are now cooperating to create

unique institutional configurations. Nor the conversion of scientific knowledge or the emergence of the entrepreneurial university is entirely new. As early as mid 19th century the USA saw the Massachusetts Institute of Technology (MIT) pioneering the infusion of science-based engineering into industry and an institutional arrangement that was the model for Stanford in the postwar era (Etzkowitz,2002 [1]; Fagerberg, J., Mowery, D., Nelson, R., 2004) [13].

Nelson righly points out that traditional economic theory largely omits several relevant factors that account for existing differences in the rate of economic growth. These problem spheres are as follows:

– Technologies and innovations,

– Interconnectedness among enterprises and their milieu,

– Spatially rather differentiated formal and informal institutions.

The innovations, process of learning and disclosure of new approaches and new solutions constitute the key to the comprehension of existing differences in economic efficiency among particular towns and regions. The promoters of 'innovative regions' claim that the source of regional competitiveness consists from the knowledge, capability to learn and to create the cultural setting that fosters the innovations. The competitiveness is not comprehended as a price competition but as a competition based on unceasing innovations. Knowledge is perceived as the most strategic 'source' and learning as a decisive process from the perspective of competitiveness [10].

1.1.1. Triple-Helix Model

Of the models of innovation, Triple Helix is considered to be the most dynamically evolving. This model is a new framework for understanding and encouraging the innovation process. Triple helix mirrors partnerships among university, industry and the government that lead to three-sides networks and hybrid organisations. Nowadays the most popular variant of the Triple helix model is known as the Triple helix III (see Figure 1).

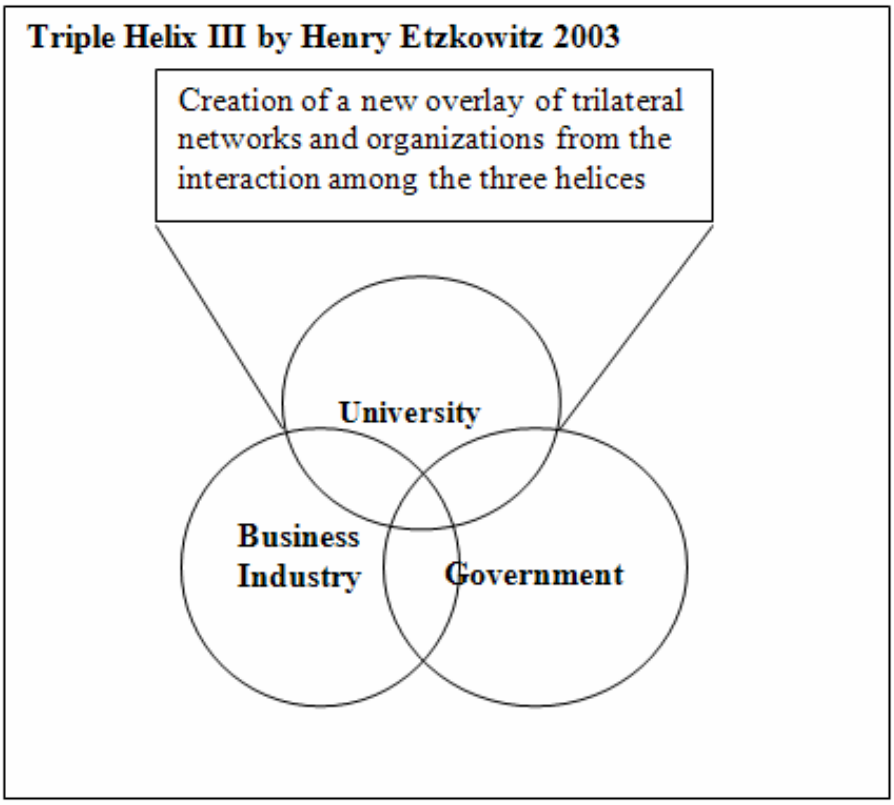

Figure 1. The Triple Helix Model

The Triple Helix model proposes that the interaction in university-industry-government is the key basis of innovation in a knowledge-based economy. University, industry and government, as relatively equal partners, are identified as the key actors in creating new networks and hybrid organisations. Industry operates in the Triple Helix as the locus of production; government as the source of contractual relations that guarantee stable interactions and exchange; the university as a source of new knowledge and technology, the generative principle of knowledge-based economies (Etzkowitz, 2002) [1].

The Triple helix model comprises three basic elements:

1) It presumes a more prominent role for the university in innovation, interacting with industry and government in a knowledge–based society.

2) There is a movement toward collaborative relationships among the three major institutional spheres in which innovation policy is increasingly an outcome of interaction rather than a prescription from government.

3) University becomes the core institution of an innovating region, as an entrepreneurial university, taking some of the traditional roles of industry and government.

Thus, in the Triple Helix, academia plays a role as a source of firm-formation and regional development in addition to its traditional roles as a provider of trained persons and basic knowledge. Government helps to support the new developments through changes in the regulatory environment, tax incentives and provision of public venture capital. Industry takes the role of the university in developing training and research, often at the same high level as universities.

1.1.2. World experience of the development of Triple-Helix-based Innovative Regions

Successful examples of utilizing the Triple-Helix model are represented by Silicon Valley's electronics and semiconductor industry, by the founding of Genentech and other biotechnology companies by academics and venture capitalists in the 1980s.

Other regions in other countries, such as Karlskronna Ronneby in Sweden, shifting from shipbuilding to software, and the State University of Rio de Janeiro in Friburgo, inserting an IT-based graduate school to hybridize with older technologies, have adapted this strategy to revive declining industrial regions. Another example is Long Island, where the State University of New York at Stony Brook created a biotechnology industry from the research resources available in a new medical school. The University of Twente is still regarded as the most ‘entrepreneurial’ university in the Netherlands. Every year, former students and UT employees found approximately twenty new companies. In total, there are currently already more than 300 such spin-off companies in the UT region. The UT even received a prize for this from the Ministry of Economic Affairs. These successful examples have served as an inspiration to other regions in the world.

In Russia, the transition to a market economy has led to the changes in the position of local regions and the roles their universities play in the regional development.

It might have been caused by the fact that science since the very beginning of market reforms was forced to survive in the conditions when it could hardly hope for any prospect of renewed state funding. Besides, the West has already accumulated essential experience of turning science into a commercial field by that time. Their experience revealed itself in a large number of theoretical publications on technology transfer, as well as practical work of establishing university technology parks and technology incubators.

Since the beginning of the 1990-s the most active and mobile part of domestic university community has become actively involved in commercializing the results of their scientific research. Innovative technology centers and spin-offs get started at universities. Western publications are being studied, and the original Russian articles on the theory and practice of technology transfer get published. Quite a large number of universities are prepared for the rapid transition to the principles of an entrepreneurial organization.

Tomsk region has become among the first to build up its development on the knowledge based economy [46]. Thanks to the six large universities educating for different spheres of economy the university- research lab network has been established in the region. There are serious steps being taken to enhance interconnections of business, regional government and universities in Tomsk.

The government policy for 2005-2010 has set as its priority to develop innovational universities and to merge the academic and research environment that used to function separately and lack stable relations.

The Tomsk Polytechnic University (TPU) planned its strategic development for innovation and defined 10 directions to enable the transformation into innovative university and to play the core role in the regional development [46]. Being the largest Polytechnic University in Siberia, it serves as a source of human capital for a vast territory and provides high quality knowledge production, thus

affecting the demand and supply in the regional labor market. Having established a world-wide cooperation network with academic communities the Tomsk Polytechnic University is implementing new education technologies, is developing international research laboratories and science–parks.

Close and successful cooperation of the Tomsk State University of Control Systems and Radioelectronics (TUCSR) with business environment in the field of IT technologies has become successful thanks to the transformation into an entrepreneurial university built upon the basic principles proposed by Berton Clark [47]. This university organized business incubators and science parks and is successfully training specialists in cooperation with local enterprises of corresponding profile. Government authorities provide substation support to the novel entities.

The Tomsk Region has become one of the four Russian regions to win the competition and was granted the privilege to create a Special Economic Zone for technical innovation within its territory. The Tomsk Region stands out as a unique and most promising among the for regions due to its high innovational potential represented by its six universities. Both domestic and foreign companies displayed their willingness to become its residents. The representatives of Nokia, businessmen from China and Singapore confirmed their intention to work in Tomsk.

The strategic directions of innovative activity in the Special Economic Zone for Technical innovation are: technologies for new materials production and nanotechnologies, bio-tech and medical products, IT-technologies, machine-building and electronics. The government support grants preferential tax treatment within the Special Economic Zone for Technical innovation.

There are several Business Innovation Centers (BIC) including Technological Innovation Parks (TIC) in Czech Republic. Among them: BIC C.T.U. Prague, BIC Brno, BIC Plzen, BIC Ostrava, TIC Zlin and Technology center in Opava. All of them establish cooperation with government and research institutions. Zlin Region being in the primary focus of this research is considered in the following chapter.

1.1.3. Zlin Region development, RIS strategy

Innovation became the the most important developing factor for sustainable economic development. The Lisbon strategy sets the economic agenda for the European Union till 2010, and was aimed at closing the gap between Europe and its main global competitors, the US and Japan. In March 2000, the European Council in Lisbon set out a 10-year strategy to make Europe the world's most competitive and dynamic economy**.**

The Region Innovation Strategy concept (RIS), accordingly, has acquired a prominent position within European technology and innovation policy [33]. The concept was expected to implement the Lisbon strategy by increasing Europe's overall competitiveness through knowledge-based regional economy .

The concept of RIS has no commonly accepted definitions but usually is understood as a set of interacting private and public interests, formal institutions and other organizations that function according to organizational and institutional arrangements and relationships conducive to the generation, use and dissemination of knowledge (De Bruijn, Pieter and Lagendijk, 2005) [14].

Within the framework of the so-called Lisbon Strategy, the European Union is seeking to improve individual the potential of individual EU regions for innovation. Every region is offered an opportunity to form its own strategy for the development, i.e. a regional innovation strategy.

The main objective of RIS for Zlin Region was defined in a document "Regional Innovation Strategy" which is to be implemented in the period of 2008-2013. At the same time some empirical studies, as well as recent observations EU-wide, regional performance data underline that the original Lisbon targets are overambitious and do not lead to the regional development as planned, European innovation policies more focus on technological innovation and R&D then on human knowledge capital.

"Education and training should thus, even more than now, be the prime target of development policy. Furthermore, the examination of knowledge regions

across Europe reveals strong differences in specialization patterns in the knowledge economy" (De Bruijn, Pieter and Lagendijk, 2005) [14].

Zlín Region, one of the less developed regions of the Czech Republic, is taking an effort to raise the competitiveness and make entrepreneurship attractive through development of innovation activities. The Zlín Region's proposal for the project "Regional Innovation Strategy in the Zlín Region" has been awarded the grant from the EU budget.The objective of the project is to develop the Regional Innovation Strategy in the Zlín Region and the Action Plan, which increases competition and improves the attraction of doing business in the Zlín region (RIS). Realization of the project is expected to improve conditions for interregional cooperation in the field of innovation within the European Research Area network. On the basis of Zlin Region SWOT-analysis (see Appendix A) made within the Project, strategy for the development was formulated.

The core idea of the strategy in Zlin Region is formulated as follows: Zlín Region will build innovation, R&D and advisory base and relations established between them.

Within the territory of Zlín Region, quality work force will be nurtured in a structure that reacts to market requirements. Innovation activities and cooperation between the research and private sectors will be intentionally supported (RIS document version 30 Nov. 2007) [15].

Based on this model the priority objectives have been defined:

1. Human Resources for Innovation and Competitiveness
2. Support Infrastructure for an Innovative Environment in Zlín Region
3. Support for Innovation of Companies
4.Interregional Cooperation and Public Relations in Innovation of Zlín Region.

Zlín Region, the authority responsible for economic development of its territory, and Tomas Bata University in Zlín, a dynamically developing institution of tertiary education and a base for research and development, along with other partners that support development of the Zlín Region, have concurred on the need

to bring targeted aid to innovative entrepreneurship in the region, and to build a strategy that would boost its regional development.

1.1.4. The Role of a University in the Triple-Helix Model

The Entrepreneurial university is a new type of institution which is evolving as a result of the intensive interaction between the previously isolated spheres of the university, industry and government. The university is being molded into an entrepreneurial entity characterized by 'the third mission' of direct contributions to the national economy (Etzkowitz & Leydesdorff, 2000) [16].

The entrepreneurial university, thus, 'integrates economic development into the university as an academic function along with teaching and research (Etzkowitz, 2003) [2].

The issue of the role of universities in regional development has been traditionally concerned with two issues: the economic effect of direct employment of staff and student spending in the local economy, and technologytransfer, particularly through the creation of spin-off companies and the establishment of science parks [28]. Currently the role of universities in regional development is considered as going beyond this narrow technical and economic approach to understand the role of universities as more integrated. In this kind of university, the foundation of spin-off firms has become systematized into an organizationally refined approach that makes the entire institution 'a quasiincubator' fostering new business ventures, helping start-up companies and encouraging the growth of regional trade and industry (Etzkowitz, 2002) [1].

Marginson S. and Considine M. identify eight different functions of modern universities that may potentially lead to economic development: creation of knowledge, transfer of existing know-how, Human-capital creation, Technological innovation, Regional leadership, Capital investment, Knowledge infrastructure production, Influence on regional milieu. Each of the items in this list being a distinct university output, they are not mutually exclusive in terms of university activities - particular activities may overlap among the identified functions. Each

of the items may cause a distinct pattern of impact on the regional economy, varying from the direct and indirect effects of university spending to productivity gains in private enterprises, from the creation of new firms to increases in regional creativity and the capacity to sustain long-term development and growth (Marginson and Considine, 2002) [17].

1.2. Classification of University Models

The search for new educational forms able to meet the demand of labour market has led to the rise of new types of higher education institutions:

- An academic research university
- A regional university
- An entrepreneurial university
- A virtual university (E-Learning distance education) and some others.

The variety of university models do not exclude any of the basic systemic functions of a university, they rather tend to enhance and establish as a priority one of their directions that later would become a main board activity for the institution.

The models offered are out of conflict with a university mission, and certain elements of the models observed are synonymous [34].

The present research has analyzed the definitions most commonly used to describe the university models and their transformation trends. Theoretically analyzed and most popular key university models are currently considered to be the following [34]:

- An academic research university
- A regional university
- An entrepreneurial university

1.2.1. An Academic Research University

Academic research universities are involved in fundamental and applied studies, often not liable to further commercialization due to national strategic

interests, and train highly qualified research and academic staff (doctorate studies, post-graduate studies in a wide range of research fields) [35].

The beginning of 1970-s saw "Classification of the USA Higher Education Institutions" developed by the US Carnegie Foundation committee, the named classification still remaining a guiding document for the research universities in Canada and UK) [36].

The classification puts into an academic research university category the universities offering a wide range of bachelor's programs, training elite research staff for a PhD and putting much effort into academic research, receiving the annual funds in the range of $15.5- 40 million as a Federal support, and conferring at least 50 PhDs per year.

Carnegie Academic Research University Criteria [36]:

1. Availability of a PhD program, taking into account the number of disciplines in which the university has the right to confer a PhD (the main criterion).
2. The amount of Federal research and educational grant funds awarded (the main criterion)
3. Availability of a bachelor's program.
4. The rating in the list of leading universities for the amount of Federal financial support for academic research.

1.2.2. A Regional University

Regional universities develop along the line of prevalent regional interests, setting the pace of social and economic advancement in their region (playing a determinant role). Above their common (routine) function of educating the community, these universities offer an expensive research-based reproduction of scientific and academic labor resources vital for the region. A university academic community focused at getting and accumulating the fundamental research results serves as the basis to shape its regional identity and advancement.

The present day more or less successful university presents in itself a structure that has rooted itself into its regional economy with all of the three most important components: offering customized staff training, running applied research, unfolding innovative technologies on demand.

In fact, the tendency to adjust all the resources available in the region to its needs is clearly visible in the modern regional university model. This approach is quite correct under the conditions of scarce resources, but that same model can be inefficient and fund consuming under sustainable economy. A regional university has to be much more than an educational facility, it covers quite a large range of other areas, like regional academic science, industrial production, peer review, etc. This type of university can only come into existence when its mission has been developed as built-in within the system of its regional economy[37].

The Entrepreneurial model of a university stays apart in the classification and will be given more detailed consideration for the purpose of the present research.

1.2.3. A University as Entrepreneurial Organisation

Theory of entrepreneurship gives enough basic tools to apply its concept to the universities activity. Entrepreneurship constitutes three essential elements: organizational activity, initiating changes, material profit, both as a target and as criteria of success.

Entrepreneurial activity is characterized by a special rationality connected with the working under the conditions with initially incomplete knowledge and active exploration of new information, closely intertwined with intuition. Innovative character of entrepreneurship is highlighted in the works of Henry Etzkowitz.

The emphasize on innovation as a major criteria of entrepreneurship can be also found in M. Weber (being targeted to innovation separates an entrepreneur from philistine - the average man, from a bureaucrat, according to the author) [18]. Innovative activity of a manager is connected with a search, activation,

development, and rational use of recourses, essential for an organization. Innovation Additional criteria of entrepreneurial activity are “financial, psychological and social risks, the ability to relocate the financial recourses from an area of low effectiveness and profitability in to the area of higher profitability and effectiveness and taking actions in the conditions of limited information resources [19]. The type of interconnections within its organization and the mode of managing all its activities suit the main features of an entrepreneurial entity: sustainability and independence, financial commitment, financial risks and responsibilities.

An entrepreneurial university is able to make headway under risky circumstances, in dynamically changing internal and external environment, and retain its economic efficiency, if it is fostering the economic and social development of its region. The primary resource of an entrepreneurial corporation is its human capital: professors, staff workers and students, their competences, entrepreneurial and leadership skills.

To summarize, an entrepreneurial university can be defined from several perspectives:

The perspective of “a produce” – an organization whose main goal is to produce high-tech innovation technologies and to commercialize them.

The perspective of interacting with external environment: an organization forced to operate in the market conditions of risk and dynamic demand.

The perspective of interaction with business structures – a basis organization serving to develop and put into operation commercial firms.

The perspective of management structure – an organization whose top-management’s mission is to define income generating development strategies, and whose staff’ work is based upon the balance of risk and profit.

The comparative analysis of an Entrepreneurial Universities established in the USA, European Union and Russia followed by theoretical summary of research results is presented it the table 1.

Table 1. Comparative analysis of University Models

Criteria	Research University	Regional University	Entrepreneurial University
Financial base	Government budget, extra budgetary funds 50%	Guaranteed Government budget	Independence from the government funding, extra budgetary funds; pursuit of self-financing
Research	Fundamental and applied studies, often not liable to further commercialization due to national strategic interests	The fundamental research results serves as the basis to shape its regional identity and advancement	Applied research with commercialization being as an essential requirement
Management structure	Linear functional	Linear functional	Self-learning flexible-structure organization
Region relations	Cooperation with Research institutes	Cooperation with local government and industry	Cooperation with business and industry
Education sphere	Training of highly qualified research and academic staff	Research-based reproduction of scientific and academic labor resources vital for the region	Training highly qualified specialists by custom orders of local business community
Corporate Culture	Long–term Goal oriented unity	Different types of culture, compromise oriented	Entrepreneurial corporate culture

1.3. The Genesis and Definition of the Entrepreneurial University Model

Counteraction between a modern university, government and business was described by several authors in USA and Europe.

Since the mid 1990s, many scientists have proved that science and universities are undergoing transformations. Changing global economy made university become an institution losing their traditional characteristics as they become involved into the global knowledge economy and related national innovation policies (Etzkowitz, 2003 [20]; Halliday John, 2005 [21]; Lee, J. L. and R. A. Rhoads, 2006 [22], Boyne, G. A. 2002 [23]). Universities in that way choose the entrepreneurial way of functioning to sustain in new conditions of global economy. As elaborated in the literature, the rise of the entrepreneurial university may be caused by a variety of different reasons. For instance, the concept has been used to represent the application of market-like mechanisms in university management, to account for more intensive participation of academics in technology transfer (Slaughter and Leslie, 1999) [24].

Next, the concept and the term "entrepreneurial university" was first defined in the B.Clark's book "Creation of enterprise universities: organizational ways of transformation", which has served as a major contribution for the development of modern university management[25]. By B. Clark's definition, an entrepreneurial university is an institution actively looking for the ways to reduce its dependence from the state. These universities put their goals of educating, research and developments on equal terms with the results of these activities.

Based on his research in to the ways of five western European universities following their transformation the author formulated his first generalized concept of a modern university. This concept proved its theoretical and application value through a novel dimension in the academic community – the possibility of academic entrepreneurship in every existing area of activity in higher educational institutions. Clark identifies five elements of behaviour in his intensive case studies of some successfully entrepreneurial universities of the '90s. He notes that the

successful examples have all 'expanded the developmental periphery', which involves joint ventures, spin-off companies, large contract research centres with industry links and so forth and have also 'diversified the funding base' by seeking deals with government funders, philanthropic foundations, independently generated revenues from students services and other sources (Clark, 1998) [26]. In relation to the diversified funding base, Clark states that a university seeking to become entrepreneurial must move from sole dependence on government block grants, and whilst seeking to increase its share of government research funds that are competitively won, must nonetheless work extremely hard to develop the 'third stream' of funds in particular (Clark, 2003) [25]. The second of Clark's elements is that of ***strengthening the steering core***. Here, he sees that universities must be pro-actively, intentionally and willfully entrepreneurial, rather than passively waiting for it to happen or simply hoping it will. This requires a strong administrative backbone that runs from the top of the university, through faculties and ultimately to departments, institutes or academic units below that. A reasonably clear managerial chain of command that is able to plan strategy, make decisions and implement with some clarity and authority is the essence of that backbone (Clark, 2003) [25]. Clark's third element of ***expanding the developmental periphery*** of the university suggests that an expanded developmental periphery is therefore likely to have a number of partnerships with business and industry at any given time. It is likely to result in many non-traditional units that cross old boundaries. It is also likely to have some part owned interests in ventures or projects (Clark, 2004) [30], to be actively seeking outside connections and networks to aid development, and it is likely to be highly engaged with its community at various levels. Fourthly, Clark's element of ***stimulated academic heartland*** Clark states that keeping academic departments and units vibrant, dynamic and motivated is vital. He notes that management must take care to involve the 'academic heartland' in participative ways whenever possible, and that those who are best positioned to generate revenues for their university, must be strongly encouraged and 'incentivised' to do that, for the benefit of all in their institution (Clark, 2004) [30].

The fifth element of Clark's framework is that of creating ***an integrated entrepreneurial culture***. He states that "to eventually create its own perpetual momentum or dynamism which is what must happen to succeed as an entrepreneurial university. Ideas, beliefs, attitudes and values are all part of the entrepreneurial culture, and all staff must ultimately be aligned to a high degree on these aspects for good entrepreneurial results (Clark, 2004) [30].

The model of five elements developed by B Clark is presented on the figure 2.

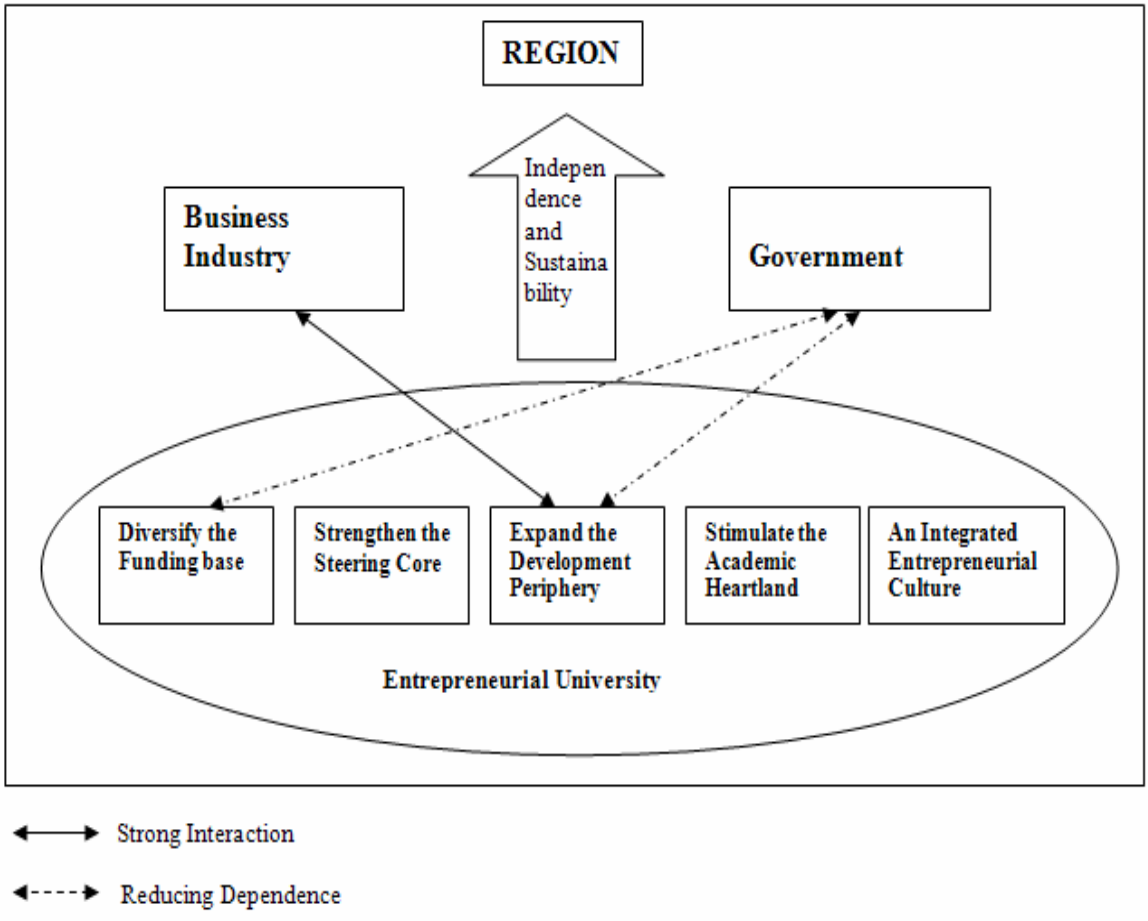

Figure 2. Entrepreneurial Elements of University by B. Clark

As analyzed by the author of the research the model of Clark does not give brief descriptions how five elements should be transformed and what initial steps should follow to transform university in to entrepreneurial organization. Also the model of Clark assumes independence from state and does not targeted to region development. Its primary goal to sustain during the period of transformation, and

become sustainable entrepreneurial organization on the market [30]. However, Clark's work established a concept of the entrepreneurial university, and outlined some dimensions or elements involved in bringing it about. These five elements and foundings of H. Etzcowitz became the ispirations for the author to go further and to sythetize original Trasformation model into Regional Entreprenerial University. Others in higher education have also added some ideas on how the university might be made more entrepreneurial in day-to day practice, most building on Clark's framework. For example, institutions such as Twente University (Netherlands), Warwick (UK), Arkansas University, Johns Hopkins University (US), University of Strathclyde (Scotland), Chalmers University of Technology (Sweden) и University of Joensuu (Finland) and Tomsk Polytechnic University, Tomsk radioelectronic university, Nigniy-novgorod University (Russia), are described as transformed places, universities that have amply confirmed Clark's concept of expanded periphery.

Next, five norms of academic entrepreneurship were formulated by Henry Etzkovitz. As eloborated from his studies, The entrepreneurial university model can be expressed in a set of inter-related propositions: Capitalisation, Interdependence, Independence, Hybridisation and Reflexivity. hese principles have been derived from the analysis of entrepreneurial academic development in the USA, Europe and Latin America and may be utilised as guidelines for institutional renovation [31].

H.Etzkovitz considers that five norms as following:

Capitalisation: Knowledge is created and transmitted for use as well as for disciplinary advance; thecapitalisation of knowledge becomes the basis for economic and social development and, thus, of an enhanced role for the university in society.

Interdependence: The entrepreneurial university interacts closely with the industry and government; it is not an ivory tower university isolated from society.

Independence: The entrepreneurial university is a relatively independent institution; it is not a dependent creature of another institutional sphere.

Hybridisation: The resolution of the tensions between the principles of interdependence and independence are an impetus to the creation of hybrid organisational formats to realise both objectives simultaneously.

Reflexivity: There is a continuing renovation of the internal structure of the university as its relation to industry and government changes, and of industry and government as their relationship to the university is revised [31].

He describes three stages and phases to the development of the university as entrepreneurial organization. The first one, he calls initial phase – the academic institution sets a strategic view of the direction to become entrepreneurial and "gains some ability to set its own priorities, typically through negotiations with resource providers" [31] In the second phase – the academic institution takes "an active role in commercialising the intellectual property arising from the activities of its faculty, staff and students"[31]. And in the third phase the academic institution takes "a proactive role in improving the efficacy of its regional innovation environment, often in collaboration with industry and government actors".[31]

1.4. Conclusions from Chapter 1.

The first chapter is aimed at formulating of the tasks of the research. Resolving of the tasks being formulated allows to answer the Questions of the research and to provide the scientific basis for the model creation:

Q1: Is it necessary to implement the Educational – Bussiness – Government Triple-Helix Model for the development of an Innovative Region?

Q2: Could Entrepreneurship become the right resource for the development of Universities for participation in Triple-Helix?

In the present chapter, author has provided the analysis of the literature sources dedicated on systems of innovation and conceptual role of a university as a core for region development. The Triple-Helix is considered to be the most dynamically evolving and responding model for knowledge based economy. The Triple Helix model proposes that the interaction in „University – Industry – Government" is the key basis of innovation in a knowledge-based economy. It

considers University as a promoter of innovation and knowledge. As analyzed by the author, there are several world successful examples of innovative regions or regions starting to implement Triple-Helix model confirm its effectiveness and show us some directions to follow.

Zlín Region, one of the less developed regions of the Czech Republic, but it is already taking an effort to implement Triple Helix model, and to develop entrepreneurial innovative activities by its main instrument – Regional University (Tomas Bata University). Implementation of RIS in Zlin Region may help to achieve primary goals: providing a well-functioning infrastructure and increasing the quality of life of population in the region.

The performed by author comparative analysis of the existing university models shown that the model most relevant to nowadays financial, political and scientific realities is the Triple-Helix model. Academic research universities are involved in fundamental and applied studies, often not liable to further commercialization due to national strategic interests. Regional universities develop along the line of prevalent regional interests, setting the pace of social and economic advancement in their region. The Entrepreneurial university is a new type of institution which is evolving as a result of the intensive interaction between the previously isolated spheres of the university, industry and government.

However, it is found, that the conceptual Triple-Helix model suggested by Clark is not enough explanative of how the elements of the model should be transformed and what initial steps should be done to transform a university to the entrepreneurial university.

The next chapter is aimed at the creation of the RegionalEntreperneurial University Trasformation Model, and also further model customization according to specificity of the Zlin region and Tomas Bata University.

2. CHAPTER 2. THE DEVELOPMENT OF REGIONAL ENTREPRENEURIAL UNIVERSITY MODEL

2.1. Criteria and Features of Regional Entrepreneurial University

The mission of a regional entrepreneurial university is to build up and sustain the intellectual potential and promote the steady economic, social and cultural growth of the region.

By its definition "a criterion" is a feature, a standard by which something may be assessed, defined or classified [39]. Considering its innovative nature, the criteria for an entrepreneurial university should represent a unified system built upon the two main features:

- **Entrepreneurial activity;**
- **Innovation in education.**

As elaborated from the research in the previous chapters, an entrepreneurial activity within an educational structure – it refers to an innovative activity of an educational institution aimed at developing an educational potential in a community to adapt to the acting market economy laws.

Innovation in education – it refers to a mechanism enabling a university to influence the advancement of education, science, economic and social progress starting from an idea and ending at the implementation stage [37].

The features to recognize an entrepreneurial university are: training highly qualified specialists, who are adapted to work in the market and meet the demands of the region and its business structures; targeting towards research commercialization as ordered by real sector economy; diversified extrabudgetary funds; pursuit of self-financing; shaping its organization into a self-learning flexible structure; established entrepreneurial corporate culture; subservience to community through close collaboration with all interested regional entities.

Each of the criteria mentioned takes into consideration the goals to be achieved by the university, and is therefore characterized by a set of controls to

check the research process and the dynamics of a certain activity. Each of the activities is provided with the system of indicators to assess its effectiveness.

The whole range of the indicators may include hundreds of specific indices.

The criteria to define a university as an entrepreneurial type of institution are selected by the principles helping to determine the direction of its transformation:

- University management system criteria adjusted to the basic features of modern markets and their functioning laws;
- The criteria to determine the degree of the university entrepreneurial culture integration into its overall activities, to show the degree of staff involvement into the process of goal setting, selecting optimal means to achieve the goals, (fostering academic values and their continuity, promoting leadership, risk taking, dynamic advancement and entrepreneurship);
    - The criteria of economic sustainability to determine the stability of the university's financial status (are defined by financial balance, cost minimization, provisions for future development);
    - The criteria of the enrolement into relations with other organizations in a Region.

  The overall university management effectiveness can be determined by a set of indices:
    - On a short term basis – by performance, internal cost-effectiveness and satisfaction parameters;
    - In the interim - by adaptability and advancement of the institution, is performed based on sociology studies and questionnaire surveys;
    - in the long-term- by survival.

The present study dedicated to the experience of establishing and advancing foreign universities in the form of innovative structures enabled to describe a unified conceptual system of traditional universities' transformation activities in their response to new external challenges – an entrepreneurial university.

Present research has studied the recent conceptual university models to come to the conclusion that their differences are based on the enhanced development of one of the directions that should become the basic activity of the university, without any signs of denial to any of the systematic university functions. But after all, the role of university and its activity should lie in the development of its region, human capital and therefore, establish good interaction with local organizations. The chosen regional entrepreneurial university model is designed to maintain and develop the intellectual potential of its region and to promote the sustainability of economic and social and cultural growth.

The research allowed to develop a transformational model to shape a university into a regional entrepreneurial university as they function within the Triple Helix Model.

A university transformation plan is based on the main principles that determine its reshaping into an entrepreneurial university.

The distinctive feature of the transformation plan is the module- type interaction of all the primary components:

- Organizational structure adequate to new goals and management/ autonomy methods**:** Introducing a flexible organization structure, management and self-government techniques; Transfer to strategy management to enable flexibility in response to external challenges and to introduce timely changes serving to achieve competitive advantages.
- Perfecting educational Activities**:** Enhancing innovative education on high level demanded on the labor market;
- Perfecting (upgrading) scientific effort: integrating research, education and innovation activities of a university to produce novel "university products" and to improve the previous ones;
- Forming a multi-channel financing base: an active search for new and broadening the existing financial channels;
- Building university corporate culture and internal competitive environment.

The core idea of the Trasfornation university model offered in this research (see Figure 3), (see Table 2) is to introduce a flexible comprehensive mechanism that would allow a university, while retaining its traditional academic values, to become a leading unit within the Triple Helix model and to promote its regional knowledge-based economic advancement.

2.2. Transformation into Entrepreneurial University to incorporate Triple-Helix Model

The present study dedicated to the experience of establishing and advancing foreign universities in the form of innovative structures enabled to describe a unified conceptual system of traditional universities' transformation activities in their response to new external challenges – an entrepreneurial university of an innovative type.

On the analysis of univeristies followed the model of entrepreneurship made in the research to be able to keep the academic traditions, academic foundation of a university and to stimulate its research and innovative activities, to provide the conditions required to integrate its scientific, educational and innovation activity within Triple-Helix model, the author developed a trasformation model for an Entreprenerial university to be able to function successfuly based on five university elements introducing entreprenerial components.

This model was developed and synthesised from the available literature as discussed in the theoretical part of the research. It purposefully set out to combine two sets of literature. The model was developed by analysis and synthesis of infomation about Regional development, Triple-Helix model, the working elements of entrepreneurial universities, most particularly, the framework of Clark, Etzkowitz, but mostly the aouthor attepted to implement and to use some instruments of corporate management in application to univeristies. The resulting draft model, that attempted to identify a composite picture of key Entrepreneurial University elements and Triple Helix model, emerged as Figure 3. The detailed description of the model gived in the Table 2 was sythetised on the great analisis of

different literature on University practises and from the privete expirience of the author.

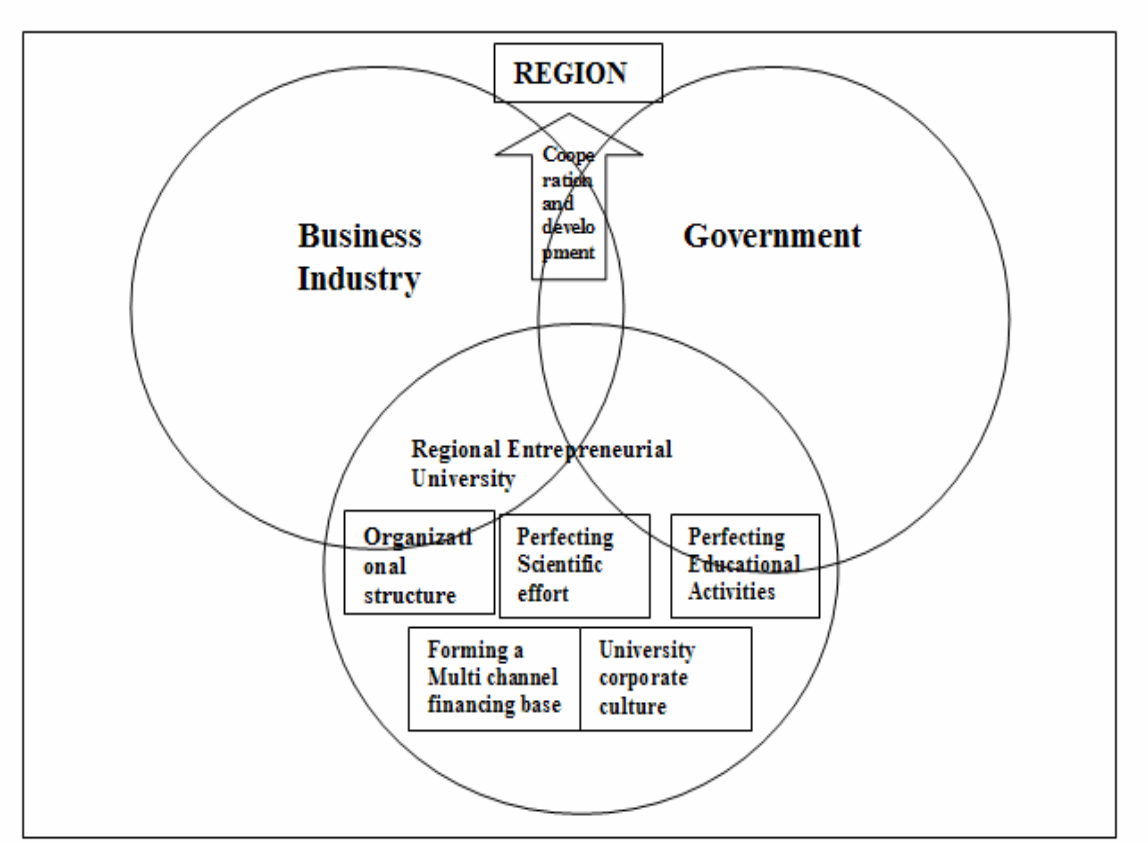

Figure 3. Regional Entrepreneurial University in Triple-Helix Model

The description of the Figure 3 is presented in the Table 2.

Table 2. Transformation into Entrepreneurial University to incorporate Triple-Helix Model

An organizational structure adequate to new goals and management/ autonomy methods	• A clear and accurate formulation of a university mission, shared by the majority of administration and staff workers willing to implement it • Enhanced efficiency of strategy planning, management and implementation of university development programs; • Unified tactics of university management and strategy goals and directions ; • An organizational structure adjusted to solve strategic problems via more adequate interaction with external environment, as well as tactical goals within the university. • Developing marketing research in the main areas of university work • Activating continual self-examination, self-appraisal and self-

	attestation process in a university • Improvement professional qualifications of university managers
Building university corporate culture and internal competitive environment	• Creating a competitive type of culture supported by a certain hierarchical type of culture. • Innovative type of culture at the faculty and department levels. • Developing a new system of university management. It should become an interface between the two types of cultures allowing to use the strong sides of each culture in full and to smooth out their contradictions. • The core of the new management system is in establishing a multi-level management, eliminating a rigid link between the scientific, educational and managerial career tracks in the university, leveling the motivation in all of them. •
Forming a multi-channel financing base	• Higher volumes and better quality of research development • Creating and implementing innovation technology products (pilot and small-batch production) • Introducing new educational services and innovative educational technologies. • Running large-scale projects, including international ones. • Broader range of consulting services; • Leasing vacant space of a university; • Donations from sponsors and patrons; • Donations of university graduates. • Developing an infrastructure to interact with relevant external domestic and foreign environment • Active involvement of Graduates Association and its branches into university work. • Broadened interaction and joint structures with other schools. • Engagement of existing small high-tech companies to implement innovation developments of a university and to establish new companies (business incubators). • Development of cooperation with large domestic producers and transnational companies. • Expanding of cooperation with pre-university educational institutions, establishment of educational systems, cooperation with local and foreign universities and research institutions, creation of productive transnational structures, expanding the network of university branches and representative offices in

	the country and abroad. • Active interaction with a variety of local and foreign associations, funds and community organizations. • Efficient continual work with ministries and departments, building relations with legislative and executive authorities at every level.
Perfecting (upgrading) scientific effort	• participation in cooperative international scientific research programs, to perfect the operation of its international laboratories, educational, scientific and innovative centers; • creating a system for continuous generation of competitive ideas, efficient selection of innovative developments, and to enhance their competitiveness in commercialization of intellectual property; • development a system to provide for the efficient commercialization of the developments via establishing and incubating small and average size innovation firms; • creating a technology park supporting a systemic development of infrastructure for high-tech business (incorporates operating companies, branches, laboratories, business incubators, training centers); • development a student business incubator serving as a basis to develop entrepreneurial skills among students and train elite specialists at the technology park; • Establishment an institute of scientific mastership and entrepreneurship. •
Perfecting educational Activities	• A system to monitor local and foreign markets of educational services. • Training by new educational programs highly demanded at the labor market. • Curriculums developed in cooperation with leading foreign schools. • Developing a practical personnel training system to meet the labor market requirements. • Establishing cooperation with industrial enterprises and scientific bodies, academic institutes. • Creating joint structures (branches of departments and laboratories, educational and research centers) with industrial companies and scientific institutions. • Development of agreed curriculums for educational, field and pre-graduation practice, probation period to facilitate realistic practical training for students.

	• Expanding the geography of student field practices. • Integration of university and other research and production units in the educational process. • Teaching of team work methods in groups including future researchers, developers, economists, lawyers and managers. • Motivation of all the participants of the process: students, professors, research institutions and employees. • Establishment the system to aid the employment of graduates and to follow trough their career. • Introduction of the system of independent quality assessment for specialists' professional training. • Development of the system of additional professional education at the university. • A system to monitor the needs of leading companies for training and retraining their personnel. • Establishment of a system to further train university staff. • Development of a system of distance education. • Developing library resources and services of information support for the educational process to meet the standards of leading world schools. •

The grounding each of the blocks presented in Table 2 described below.

2.2.1. An Organizational Structure Adequate to new goals and Management/ Autonomy Methods

By the analysis of several university models existing in the world, made by the author in the research, a University corporate management consists of two main components:

- **Strategic management** (evaluation of future development prospects and arrangement of conditions to achieve the long-term goals) [39],
- **Quality management** (an instrument to implement a university strategy that provides for higher quality of its basic products).

Transition to strategic management should become the primary stage in a university transformation.

The strategy is to be formed based on the mission and goals, environment analysis, a university potential, the demand for the university's services and

products, and other factors [42]. Thus, the central role in the professional entrepreneurial organization management belongs to its innovative mission that sets overall standards of university functioning. The mission defines the university functions, shapes its priority types and forms of activity, while maintaining the condition that the university will remain a university. In the present research the author refers to some examples of university missions: «Our goal for The Stanford Challenge is nothing short of building a university for the 21st century and beyond: A university that will better serve the world through the quality, impact, and vision of its research, and through the new generation of leaders it will produce. Embracing this bold agenda will require strong leadership from our faculty and the moral and financial support of our alumni, parents, and friends" [43].

“The mission of TPU is to advance knowledge and experience, allowing any individual, society, and Russia as a whole to assess and introduce the best methods of training for the highly qualified specialists and to bring about innovations in the sphere of science and university education” [44].

The major strategies of the Tomsk Polytechnic University are as follows:

- Development of fundamental and applied research;
- Formation and development of research and educational institutions;
- Collaboration with the leading scientific, educational, and industrial centres;
- Motivation of students, teachers, and other employees to integrate traditional academic values and entrepreneurial ideas;
- Harmonious development of an individual and training of specialists capable of leadership and effective teamwork, ready to succeed in the conditions of today's competitive environment;
- Providing life-long training and showing the pathway to a successful business career [44].

At a university level, Quality management may expediently employ the Total Quality Management concept based on the two notions: an external consumer – the individuals for whom the created product is intended, and an internal consumer –

the individuals whose knowledge, skills, talents and paid labor create the product of specified quality.

By A. Deming The Total Quality Management theory is based on “three pragmatic axioms” [45].

These axioms and principles can be appropriately applied to a university as an organization yielding research products and offering educational services.

The first axiom is “Any type of activity may be viewed as a technological process and thus can be improved”. The second axiom: “Production should be regarded as a system. That is why solving some partial specific problems is not nearly enough (sufficient). It requires systemic fundamental changes.” The third axiom: “In every situation top management of an enterprise should take actions to hold responsibility for the company’s activity” [45].

The next stage of university transformation should become restructuring its management.

An innovative university structures should meet a number of specific requirements [42]:

- To organize an integrated scientific, educational and innovative activity aimed to provide most favorable conditions that promote creativeness, build-up research and educational teams to efficiently interact with its environment.
- To sustain a complete life cycle of activities for the primary university functions- education, research and innovations.
- To provide for interaction and cooperation between specialized university departments responsible for its educational and innovation activities.
- Open and flexible innovative university structure based on self-organization principle, which ensures its further development and forms the ability to adjust to new conditions.
- To make provision for interaction of innovative university with relevant environment: primary domestic and foreign profile markets, industry,

research institutions, business community, federal authorities and power structures.

- To secure multi-channel funding;
- To provide information analysis services to university administrative body,
- To apply strategy planning for innovative university development.
- University graduates follow-up - to offer lifelong education to graduates and help maintain their competences at a socially significant level.
- Legal protection of university intellectual property right.
- Forming an innovative university infrastructure.
- Supporting main profile marketing research .
- Making provision for on-going (continuous) introspection, self-appraisal, self-rating and self-assessment processes in a university.
- To ensure stronger participation of public institutional settings in university management, while maintaining a powerful administrative core.

Today, a matrix management structure is a most definitive model to meet the market conditions. Matrix management is a type of organizational management in which people with similar skills are pooled for work assignments [50]. The Matrix management structure lead to the development of project management concepts. A project is a complex goal-oriented job aimed to solve a specific task within a preset time frames. A project team is responsible for the product from its development to implementation (sales) stage. Project management empowers with its methods and tools of time management, financial management , helps to solve the issues of recruiting a competent team and analyze the potential project risks.

Changes in organizational structure should lead to university staff and students involvement in university management, which assumes participation in shaping its strategy directions. Moreover, it also assumes involvement of wider community, employers, graduates, which will help to create the system of immediate response to changes in external environment.

The figure of Organizational structure presented in Appendix B, shows a model organizational structure of a university management core. The organizational structure incorporates departments responsible to accomplish the university entrepreneurial strategy and closely cooperate with other regional structures to ensure that the university functioning meets the above stated requirements.

2.2.2. Building University Corporate Culture and Internal Competitive Environment

Implementation of the strategy plan assumes creating corporate culture that is to be understood as:

- it is what an organization has: its system of behaviors, symbols, rituals;
- it is what an organization is: its mission and the method it applies to fulfill its mission, both internally and externally.

The four-element (four-factor) model of corporate culture system description (definition) unites the four organizational structure types:

1.Hierarchial culture, 2. Competition (market) culture, 3. Adhocracy (creativeness) culture and 4. Family culture [37].

There are qualitative and quantative methods to measure corporate organizational culture. One of the useful methods is Organizational Culture Assessment Instrument (OCAI) [42]. The Organizational Culture Assessment Instrument (OCAI) is based upon the Competing Values Framework [50].

An average count of around 40 dimensions return regularly in management literature, essays and courses about organizational culture. For example: strength, congruence, strong, weak, speed of feedback, degree of risk-taking, people orientation, response to the environment, clarity, direction, conflict resolution, performance emphasis, and human resources.

All these phrases are divided in 4 quadrants by:

- Horizontally: left: internal focus and integration to right: external focus and differentiation.

• Vertically: top: flexibility and discretion to bottom: stability and control (see Fig. 4, Corporate culture of Michigan University - OCAI method [37]).

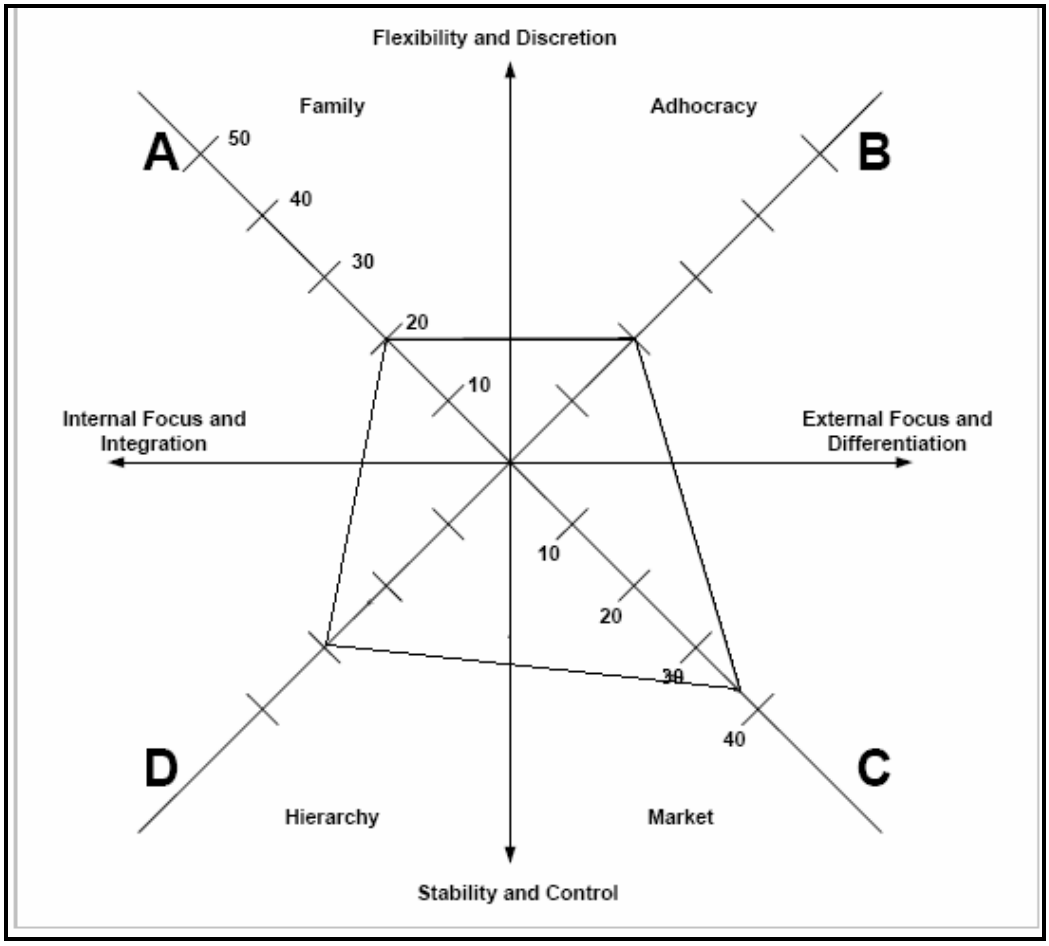

Figure 4. Corporate culture of Michigan University (OCAI method)

This framework is called the Competing Values Framework and is used as a basis for many methods and theories, For example the Competing Values of Total Quality Management. On the picture the corporate culture of Michigan University (Ann Arbor, USA) is presented. The Michigan University works under market conditions since its establishment in 1918, being one of the most successful public universities. The research of Michigan university organizational corporate culture was taken in 2004-2005 using OCAI method and interviewing [37].

As the result from the research made in Michigan University was determined that organizational culture is non-uniformly distributed. There are Subcultures of type "Hierarchy" and "Market" prevailing. It means that organizational parameters

like- leadership, the motivation system, criteria of success, decision-making - practically coincide with each other. It means that organizational culture of this university is strong and adequate for successful functioning.

There is a strong nesesity for corporate culture to be in agreement with strategy of organization. Conflict between goals, strategy and mission is not desired, as far as it does not allow for stuff to persept new strategy adequately and to work sufficient on its implementation.

There is mechanism to harmonize corporate culture with new goals (See on Fig) presented by the author:

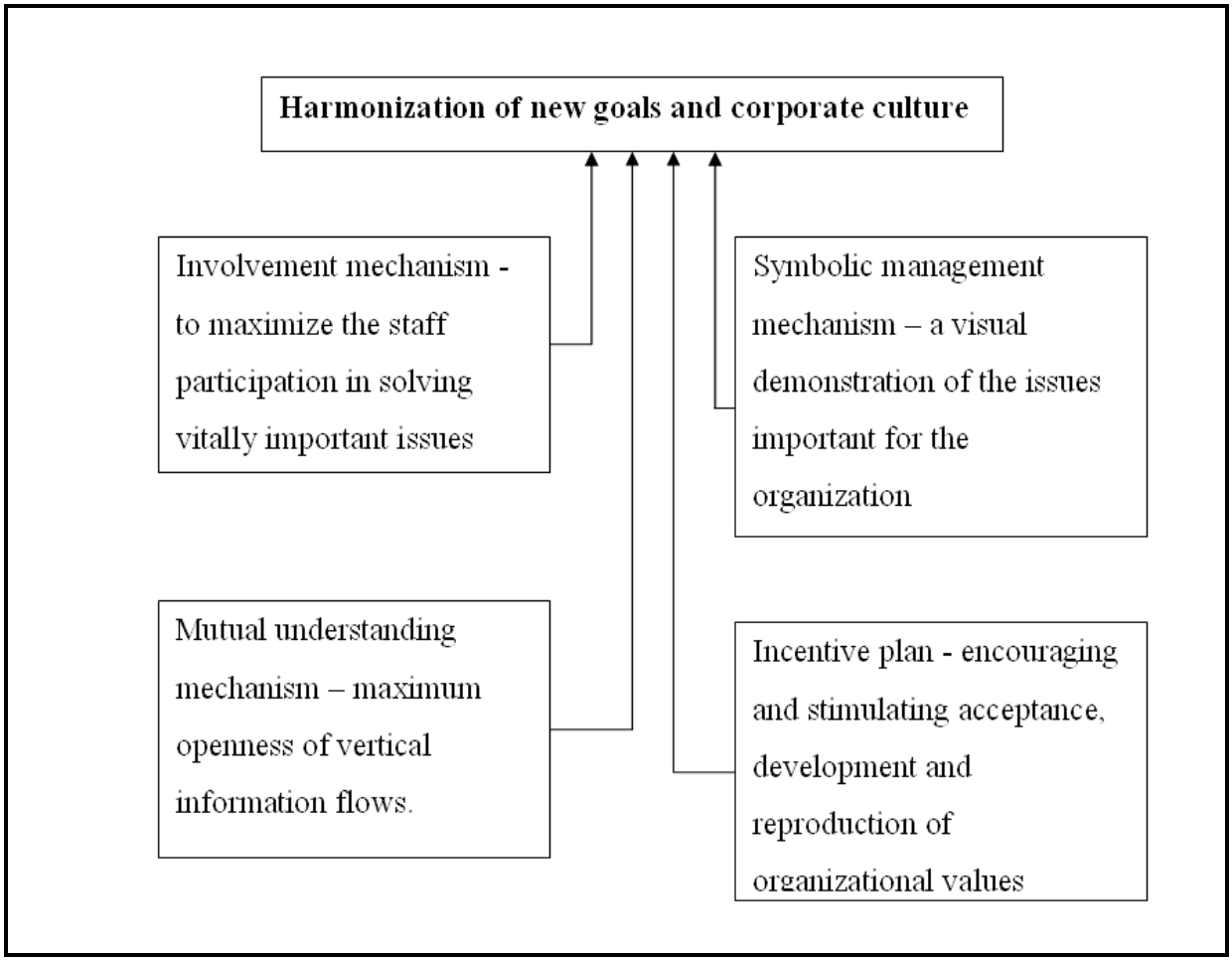

Figure 5. Harmonization of New Goals and Corporate Culture

2.2.3. Forming a multi-channel financing base

In this block the author refers to one of the most interesting and recent methods to attract financial resources into a university budget - fund- raising.

In the course of the present research the author has come to the conclusion that the present method is no less efficient than getting profit through research–and–development activity. Moreover, the method helps to stimulate innovation and entrepreneurial activity in a university.

Fund-raising is a strategically planned process utilizing market principles, and involves the acquisition of financial resources and tangible assets, as well as know-how and time with the goal to serve the society [46].

Fund-raising basic principles [46]:

- Utilizes the basic marketing principles
- In-depth study of (Closely investigates) external and internal conditions for fund-raising
- Requires the skills to assess and analyze each particular case
- Availability of a strong fund-raising team
- Identification and analysis of every potential sponsor
- Established Budget system and budgetary control at the university
- Fund-raising program and strategy optimization (Optimization of fund-raising programs and strategies)
- Clear (precise) fund-raising campaign planning
- Respect for donors' interests (wish), designated use of funds and transparent system of reporting and accountability.
- Repeated recourse to donors(sponsors)
- Regard for peculiar national culture in fund-raising strategy making.

The are several interesting examples of implementing and using methods of Fund –raising by Universities analised by the author of the research following below.

The first one is Istanbul University experience in fund-raising (ITU Foundation and ITU Development Foundation) [47].

They consider „Fund-raising" as the job of organizations specially established for the purpose.

The revenue portion is built through providing educational services, research and consulting activities to third parties, alumni sponsorship. The resources secured through a fund-raising campaign by the above mentioned organizations were spent in three stages:

At the first stage they put up the money for the projects directly related to student education and living conditions .

The second stage funded the infrastructure related to research and development activities.

The third stage continued to finance the objects of the first two stages, but at a qualitatively new and higher level with the goal to earn revenue.

The second interesting one is Amsterdam University(Holland) experience [46].

The Amsterdam University started to introduce its fund-raising system with the creation and build-out of alumni network that was intended to be used, along with other components, for academic fund-raising. The project of creating the alumni network was pursued during five years. University financial management was collected by several steps.

In the first place, the university compiled an excellent database of its former graduates and friends. Secondly, the alumni policy was focused to make the graduates feel that they are part of the academic community. Thirdly, an independent graduates' organization that has its own management committee was established. And finally, appropriate candidates to work in alumni office were recruited (with the skills of administrative work, special training in fund-raising and the personal qualities of persistence, sociability and friendliness).

Based on the experience of American colleagues and taking into account its external and internal specifics, the University of Bremen developed its own fund-raising strategy [46] :

The university declared fund-raising to be one of its primary tasks, and its rector – as a leader of the fund-raising campaign. The long-term goals were

defined and the university mission was formulated. Selection criteria were established for the projects to be funded by donors.

The fund-raising was conceptualized with due account for the university long-term goals.

A course on fundamental fund-raising principles and the specifics of the Bremen university fund-raising conceptn was developed to train the deans and administrative staff of the university.

In every speech at the university premises and outside the rector would mention that the university is aimed at securing a new source of income through fund-raising, the secured resources to be used for further university development in whole [46].

2.2.4. Upgrading Scientific Effort

As a preliminary, we shall define the two primary concepts of innovative activity:

The process of innovation - is creating a new or an improved product or technique, turning the results of intellectual activity into a marketable (salable) off-the-shelf product, and the activity related to adoption and application of the innovation by producers and consumers [49].

Commercialization process – is implementing the results of intellectual activity directed towards acquisition of income (profit-oriented).

Primary elements of innovative system existing in business to be also utilized in university innovative activity [46]:

- Infrastructure elements that provide for the steps down the innovation chain from an idea to serial production.
- Elements effecting the innovation techniques and products promotion to the market – consulting agencies, exhibition and information centers, certification bodies.
- Funding sources to provide for the innovation chain advancement.
- Sources of Personnel for innovative activity.

- State authorities and Local government to control the movement down the innovation chain.

Monitoring and process auditing are considered as the instruments to select most promising research developments [49].

Monitoring of research developments is useful:

- To reveal the developments, that is in line with the corresponding domestic and foreign priority research and technology areas.
- To make decisions to support certain research subject areas.
- To direct applied research efforts towards market needs.
- To redistribute off-budget funds to the fundamental and applied research subject areas of the largest innovative potential.

Process auditing serves:

- To assess the potential of a research development.
- To assess the capabilities and potential of a team.
- To detect new techniques of a largest commercial potential (to detect new commercially promising techniques).
- To highlight the new opportunities of implementing research effort results: skills, experience, knowledge, equipment.
- To identify most efficient ways to make full use of every single opportunity.

To further develop its research-and –development plant, a Regional Entrepreneurial University should introduce and work into practice the following types of activity:

- Innovation marketing strategy, which involves shaping a market entry strategy, and a marketing mix strategy that begins with patents and licensing, project monitoring, pricing, and ends with product selling techniques.
- Normative-technical support (follow-through) of a product that involves legal regulation and technical documentation engineering.

Therefore, to successfully support and commercialize research innovation and integrate it into business, a university should create a research and technology complex of departments arranged into a single line of management and closely cooperating with regional sectors.

A university Innovative research activity structure is presented on the figure 5.

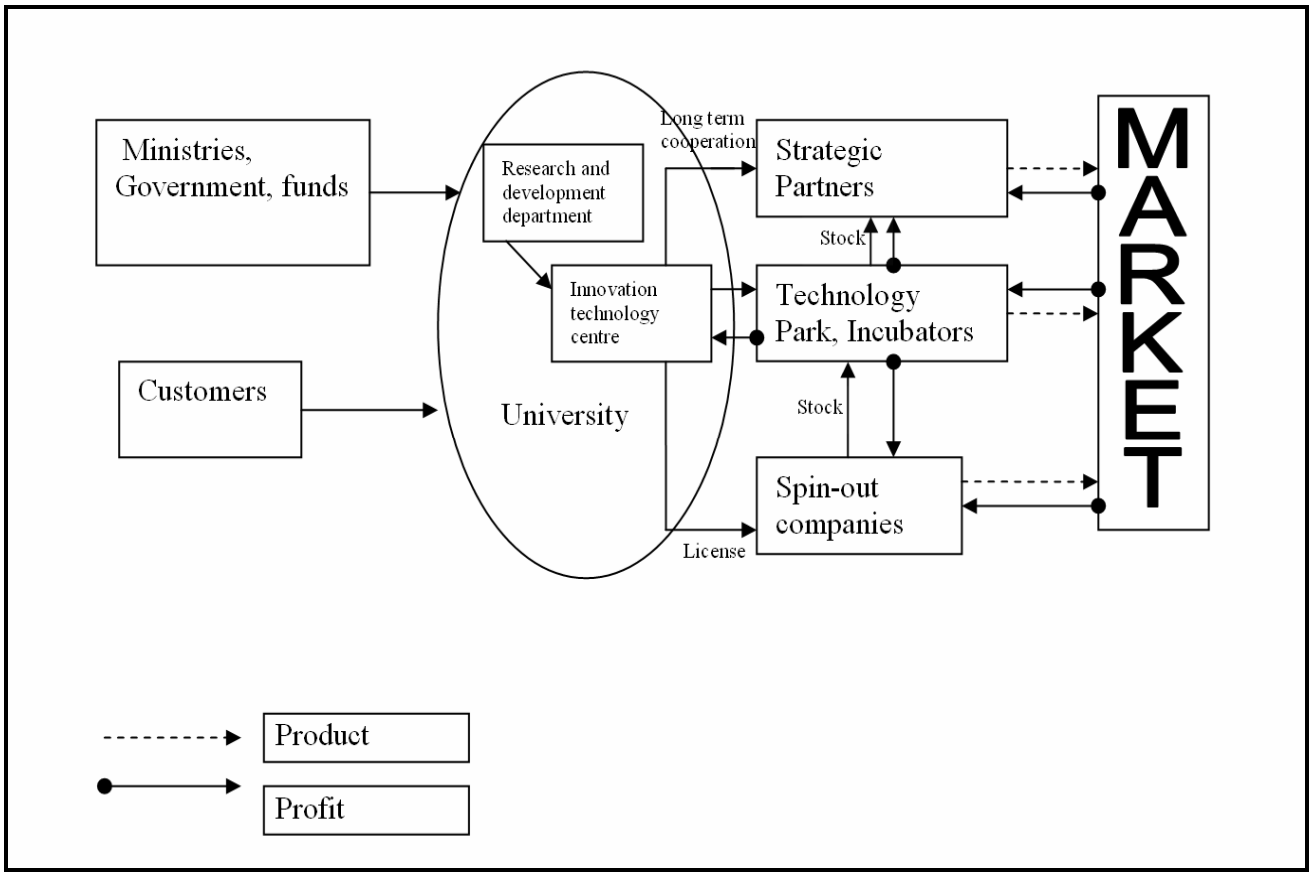

Figure 6. University Innovative Research Activity structure Market-Pull technology based.

The figure 6 demonstrates the cooperation between a university, business sector and government directed towards successful implementation of commercially promising products. The process is shown based on the Market pull model. This figure represents the Triple-Helix model in action, whereby several types of spin-out organizations are initiated.

A propelling Market-pull technology based on search for new ideas at the market. It is built on the search for and development of the decisions for industrial applications [47]. With this model the infrastructure is built starting at the customer's side, at the market. This approach also dictates to create

commercialization centers (with the primary goal of searching, selecting and transferring new techniques) targeted to market segments instead of institutions. At the Massachusetts Institute of Technology (MIT), for instance, there is a large number of labs to employ both professors and students. They consistently inform of the research developments applicable to business, in one way or other. This explains the fact that a huge amount of ideas applied by thousands of companies originate from the MIT labs and lecture rooms. This is the product of a propelling technique, a most powerful source of novel ideas.

The University of Colorado is a top ten USA public research university. A team of faculty, staff, and students from several departments took on the challenge of building the "Entrepreneurship" arm of the Initiative into a proactive business outreach effort. The "Energy Initiative" was launched in early 2006 to become an international force in solving the energy challenge through research, education and technology commercialization. "Based on extensive faculty input, Colorado University determined that a successful initiative must be highly interdisciplinary, integrating the University's extensive research in renewable and sustainable energy with its strengths in climate and environmental science, behavioral studies, policy analysis, and entrepreneurship It is focused on a Market -pull approach, seeking business input early on in research and technology development activities so that these efforts are informed by the needs of the industries that will ultimately commercialize and use new energy technologies.

2.2.5. Perfecting Educational Activities

Training specialists by innovative educational programs at a regional entrepreneurial university is aimed at providing them with such a level of knowledge, working methods and practical skills (competences) that should equip the young professionals with the tools to take the decisions and compete at a considerably more efficient and productive level than the specialists already working in the companies of their placement. Developing innovative education requires targeted shaping of special knowledge, skills and methodological

standards to offer the graduates a complete system of training, employing the following:

- Global information resources and knowledge bases, benchmarking oriented to the best domestic and foreign educational programs;
- International certification of educational programs to ensure their competitive strength at the world market;
- Entrepreneurial (concepts in the) content of instruction courses;

-problem-oriented interdisciplinary approach to instruction;

- Active techniques of “context situated learning” and “ learning by experience”
- Practice derived “case studies” techniques, and training oriented for personal and professional growth, business training, organizational activity games (role-play)
- Project-oriented techniques to teach team work when developing integrated solutions for practical applications (creative teamwork, project round-table discussions, interdisciplinary projects, projects-to order and the like)
- Broader involvement of undergraduates, postgraduates and doctoral candidates into research work, technology and project design incubators of the university and its strategic partners is useful to train specialists aimed at getting up-to-date key competences , like the skill to take decisions in dynamic situations, to apply the theoretic knowledge acquired to practice, rather than merely reproduce them.

A number of steps to be taken by a university to achieve better quality of education and higher impact on the labor market:

1. The specific professional activity the undergraduates are to be trained for should determine the content of the master’s degree program, which should be developed in cooperation with the interested employers.
2. The undergraduate\doctorate candidates’ professional training should meet professional qualification standards and potential employer requirements.

3. Subject areas of PhD research programs should be in line with the innovation areas developed by a university, and agreed upon with the interested parties - the state and business sector.

2.3. Conclusions from Chapter 2.

In the Chapter 2 the author of the research solves tasks as follows:

To identify the concepts of Entrepreneurial activity, innovative entrepreneurship, as applied to an education system;

To analyze literature and experiences of management, economics, strategic management and financial management;

To identify approaches of management as applied to an Educational Systems;

To systematize the existing domestic and foreign experience in creating Regional Entrepreneurial University;

To create transformation model for regional Entrepreneurial University;

To develop a plan for transforming a university into a Regional Entrepreneurial University based on the principles identified;

The tasks solved in this chapter allow to answer the Question 3 of the reserach:

Q3. What should be internally transformed in a traditional acadamic University to incorporate triple helix model for Regional develipment?

Regional Entrepreneurial University was defined by two main features: Entrepreneurial activity and Innovation in education. The criteria to define a university as an entrepreneurial type of institution are selected by the principles helping to determine the direction of its transformation. The model was developed by analysis and synthesis of infomation about Regional development, Triple Helix model, the working elements of entrepreneurial universities, most particularly, the framework of Clark, Etzkowitz, but mostly the author attepted to implement and to use some instruments of corporate management in application to univeristies. The model consists of five blocks containing instruments for trasformation of a university.

3. CHAPTER 3. RESEARCH METHODOLOGY AND INTERVIEW PROCESSING

3.1. Research Methodology

There are three basic ways of a substantiation in a science. Charlies Pierce names them deduction, induction and abduction [38]. Deduction by Pierce is extraction of a defenite part from the whole. This is the way of thinking from general notion to particular. Deduction means determining the conclusion. It is using the rule and its precondition to make a conclusion. Induction means determining the rule. It is learning the rule after numerous examples of the conclusion following the precondition. Abduction, or inference to the best explanation, is a method of reasoning in which one chooses the hypothesis that would, if true, best explain the relevant evidence. Abductive reasoning starts from a set of accepted facts and infers their most likely, or best, explanations. The term abduction is also sometimes used to just mean the generation of hypotheses to explain observations or conclusions [38]. Therefore, logical methods namely abstraction – concretization, induction – deduction and analysis – synthesis are used to analize the literature available and to systemize theory analized: applied models and theoretical economic preconditions, and the general principles of the enterprise organisation, studying strategic management methods and the methodology of corporate management, and research into the possibility of their application to the management of Higher Educational Institutions, and also studying what new approaches exist for university management as generated in the developed countries. By methods of synthesis evaluation criteria of different activities is developed for the definition of a university functioning as an enterprise: and the development of target indicators allowing the measurement of resulting outcomes. To aswer Questions 4,5,6,7 formulated in the Research, qulitative research namely interview questions is used to collect research data.

Qualitative research relies on reasons behind various aspects of behavior. Simply put, it investigates the WHY and HOW of decision making, not just what, where, and when. Hence, the need is for smaller but focused samples rather than large random samples, which qualitative research categorizes data into patterns as the primary basis for organizing and reporting results [39]. Qualitative methods assume information gathering in the free form, they are focused not on statistical measurements, but lean against understanding, an explanation and interpretation of the empirical data, being a source of formation of hypotheses and productive ideas [39]. The questions for the research were intentionally semi-structured. This semi-structured approach did ensure that all questions were put, but not necessarily in a standard sequence for all participants. This is entirely consistent with Silverman's views on flexible and adaptive interviewing and with the broadly held view of qualitative research [40]. Semi-structured methods ensure that a core of issues is covered but also allow space for other related and sometimes unexpected issues to also arise. Grounded theory method that was introduced by Glaser and Strauss in 1967, was employed in this study to analyze Research data [54]. According to Byrne (2001), grounded theory provides the researcher with strategies that can be used to build theories in areas previously unexplored or under explored [53].

This study therefore seeks to gain the views of be a selected group of senior university managers and experts in order to, primarily, build a conceptual model of organisational and managerial capabilities for a Regional Entrepreneurial university. It will note how they think about entrepreneurial capability in their own and other universities and how they see themselves as operating organisationally entrepreneurial. The study seeks to gain insight into their view on the entrepreneurial university as key player in Regional development by Triple Helix model.

3.2. Interview Processing

Research data was collected over possible partisipants of Triple-Helix model: University Top management, Government representatives, bussiness managers. A list of questions is devised that would generate dialogue between the

interviewer and the participants and encourage the dialogue to cover the main features of the current context for university, the views held by the participants about certain capabilities issues related to the entrepreneurial concept in the university, their views on their own and others' best practices in this domain, and their response to - either endorsement of or disagreement with - the prompt Figure 3 and Table 2.

The research data consists from managers of two the most famous Universities in Siberia, Russia and from managers of Tomas Bata University in Zlin, Government representatives, bussiness managers, which have relationships to University due to their work.

The sample data was chosen by three reasons:

1. These Siberia Universities propose themselves as Entrepreneurial Universities, and show its success for many years of great development and functioning.

2. The author has good connections with universities chosen, knows its background, history and development from both from analysis and private experience.

3. Tomas Bata University is a target of the research and being young prospective University, it may achieve its success by using appropriate Model suggested in the research.

The list of indicative questions shown at Appendix C, drew participants into dialogical exchanges where they not only provided responses to the questions asked, but also embellished on a number of related but unasked matters. They commented on the presented model with a view to making it more comprehensive, accurate and practically usable for senior university managers. The list of Questions consists from general questions given to all participants of the research and there are some specific questions, which were given personally to some participants according to their proffesional position. Also there are specific questions bult in order to be aswered by participants from Zlin Region. This separation of questions allowed the author:

1. To comprehesevly and fully cover the views of all participants according to their position in a Region
2. To get views of experts on the Model suggested from different universities of different contries and further to change Trasformation Model suggested if nessesary according to international expirience.
3. To get opinions and views specifically from experts in Zlin region in order to further develop appropriate model for TBU trasformation.

For this study, a sample of twenty was eventually located. This number is considered sufficiently large for an interpretive study to offer balance and diversity of views, whilst still generating a manageable volume of data. The sample is comprised of vice-chancellors, heads of faculties and departments, the chief executives charged with strategic management of universities, bussiness and government representatives. These practitioners were selected as the prime shapers of entrepreneurship goals and methods within the Triple-Helix model.

The interview was made among:

- Top managers from Tomsk Polytechnic Univeristy (TPU)
- Tomsk Univeristy of Control Systems and Radioelectronics (TUCSR)
- Tomas Bata Univeristy in Zlin (TBU)
- Scientific Park of TPU
- Bussiness Incubator and Technological Park of TUSCR
- Technological Innovation Center TBU
- Strategic Department of Tomsk Region
- Strategic Department of Zlin region

To answer Questions of the research the data analysis was devoted in two parts. The first part was aimed to answer question 4.

Q4: Is the Model of Regional Entreperenerial University developed in the research could be the core for University to become Entrepreneurial?

For this part a list of questions (see Appendix C) was devised that would generate dialogue between the interviewer and the participants and encourage the

dialogue to cover the main features important for universities, the views held by the

participants about certain capabilities issues related to the entrepreneurial university concept, their views on their own and others' best practices in this domain, and their response to - either endorsement of or disagreement with - the prompt Model developed by the author of the research.

For the second part of the Research Data analysis author analysed specific questions for participants of the research from Zlin Region. Therefore, the second part of the research was targeted on Zlin region and allowed to cover research questions 5,6,7.

Q5: Is it nesessary to implement Triple-Helix model for successful development of Zlin region?

Q6: Is there a need for trasformation TBU into Regional Entreprenerial University?

Q7: Could the trasformation model suggested in this research be used as an instrument for trasformation of UTB into Regional Entrepereneurial University?

3.3. Research Plan and Timeline

Table 3. Timeline Plan of Research

Dec 5 – Dec 25	Questionnaire preparation
Jan 3 – Feb 5	Target group selection
Feb 23 –March 15	Research Interview
March 15 – April 1	Results analysis and Interpretation of the Data
April 1 – April 30	Model redesign and recommendations development

Overcoming Barriers:

- Refusal of participation in research because of the time pittance.
- Absence (Unavailability) during of interview dates.

- Disagreement to participate in research owing to personal motives.
- A language barrier in using methods of interview and questioning from the side of interviewer and respondent (applicable to Zlin region only).

3.4. Questions Selection

To achieve the research goal author considered it necessary to analyze the views on organisational and managerial capabilities of an Entrepreneurial university among prospective participants of Triple-Helix. The Model (Figure 3) and its description (table 2) presented in Chapter 2 were intended to act a stimulus for discussion with the participants of the study by pulling together what is already available in various strands of literature around various entrepreneurship Frameworks and regional development by Triple-Helix model.

Most interviews were conducted in the participant's place of work and each interview was of approximately one to one-and-a-half hours' duration.

There are seventeen questions were given to participants of the interviewing, thirteen General Questions, and three questions due to Region position of a participant or specifically adressed to Zlin region.

Questions 1, 2, 3 and 7 were designed to get responses and opinions about Trasformation Model suggested in the research. To investigate the features of entrepreneurial univeristies, its development and instruments could be used for its implementation.

Questions 3, 4, 5, 6, 7, and 8 were designed to draw out the participants' understanding of the term 'entrepreneurial' in their university context, and to explore the meaning and place they attached to the concept. Also it investigates wthere they idetntify their University as Entreprenerial, what capabilities and features of entreprenership they could see for University to be applied.

Questions 9, 10 and 11 were disigned to investigate the role of Govenment of a country or/and region its influence to Research and Innovation, funding, supporting and politics.

Questions marked as „for Zlin region only“ were designed to draw out the participants' views of what being entrepreneurial might mean for Tomas bata Univeristy including their own to the extent that their views on and understanding of the concept.

3.5. Research Data Analysis

3.5.1. Coded Data from Interviews

The coded data, eventually sorted and assembled around thirty-three initial codes, is shown at Appendix D. All codes then analysed by groups according to their connection with each other. The twenty codes/themes emerging mostly from the first 1-8 questions were largely issues connected with various capabilities that were either fully or partly encapsulated in Table 2. This Table 2 and Model suggested did not provoke disagreement and actually provoked a degree of consensual interested and approving comment. Many participants used Table 2 as a kind of checklist by which on their own institutions' current practices, capabilities and mechanisms for entrepreneurship. Some noted where they could see that their university still had more work to do, but others noted where they felt they were already holding dynamic capability for entrepreneurship.

Questions 1-9, Codes **OSS, MC, CC, SM, TTC:**

Seventeen people mentioned the high importance of Organizational structure. Some of them being from Russian Universities mentioned, that it was the start point for them to transform their University. Three respondents from Government replied that for them it is quite necessary for University to have clear centralized structure for better cooperation, to address to the university as organization, not to separate departments. Three people from technological parks mentioned about difficulties connected with management structure of Universities and high level of bureaucracy. 8 people noted about the necessity of changing management system in University of TBU and identification of main management of university and main management of region. Five people from Russian Univeristies mentioned that corporate culture and management of univeristy should be harmonized. TPU

Univeristy worked on Corporate Culture development to become entrepreneurial from inside. Many of the participants believed that an entrepreneurial culture should be shared by most of the people in an entrepreneurial university to be entrepreneurial. By 2 respondents it was mentioned that the foundation of the external environment relationship department or changing the organizational structure by implementing some departments suggested in the Model should be done. Strategy management is considered as a necessity for University as organization, even does not have a goal of being Entrepreneurial. 8 Russian respondents answered that it was the beginning of University transformation and Mission and strategy are very important. One of the key criteria for suitability at very senior level could be leadership and entreprenerial approach on personal level as was mentioned by 2 people. Much of the response pointed to a need for technology transfer and commercialisation and mentioned its problematic related to low research activity.

Codes **GES, BEU, TEI, M, FM:**

Entrepreneurship is considered as an instrument for success by participants, however 5 people considered the term 'entrepreneurial' a little dated, more a statement of the nineties and meaning profitable. Their views on more current and accurate terminology are „Innovative". Good Entreprenerial stuff was mentioned by two people, however most of the respondents mentioned the nessesity of entreprenerial thinking among teaching and academia stuff as well as managament and students. Following by that, most of the people indicated points from Table 2 about entrepreneurship and innovation teaching arguethat it is the highly demand nessesity. Eleven participants made comment about Table 2 that was aggregated under code M – Marketing. The comments from participants suggest that Czech universities who want to locate and meet market needs quickly, who have a desire to be successfully entrepreneurial, really need high levels of this capability internally almost all the time.

They said that marketing should become the instrument for programs development and quality programs improvement to make them in response to

market and industries. Research activity of university is considered as finance base. 15 people agreed with the instrument of Fund-raising, but just 5 of them from Russia said they use this approach in their practice.

Codes **SP, CD, ISD, QM:**

Study programs are considered as high priority to be transformed according to demand. Several respondents mentioned about the engagement of business and industry practitioners to the educational programs. In TPU joint Business University Master degree program was started in 2008. Some of people from Business mentioned low correspondence of programs to the need of industry and social demand. However they showed wiliness to cooperate in this issue. TUCSR University respondents described high involvement of business to train and practice for students. They established big joint incubator and provide technology transfer to IT business sector. Quality management was considered as high essential for University by most of respondents. People from TPU described their approach to QM. There is a special department responsible for QM and program called Systematic Control Quality Program covering the university at all levels. Some people from TBU mentioned about QM approach as very needed in their University and control of study programs as a priority.

Questions 9-11: Codes **UE**, **DM**, **LF**, **AGR**, **RS**, **R:**

There are several people from Russia Universities and Government answered that they find strong influence of State Government on Universities. Current situation in Russia shows there is a strategy developed on national level to help universities become innovative and regionally effective. But sometimes university manages feel too much pressure from the Government side, which is sometimes does not lie together with strategies of University itself. People from TBU mention too low interest in involvement of university in to region strategies, and useless state decision making. Some of them say that the policy-making effort on national level is oriented on the right direction (education, research) however the university environment is afraid about suggested changes and try to slow down or stop the process using secondary and less important arguments. People from

Zlin region government see a lot of ways they use for university - like involvement in common regional development projects focused on regional development and development of academic, business and public sector as well as involvement of representatives of the Zlín Region in bodies responsible for development of the university. The state universities (including TBU) are established by the Ministry of Education and therefore there must be close cooperation. The Ministry of Education decides the amount of money for development of the university and there are also EU funds - Operational Programs Education for Competitiveness and Research and Development for Innovation which are managed on national level and the money from funds are allocated to the universities according to the development projects prepared by universities. They mention the entrepreneurial university as a leader in realization of actions defined in the Region Strategy and the excellence and possible cooperation fields of the university must be properly mapped and defined.

Codes **AC, RS, OPE, SEDGP, TP, THM:**

Respondents from Tomsk answered that Audit and Control, as well as Monitoring are the instruments they use in their research centers. They suggest it as necessary instruments for proper work, and even name it as control from the Government side. Few people in Zlin noted that governments at both Federal and State levels were inclined to over-control and audit, placing restrictions and substantial accountability requirements on all public funding.

There are several business incubators and technological parks established in cooperation with business and Government. Some of them mentioned Special Economic Zone of Tomsk Region as Triple –Helix Model implementation base. There are companies and research institutes work in cooperation and with support of Government. Region government provides low taxes, renting, energy and facilities discounts.

Respondents from Zlin Region consider Regional government as very important partner of the Entrepreneurial University since there are common interests for development of business sector and all development activities can be

coordinated or linked to get the synergy effect in development. Therefore the preparation and realization of common projects is suitable. They consider its role in supporting projects of University with broader objectives aimed at regional development and "can be one of buyers of results of research at the university (in the field of development of any areas)". They also mentioned, that there is Technological Incubator and innovation Center established in Zlin region. However, it does not provide fully the research and technology development going from University. Mostly its work concentrated on space leasing and consulting. But since that bodies already established, it could become a basis for Triple Helix implementation, cooperation with Clusters of the Region and building good mechanism of technology transfer. All respondents from Zlin concluded, that they see the Triple Helix model as sufficient for Zlin regional development, but some people think that the most important is the development of business sector which brings the innovation. The academic and public sector are supporting and have some benefits from the growth of business sector but the business is the crucial in the model. One of the respondents also mentioned - "Local government is currently not able to close the Triple Helix triad as they lack the connection and feedback both from university and business".

3.5.2. Data Sorted According to Questions 11-13 and targeted questions

What are the ways in which this model could be implemented? Are there any issues that you think are missing altogether, or are not clear?

Russian colleagues were possitive to the model presented. Some of them explained that most of the parts they think already implemented in their Univerisies, but at the same time they found some key points to use for upgrading different activities of University. For example Expanding the geography of student field practices and Integration of university and other research and production units in the educational process.

Concerning responses from Zlin, this question was significant for this research and some answers were very clear and ilustrative, therefore author of the research posts them. „Detailed identification of main management of university and main management of region with Entrepreneurial University problems (training) And then Step by step (creation of financing base, creation of department for external cooperation atc.)“

„Implementation should cover: promotional/educational activities (for better understanding and change), incl. Showing foreign experiences, some kind of agreement on the top, involvement of key stakeholders, step-by-step actions supported by shared “platform”, business (application)-driven orientation”.

“TBU has been for years too busy by increasing of students amounts and widening of study program spectrum. The implementation of the model is question of willingness of people and reaching of consensus among all people in managerial positions at the university. After this will be done the model can be implemented”.

“Important thing is system of financing of university – current system (based on number of students at particular faculties) brings only rivalry among faculties and low willingness to create new parts of the university (like University institute). The financing system is an external factor but the change is also needed to help the university to focus more on business sector”.

“Strategic decision, multi-channel financing system, assessment and motivation of managerial staff“.

Do you agree the features of Entrepreneurial Universities developed in the Table 2 are the core for being Regional Entrepreneurial University? Why?

All respondents from Tomsk universities found the features of EU presented in Table 2 as features of Successful University. They found most of them as features of their Universities as well. Also several of respondents replied, that the Model suggested is appropriate not only for Entrepreneurial University but also for all Universities responsible to the knowledge based economy. Zlin colleagues agree with all features and suppose it well structured and fully described. But, in application to Tomas Bata University, some of them think it is necessary to

generate blocks of the model and devote them into three groups. They argued, that there are three initial steps should be done at first – changing of management, education improvement and research activity. Also, one of the respondents said that there are a lot of entrepreneurial features are missed in current TBU system.

What would you give as an example of building excellent entrepreneurial capability from you experience? Who? What? How? With what effect?

In Tomsk, Russia respondents mentioned their Universities (TPU and TUCSR) as excellence of entrepreneurial capability. They argued that after several years of transformation and development these universities became most successful in the region and response to its needs.

In Czech Republic were mentioned: Institute of Chemical Technology in Prague, Technical University in Ostrava, because, according to the respondent there is a half of income is created by entrepreneurial activities in Universities mentioned.

Bata Shoe Company in Zlin (1920 -1939): world class entrepreneur (technology, operations, marketing, organization of work, personnel management and social development, corporate social and regional responsibility). Agriculture Farm (JZD AK) in Slušovice (1970 -1989): world class entrepreneur (research, innovation, technology, operations, organization of processes, management of finance, personnel management, professional development, social development, corporate social and regional responsibility).

Barum Continental Otrokovice (1993 – now): world class company (successful change from old type company to modern type, high competitive ability firm, with all attributes of excellent entrepreneurial capability: innovation, high quality, low cost, lean processes, human resource management, EMS, CSR, corporate culture).

International examples: Stanford University, Cambridge University, University of Jönköping, Sweden, TUH Helsinki, Finland, University of Twente, Holland.

Is making this university more entrepreneurial is one of your current goals? Why? What strategic gain are you seeking on this way?

Most of the respondents from Russia persuasively answered, that their current goal and strategy of Universities they run are not only to make it entrepreneurial but also to become most succesfull for many years in the future.

Several people from TBU answered that there are some departments try to build closer collaboration with business stakeholders to be more research and consultancy oriented. "We want to establish a suitable platform for collaboration (knowledge cluster) to speed the processes and involve more people on entrepreneurship". One Manager of TBU hopes that the priority of our university is an entrepreneurial state. A successful university must be an entrepreneurial according to two respondents. One manager of TBU answered that this Univeristy does not have the goal to be entrepreneurial.

Does your company have cooperation with a university? Are there ways to develop closer cooperation with a university? If it has, what ways do you see to improve that?

For this Questions three bussness representatives from Russia answered that they have some cooperation, one of them teach as a practicioner in TPU, and two cooperate through practice places for students from technical faculties. There are several cooperation links with TUSCR university in Tomsk. People replied that, not only some stuff from their company teaches on the faculty of Applied Informatics, but also they provide practice and work places for students, and participate in new ventures.

Unfortunatelly, some people in Zlin were answered they have no connections with Univeristy and didn't wish to participate in the research at all. But speaking with the director of Technological Center showed some possibilities to start cooperation in Plastic and Food technology area through Clusters of the region. The director answered they could provide connections between Univeristy and companies in order to establish joint programs or training for students and Univeristy stuff.

Do you see ways of cooperation through bodies of University presented on Figure 4 (Org. structure of University)?

There are four respondents answered, firstly, they are some kind of part of this structure being technological Parks and Incubators, but in the same time they wish to have more clear centralized management from Tomas Bata University side, and would prefer if TBU will have special departments as strategic department, research management department and marketing department in University in a hole, since now they see some luck of connection between faculties and other bodies of TBU. One respondent addressed to the Model suggested and mentioned about necessity to make university Complex "on one roof" to provide organizational well structured system management.

3.5.3. Targeted Questions for Zlin Region and Tomas Bata University

Could Zlin Region strategy be implemented in the way of Triple - Helix model from you opinion?

All respondents from Zlin region agreed with the Triple Helix Model and its suitableness for Zlin region development. However some of them made comments That " It depends on many factors: Understanding and wish of Government, Region and University" and "It depends on wiliness of Government to involve university and Business sector for decision making, as far as it should be joint in the Model presented". Some of people found it an ideal model for the priority directions showing where and how to build a "bridges" for mutual communication, trust and feedback.

It is necessary to build Entrepreneurial University for its implementation, or it could function as present University?

All respondents from Zlin region agreed that it is necessary to transform university into Entrepreneurial , and they are very clear regarding its role and importance in Zlin Region development. They sure, it should be changed in a next few years to correspond to the needs of market and due to Government politics

strategies. Some of them were detail answered, by saying what should be done in TBU: “To damage the zone of conformity for many academic people which are focused on education and do not bring the value added as they are here for long time, isolated from external world (be more performance oriented form the business/entrepreneurial point of view)”

„To make strategic decision and to accept action plans for the process of implementation of this decision. Perfecting new effective research system, changing organizational structure adequate to new goals and building new corporate culture“.

What do you think ‘being entrepreneurial’ would mean for TBU?

Two of the respondents addressed to Tomas Bata management. “Continuing to Tomas Bata work” is considered as Entrepreneurial approach for TBU. One respondent was detailed answering “More collaboration, less bureaucracy, mutual information, more flexible business and process oriented structure (vice-rectors, vice-deans), not so much rely on finance per student, more internationalization, higher expectations and demands from people, rewarding results and establish clear business performance indicators”. From point of view of three people the increasing of income from research and science would mean entrepreneurship for TBU. Also pedagogic issues were mentioned by participants. There is a necessity to elaborate study programs according to industrial and social demand. Internationalization was also considered as entrepreneurial feature for TBU. Close cooperation to business sector, readiness of TBU for collaboration with partners is mentioned as very important.

“Entrepreneurial TBU will be also more open to new ideas and activities carried out at the university will contribute significantly to economic development of the region”.

What management capability seems most important for TBU?

Some respondents found application of business approaches useful for TBU. Among them HR system, marketing, stronger strategic management and project management were mentioned.

Some people suppose that the sum of scientific, educational and manager abilities is the main tool for each university in the field of entrepreneurial environment. Few respondents consider flexibility, innovation, professional, management excellence, communication to industry and practice. Two people see leadership as the most important management capability.

"The most important is strong leader with vision respected and followed by all managers at the TBU. The communication of the leader towards all managerial levels about necessity of steps towards entrepreneurial university to reach the important consensus".

Codes **HT**, **MT, LT, SC:**

Participants had very little disagreement with any aspect of Table 2. They offered small differences of emphasis, and pointed to some minor limitations only. to be true in part. It seemed to the interviewer that most participants from Russia did in fact know of what was being suggested in the Model or that they knew it theoretically at least. Several openly said they had used the table as a sort of checklist of their own institutions' current practice in order to judge how they were progressing relative to the conceptually based models. However they found several useful points they could use for further development and upgraiding of Univerisity. Also they found methodological explanation of Model blocks very important and informative. Some of them think it could become the unified model for Trasformation.

Respondents from Zlin region were highly attracted by the Model suggested. Most of them made comments and aggrements on blocks of the Model. They found the material presented very substantial, precise and complex. Only one respondent answered, that there were no time possibility to read the Model and background to the research. But his comments were very useful and mirror some points from the Model.

3.5.4. Summary of the Interviewing Results

Most af the respondents found the model suggested useful and helpful for Univerisity development. Entrepreneurship is considered as an instrument for success by participants.

The high importance of University organizational structure being centralized and flexible is emphasised. Many of the participants believed that an entrepreneurial culture should be shared by most of the people in an entrepreneurial university to be entrepreneurial. Also the foundation of the external environment relationship department or changing the organizational structure by implementing some departments suggested in the Model should be done. Strategy management is considered as a necessity for University as organization

The comments from participants suggest that Czech universities who want to locate and meet market needs quickly, who have a desire to be successfully entrepreneurial Several respondents mentioned about the engagement of business and industry practitioners to the educational programs. . Study programs are considered as high priority to be transformed according to demand.

All respondents from Zlin concluded, that they see the Triple Helix model as sufficient for Zlin regional development, but some people think that the most important is the development of business sector which brings the innovation. Respondents from Zlin consider the entrepreneurial university as a leader in realization of actions defined in the Region Strategy. In application to Tomas Bata University, some of them think it is necessary to generate blocks of the model and devote them into three groups. They argued, that there are three initial steps should be done at first – changing of management, education improvement and research activity. Also, one of the respondents said that there are a lot of entrepreneurial features are missed in current TBU system.

4. CHAPTER 4. MODEL ADAPTATION FOR TOMAS BATA UNIVERSITY IN ZLIN

The organizing principle of the Triple Helix is the expectation that the university will play a greater role in society as an entrepreneur. The entrepreneurial university retains the traditional academic roles of social reproduction and extension of certified knowledge, but places them in a broader context as part of its new role in promoting innovation. Thus, The Zlín Region becomes the project coordinator, and also fulfils the role of the bearer of the regional innovation strategy and the warrantor of its future fulfillment. For activity supporting innovative entrepreneurship, the Zlín Region local government and Tomas Bata University are collaborating to develop university research meeting the specific needs of companies in the region, and producing human resources for the needs of local entrepreneurship. For example, through its Innovation Centre, TBU represents the basic element to create a research basis of the innovative environment [27]. Amongst its priority activities is the area of tertiary and lifelong education for science, research and innovation. TBU cooperates with businesses and institutions in selected areas of general and applied research through joint projects engaging its scientists, research workers and students. Another ground for local government-bussiness- university cooperation was created through establishing the Technological Innovation Centre, which is the joint activity of Tomas Bata University and the Zlín Regional authorities. Ther are several weaknessess and threats of Zlin region (see Appetdix A) that could be solved by Tomas Bata University development. For example, Lack of interest in vocational education among students, improper structure of available labor force and low attractiveness for the skilled labor force Low number of employees in R&D, Lack of qualified labour force to the companies' needs, Unused capacities and/or unsuitable focus of business incubators and R&D and technological parks, insufficient cooperation and links between university, R&D institutions, innovative entrepreneurship support organizations and entrepreneurial sector. Those issues could be solved step by step trasformation at all university levels.

The model suggested to respondents was founded useful and practically important for TBU. However some points described in Table 2, several people found not nessesary for TBU to be implenmented.

The analysis of views and opinions of Senior university managers, Goverment and bussiness representatives shows several issues should be solved at TBU as a priority. The trasformation of university takes a years to become fully successfull, but firsty, there are some initial steps should be done to start. Based on the analysis from the interviewing the author made several outcomes.

1. There is a strong nessesity for management to be changed using approaches of strategic management, quality management and corporate culture.
2. Education approaches should be reconsidered
3. Scientific research improvement by engagement of busness sector.

Author attempted to adopt the model for Tomas Bata University in Zlin after discussion and agreeing it with Senior managers of the University, Government and business representatives. To run the University's operating in the region according to Triple helix model, the university structure has to be changed. The target result of the changes should become creation of university Complex, new departments responsible for harmonization of the University and the Region strategic goals. Author suggests employing Triple Helix model for transformation of University, its structure and functions. The Model is divided to three sectors most important on this stage of TBU development. They are: management, Education, Research. The Model is presented on Figure 7.

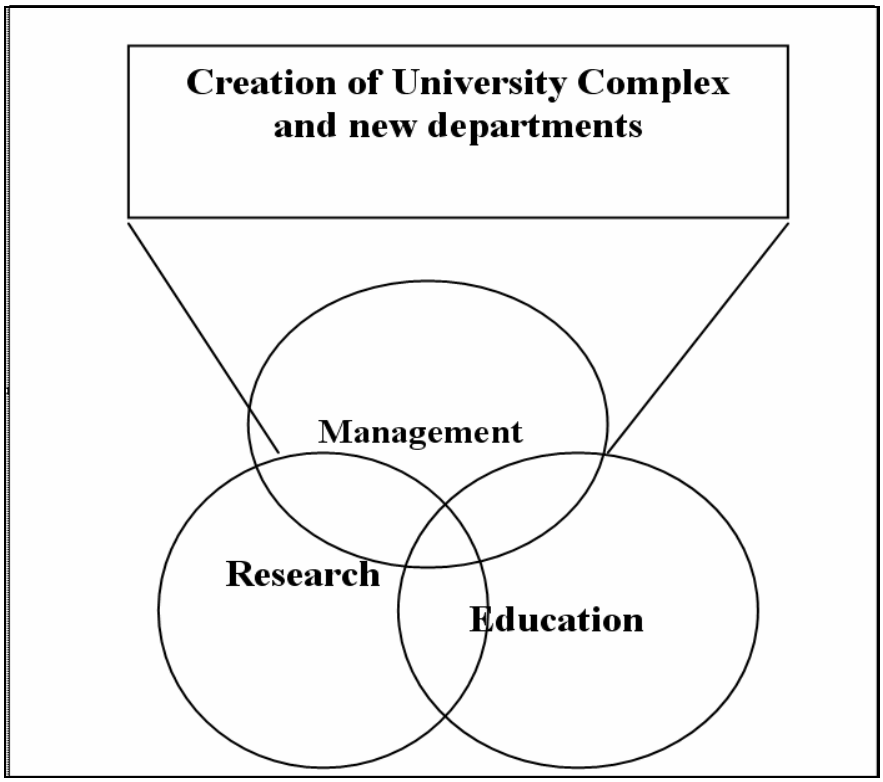

Figure 7. Resulting Model for Tomas Bata University in Zlin (Triple Helix based)

Management: There is a necessity to establish strategic management department in University not only responsible for strategy development, but also for strategic control and monitoring, to be able adequately and immediately react on internal and external changes. Mission and strategy of University should be defined and shared between all levels. "Products" of University should be formulated according to strategy and market need of region. Therefore, there is a strong necessity to do monitoring and marketing research. The Quality System Management should become the instrument for controlling the response of education programs to the region market need, the quality of education and research, as well as training and management stuff. For competitiveness increase it is necessary to develop and realize a series of measures on management of reputation of University. For this purpose it is necessary to conduct the analysis of a labor market for the purpose of working out and realization of measures on increase of competitiveness of graduates of TBU, maintenance of their employment. It is necessary to develop and introduce measures of adaptation of

students to a labor market: an industrial practice, a writing of course and degree works at the real enterprises. The University should begin work on development of target preparation of students and retraining of experts by request of employers, under the co-coordinated programs, financed by the customer. The second direction, carrying out of work with a management of the enterprises in a direction of formation of demand for target educational services, is realized through carrying out of joint conferences, seminars. One of effective mechanisms of increase of competitiveness of high school is its introspection by various criteria.

Education: Development of innovative education programms assumes purposeful formation of certain knowledge, abilities and methodological culture, and also complex preparation of experts at the expense of use: — world information resources and knowledge bases, with orientation to the best domestic and foreign analogues of educational programs; — the international accreditation of educational programs, I allow - щих to provide their competitiveness in the world market; — enterprise ideas in the maintenance of courses; — the problemno-focused interdisciplinary approach to izuche - нию courses; — active methods of "contextual training» and «training on the basis of experience»; — methods «case studies», based on practice; — the design-organised technologies of training to work in a command over the complex decision of practical problems.

Research: The developed infrastructure of university will allow it to integrate into innovative space of region successfully. The first stage of formation of an infrastructure — to obtain the data about an actual state of an infrastructure of innovative activity, its structure, level and tendencies of development of its components, to carry out the comparative analysis with other high schools and to consider prospects of integration of an innovative infrastructure in innovative space of region. On the basis of university, probably, most qualitatively to organise improvement of professional skill and retraining of experts for the enterprises. Creation of a regional complex consists in the following: the Regional centre of a professional training for innovative activity Introduction of innovations in educational process by business attraction. Monitoring of new tendencies

(innovations) in the directions claimed in region. One of university problems is maintenance of the regional social order for preparation of experts for realisation of target programs operating in region; the organisation of scientific researches on subjects of region for realisation of regional and international programs.

To trasform university into regional Entrepreneurial it is necessary to perform the following actions:

- To train professor and teaching stuff to work effectively in collective, involving for carrying out of researches, students, post-graduate students and providing a close connection of scientific and educational activity;
- Scientific activity of teachers to plan taking into account the scientific directions generated at university. It is recognisable that in the conditions of the limited resources university collective should concentrate the efforts to realisation of overall objectives and high school problems, as by the current moment, and on prospect so that from the enclosed resources to receive real return – scientific and financial.
- To decrease an academic workload of teachers, to redistribute it more towards scientific and innovative activity. In the conditions of a scientific researches financing competition of any level occurs on a competitive basis, therefore from the head of scientific personnel certain qualification and experience on management of projects that it is better to execute others scientific researches (to win the grant, the project, the tender) is required. Seeing this problem, at university being the complex system such operating projects should be developed.

To implement the model author created a Transformation Algorithm, presented in Appendix E. This Algorithm consists of Regional Entrepreneurial University criteria, developed in Chapter 2, and Blocks for transformation described in Chapter 2 and suggested in Chapter 4 for Tomas Bata University. The Indicators for measurement could be developed by University after creating specific programs of transformation targeted directly to parts to be transformed.

The definition of objectives is the first stage of the regional Entreprenerial Univeristy approach. The basis of the Algorithm is the Trasformation Plan development. Primary, strategy development, its strategic directions, the mission and the purposes, the balance of interests of all groups thus should be observed. The concrete definition of strategic directions of development of university which will allow to pass from statement of the global purposes to practical planning. Then program of innovations and changes in university serving as the basic core of control should be realised by project management approach.

At last stage of performance of algorithm it is necessary to estimate conformity of model chosen and to check up communication of university with region — there is a real contribution to development of economy of region?

CONCLUSION

The model Triple-helix has been developed to define the regional transformation mechanisms applied to build-up innovational regions, whose economic growth is propelled by knowledge. Initiation of the triad Goverтment – university- industry is the key factor of regional development. Although universities keep their traditional functions of knowledge accumulation and dissemination, research and socialisation, they also play an important role as centers for technology transfer [28].

Thus, the unique educational, research and economic status of a university enterprise in which the new and traditional roles serve to enhance each other, is putting the university into a central position within regional economy.

The main function of an entrepreneurial university should be introducing the organizational management methods targeted to support the research of theoretical and practical value for the local region.

The academic foundation of such an "innovative region" provides for its ability of regular self-rejuvenation and finding new ways in technological development. [29]. The effectiveness of innovation is largely dependant on a network of community and private organizations created to support start-up firms, to finance scientific research and to furnish initial stock (Schumpeter 1951) [3]. The reading-book examples of innovative regions are Silicon Valley (California), Oxford and Cambridge (Great Britain), Princeton (New Jersey), their names being the images of a success story. The universities in these regions were directly involved in establishing new companies, possessing research personnel and marketing their research developments. These regions are highly attractive to investments. The universities in these regions take active part in building commercial connections with business community – they constitute a strategic element of regional innovation system. The universities encourage entrepreneurship among their students and staff in a variety of ways. They have transformed into entrepreneurial universities. These successful examples have served as an inspiration to other regions in the world. In Russia, thanks to the

government granting, four regions started their new era of development in the knowledge based economic conditions. The experience with the successful development of European and Russian universities has shown that no alternative exists to the commercialisation of educational activities and scientific research, which also means in the entrepreneurial style of an organisation under the modern conditions of market globalisation, which has lead to a higher level of competition in the educational market. The entrepreneurial approach should permeate throughout the entire university - from the students' to the professors levels. This means the encouragement of a specific state of mind and intellectual approach to science and community which would enable rapid responses to the on-coming challenges and the acceptance of new ideas.

With a view to better understanding the organizational capabilities that universities in their regions need to develop to become more entrepreneurial and adequately participate in the regional development the author of this paper undertook a larger study in which a theoretical transformation model of entrepreneurial University was developed. The model Triple-Helix was taken as the most appropriate for regional development in knowledge based economy.

This study therefore seeks to gain the views of be a selected group of senior university managers and experts in order to, primarily, build a conceptual model of organisational and managerial capabilities for the entrepreneurial university in Zlin Region. Secondly, it notes how they think about entrepreneurial capability in their own and other universities and how they see themselves as operating organisationally entrepreneurial. The study seeks to gain insight into their view on the entrepreneurial university as key player in Regional development by Triple Helix model. Regional Entrepreneurial University was defined by two main features: Entrepreneurial activity and Innovation in education. The criteria to define a university as an entrepreneurial type of institution are selected by the principles helping to determine the direction of its transformation. The model was developed by analysis and synthesis of infomation about Regional development, Triple Helix model, the working elements of entrepreneurial universities, most

particularly, the framework of Clark, Etzkowitz, but mostly the author attepted to implement and to use some instruments of corporate management in application to univeristies. The study concludes that there are five areas of capabilities involved in building a Regional Entrepreneurial university. In this study they are labelled as follows: perfecting (upgrading) scientific effort, perfecting educational activities, forming a multi-channel financing base, building university corporate culture and internal competitive environment, an organizational structure adequate to new goals and management/ autonomy methods.

All participants of the interview concluded, that they found the Triple Helix model sufficient for regional development. Respondents from Zlin consider the entrepreneurial university as a leader in realization of actions defined in the Region Strategy. From their opinions, there are three initial steps should be done at first – changing of management, education improvement and research activity in application to Tomas Bata University. Author attempted to adopt the model for Tomas Bata University in Zlin after discussion and agreeing it with senior managers of the University, Government and business representatives.

Author suggests employing Triple Helix model for transformation of University, its structure and functions. The Model is divided to three sectors most important on this stage of TBU development. They are: management, Education, Research.

Benefiting from Triple helix model Zlin Region may achieve its main economic goal: providing a well functioning infrastructure and increasing the population's quality of life. This can be gained through creating entrepreneurial university able to establish the strong ties between business-government-university and local community Tomas Bata University has become one of the major contributors to regional economy, major regional employer and purchaser of services. As an entrepreneurial university it will serve as a potential hothouse to grow new interdisciplinary scientific fields, new sectors of industry to contribute to the local regional growth.

THE THEORETICAL AND PRACTICAL APPLICATIONS OF THE RESEARCH

The own contribution of the researcher in this study imply the following:

- The concept of Triple-Helix model as the most successful model for regional development in knowledge based economics is analyzed.
- Prerequisites for transforming a university into an entrepreneurial organization are summarized;
- The approaches to creation of Entrepreneurial University in the USA, European Union and Russia identified;
- A comparative analysis of different university models by different criteria, formulating the specific features of a regional Entrepreneurial university and its similarities and differences to other existing models;
- The concept of regional Entrepreneurial University as a basic existing model of an educational facility is developed;
- Criteria of Regional Entrepreneurial University for cooperation in the Triple-Helix are developed;
- The plan for transformation of an educational facility into an Entrepreneurial University is developed.
- The Model for Tomas Bata University in Zlin is developed and adoptive according to the opinions and views of experts.

The Theoretical Applications of this dissertational research topic are based on the use of a scientific approach to the development of a Innovative regions and the model of Entrepreneurial University as a key element of regional development.

The Practical Applications of this research result in raising awareness about the current opportunity of using the principles developed in the study for the successful implementation of the Triple-Helix model in regions and transformation of HEI into a regional, innovative and entrepreneurial university. The findings and results can be used as recommendations for regional organisations. It will be possible to use the materials, conclusions and suggestions of the research project for the perfection of Higher Educational Institutions` innovative activities.

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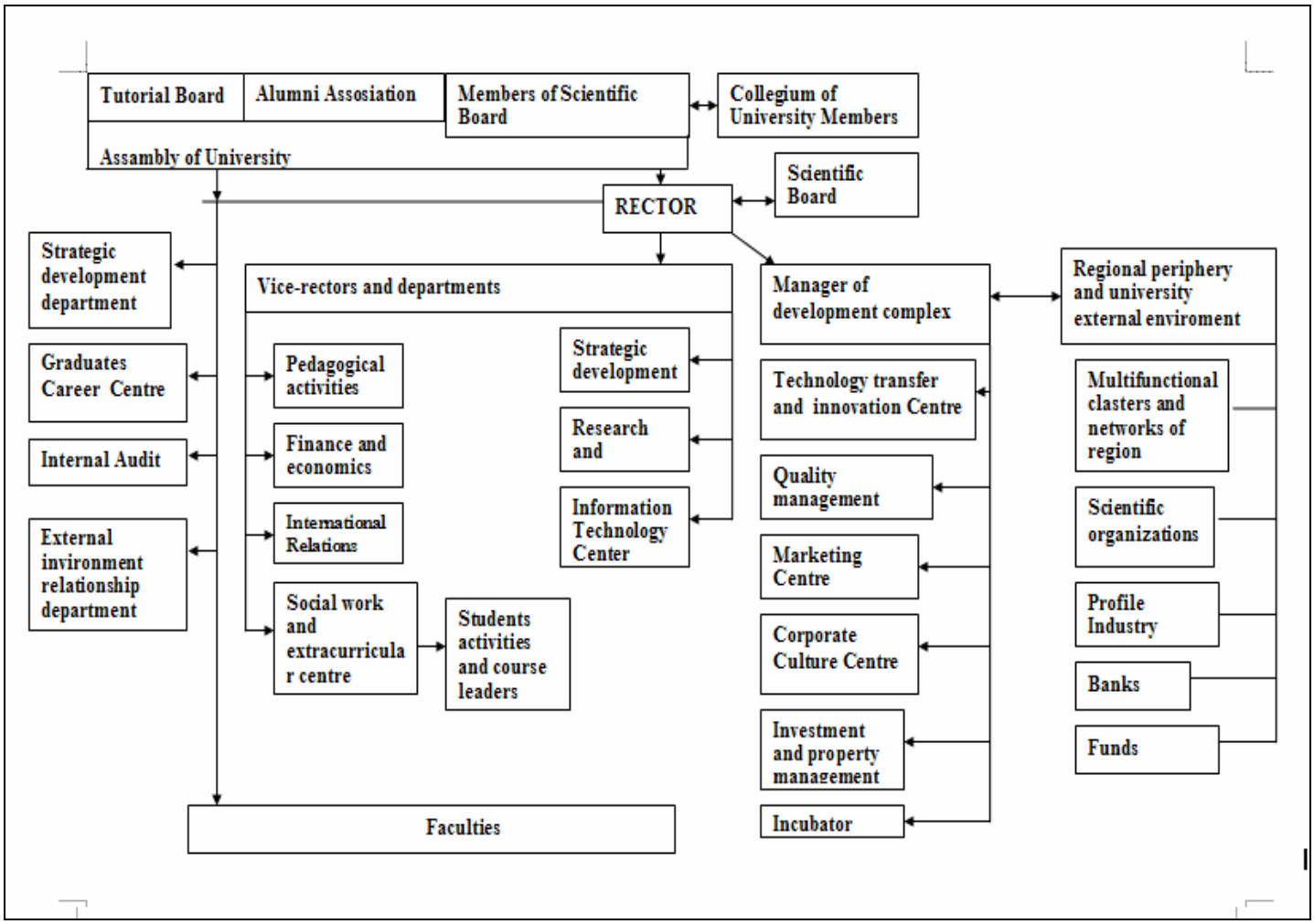
APPENDICES

Appendix A. SWOT-Analysis of Zlin Region

	Public sector, strategies to influence economic development	**Human Resources**	**Base for R&D and cooperation of R&D with entrepreneurs**	**Entrepreneurial Sector**
STRENGTHS	✓ Working cooperation between innovative entrepreneurship and regional development supporting organizations ✓ Strengthening pro-investment environment	✓ Growing number of employees in R&D in Zlín Region	✓ Developing university in the region with its wide range of study programs and capacity for R&D (Tomas Bata University in Zlín) ✓ Institute for testing and certification ✓ Establishing business incubators and R&D and technological parks	✓ Establishing clusters higher than average share of innovative companies in industry and services in comparison to the Czech Republic level ✓ Growing number of high-quality companies able to cooperate in projects with external partners ✓ Partnership approach of companies in the Region to an academic sector ✓ Strong industry branches: plastics, rubber and chemical, electrical and optical equipment, food production and fabricated metal product
WEAKNESSES	- Peripheral position of the Zlín Region and bad transport accessibility - Low attractiveness of the Zlín Region for investors - Limited competence of regional government to create innovation support tools - Low public expenditures on R&D	- Lack of interest in vocational education among students - Improper structure of available labor force and low attractiveness for the skilled labor force - Low number of employees in R&D	- Insufficient support to create spin-off companies by and university - Insufficient cooperation among universities, R&D institutions, - Low motivation for academic sector to convert R&D results into entrepreneurial innovation - Inconsonance of R&D focus and industry branches in the Zlín Region	- Low interest of entrepreneurs in cooperation to create innovative environment - Hardly accessible consulting service in the field of innovation

OPPORTUNITIES	✓ Use of industry linked to innovation activities ✓ Involvement of regional institutions and firms ✓ Cooperation in transfer of the best practice fulfillment of development goals of the Region in innovation ✓ Attracting investments to industry and R&D, involvement of venture capital ✓ Engagement of investors and labor force by improvement of the accessibility to the region	✓ Development and support to vocational schools and ensuring labor force for industry ✓ Development of secondary schools with regard to need of human resources for innovation ✓ Development of Tomas Bata University in Zlín in the field of human resources education for innovation	✓ Support to spin-off companies establishment ✓ Establishment, development and effective use of business incubators and R&D and technological parks ✓ Use of R&D capacities and use of increasing number of people employed in R&D, purpose financing of R&D (links to innovation) ✓ Development and use of capacities to focused support to innovation entrepreneurship and links between R&D and industry (business) ✓ Creation of conditions motivating to cooperation of companies with Tomas Bata University in Zlín and other R&D institutions	✓ Active search for new markets by companies - active marketing ✓ Development of strong branches revitalization of traditional branches using new tech ✓ Establishment and development of clusters ✓ Grant possibilities and proposals elaboration ✓ Establishment of Centers of Shared Services for concrete manufacturing ✓ Positive promotion of companies' innovation ✓ Companies involvement in international projects and networks
THREATS	- Lack of sources for investment in transport infrastructure - Change of political situation and development priorities - Low understanding of needs in the field of innovation - Entrepreneur isolation of the Region and low level of cooperation with other regions	- Difficult motivation and hiring of new qualified workers because of low salary level in R&D - Emigration of qualified people and university graduates from the Zlín Region - Lack of qualified labour force to the companies' needs	- Unused capacities and/or unsuitable focus of business incubators and R&D and technological parks - Insufficient cooperation and links between university, R&D institutions, innovative entrepreneurship support organizations and entrepreneurial sector	- Companies and investors moving out from the Region - Underestimation of R&D cooperation in clusters - Low readiness of companies to use new approaches in doing innovation - Low confidence of entrepreneurial sector to cooperate with regional self-government on regional development activities

Appendix B. Organizational Structure of a Regional Entrepreneurial University



Appendix C. Questions for the Research "Entrepreneurial University for development of Innovative regions"

General Questions:
1. Have you had an opportunity to read the draft model of university transformation that I sent you?
2. What organizational systems, structures and processes are the most important in building an entrepreneurial university from your point of view?
3. What are the ways in which this model could be implemented? Are there any issues that you think are missing altogether, or are not clear?
4. What would you give as an example of building excellent entrepreneurial capability from you experience? Who? What? How? With what effect?
5. Why do you think universities are pursuing the goal of being entrepreneurial?
6. How does the current government policy cooperate with university in your view?
7. What is the role of local government in the relations with Entrepreneurial University from your point of view?
8. What should be done internally to make the university entrepreneurial?
9. What response from Government would you expect for developing a network with a university?
10. Do you agree the features of Entrepreneurial Universities developed in the Table 2 are the core for being Entrepreneurial University? Why?
11. What role of Entrepreneurial university you could see in the regional development?
12. Could the Triple- Helix Model become the instrument for the development of an Innovative Region? What do you think?
13. Any other comments?
14. Your suggestions
For Universities Senior Managers only:

Is making this university more entrepreneurial is one of your current goals? Why? What strategic gain are you seeking on this way?
For Business Representatives only:
Does your company have cooperation with a university? Are there ways to develop closer cooperation with a university? If it has, what ways do you see to improve that?
For Zlin Region participants of the research (Senior managers, business and Gov. representatives:
Do you see ways of cooperation through bodies of University presented on Figure 4 (Org. structure of University)?
Could you find any possibilities for cooperation with university through activities of university presented in Table 2 (Description of entrepreneurial components for transformation to Entrepreneurial University)?
Could Zlin Region strategy be implemented in the way of Triple - Helix model from you opinion? It is necessary to build Entrepreneurial University for its implementation, or it could function as present University?
What do you think 'being entrepreneurial' would mean for TBU?
What management capability seems most important for TBU?

Appendix D. Codes Generated for Coding Interview Data

Codes generated from responses to Questions 1-9

OSS Organizational structure, system
MC Management change
CC Corporate culture
FM financial mechanisms
SM Strategy management
GES Good entrepreneurial staff
SP Study programs
CD Course development
BEU Being Entrepreneurial University
ISD Industrial and social demand
M Marketing
TI Teaching improvement
TEI Teaching entrepreneurship and innovation
QM Quality management
TPI Technology Park and Incubator
THM Triple helix Model

Codes generated from responses to Questions 9-11

UE University Environment
DM Decision Making
LF Legislation and Finance
AGR Absence of Government Role
RS Region Strategy
R Regulation
AC Audit and Control
RS Research Support
OPE Operational Programs Education
SEDGP Science and education Development Government Program
TP Technology Park
THM Triple helix Model

Codes generated to assess general level of specific engagement with the Model:

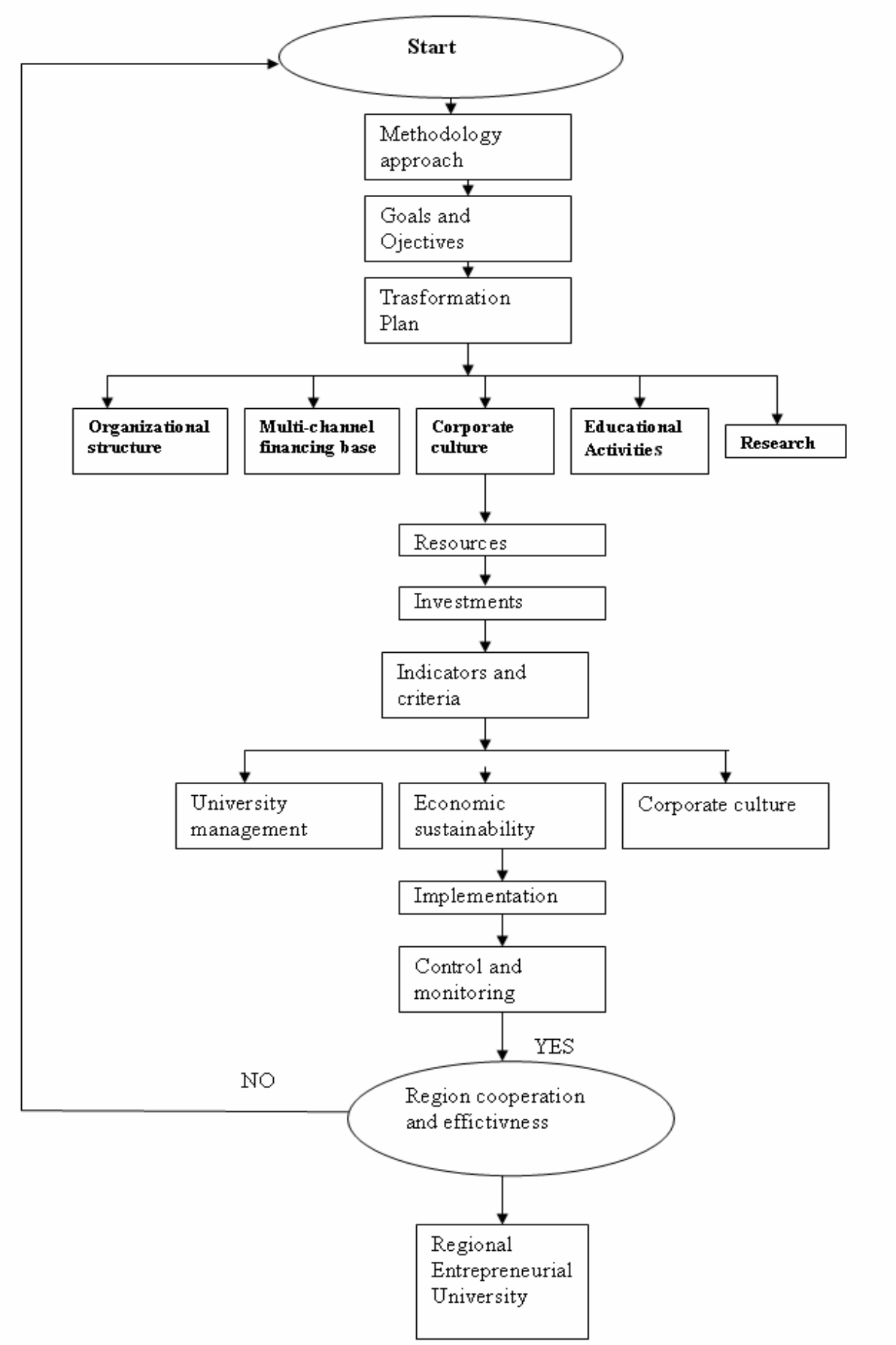
HT High engagement with Table. Specific comment and reference to many ideas within the Model.

MT Medium engagement with Table. Moderate reference to ideas and specifics within the Table.

LT Low engagement with specific ideas and points within the offered Table.

SC Specific comment on the model suggested.

Appendix E. University Transformation Algorithm



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1. Burykhina M. Educational Management: University on the way to innovation. // 10th Int. conf. MEKON. Technical University. Ostrava – 2007 ISBN: 978-80-248-1324-0
2. Burykhina M. The role of entreprenerial universities in human capital formation of the region // Int. conf. „Liberec Ecomomics Forum“ , Technical university of Liberec. Liberec – 2007 ISBN: 978-80-7372-244-9
3. Burykhina M. Running an Entrepreneurial University "Visshee gumanitarnoe obrazovanie 21 veka: problemy i perspectivy". // Materialy tretey megdunarodnoy nauchno-practicheskoy conferencii. - Samara 2008
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5. Burykhina M. The role of a university in regional development. The government-business-university relations. // The 8th International Conference on Knowledge, Culture and Change in Organisations. CAMBRIDGE, England - 2008
6. Burykhina M., Friedel L. Entrepreneurial University as a Core of Triple Helix: a Potential (not only) for the Zlin Region and its Innovation System. // Santander the 3rd International Seminar “Regional Innovation Policies”. Santander, Spain – 2008 ISBN: 978-84-8102-528-6
7. Burykhina M. The Role of a University in Regional Development. The government-business-university Triad. The International Journal of Knowledge, Culture and Change Management, Volume 8, NUMBER 9, 2008 ISBN: 1447-9524
8. Burykhina M. A Transformation Entrepreneurial University Model for the Development of “Innovative Regions”. The 9th International Conference on Knowledge, Culture and Change in Organisations. Boston. USA - 2009

CURRICULUM VITAE

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Worked as a manager of TEMPUS project in cooperation with Swedish University. Developed and managed qualification improvement courses for top-management in educational institutions in cooperation with the University of London. Planned and managed conferences in TPU.

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01.2003 – 06.2006: "See more" International Agency, Guide – an interpreter of English.