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## CONTENTS

ACKNOWLEDGEMENTS .....	4
CONFERENCE STEERING COMMITTEE MEMBERS .....	5
CONTRIBUTORS .....	6
PREFACE .....	7
Kairat Kurakbayev and Aida Sagintayeva	
1 FOSTERING INNOVATION AND ENTREPRENEURSHIP: THE TAU MODEL ...	12
Joseph Klafter	
2 ENTREPRENEURIAL ECOSYSTEM AT UNIVERSITIES: FORMATION AND DEVELOPMENT .....	16
Assylbek Kozhakhmetov, Nina Nikiforova and Sholpan Maralbayeva	
3 INTERNATIONALIZING CURRICULUM FOR INNOVATION: OPPORTUNITIES AND CHALLENGES FOR ENTREPRENEURIAL UNIVERSITIES IN KAZAKHSTAN .....	24
Sholpan Tazabek	
4 MOOCS AND THEIR IMPLICATIONS FOR TRADITIONAL HIGHER EDUCATION INSTITUTIONS .....	29
Abay Zhussupbekov	
5 LINKING RESEARCH TO KAZAKHSTAN'S STRATEGIC PRIORITIES: THE CASE OF INTERNATIONAL FACULTY AT NAZARBAYEV UNIVERSITY .....	34
Aliya Kuzhabekova, Jack Lee and Magzhan Amangazy	
6 ENTREPRENEURIAL UNIVERSITIES IN THE FORMATION OF NATIONAL INTELLECTUAL AND SOCIAL CAPITAL .....	41
Marat Ibatov, Valeriy Biryukov, Gulnar Zhaxybayeva and Gulnaz Mussina	
7 THE INSTITUTIONAL MIDDLE-INCOME TRAP .....	47
Dennis de Tray	

## **ENTREPRENEURIAL ECOSYSTEM AT UNIVERSITIES: FORMATION AND DEVELOPMENT**

Assylbek Kozhakhmetov, Nina Nikiforova and Sholpan Maralbayeva

This paper examines issues of developing an entrepreneurial ecosystem at higher education institutions in the context of Kazakhstan. Authors consider the entrepreneurial university as a system that has its own infrastructure and is an integral part of the ecosystem as a whole. State and businesses are active participants of entrepreneurial ecosystem's formation process at university. Despite the fact that many studies (Röpke, 1998; Clark, 1998; Etzkowitz & Leydesdorff, 2008) focus on the problems of formation and development of entrepreneurial ecosystem and its infrastructure, there is no universally recognized definition of the term "entrepreneurial ecosystem". In Kazakhstan, the formation of entrepreneurial ecosystem is at its early stage. This paper discusses problems related to the underdeveloped entrepreneurial ecosystem and defines main reasons that hamper the development of entrepreneurial universities as part of the ecosystem.

### **Introduction**

In order to increase university graduates' competitiveness in local and international labour markets, Kazakhstan has begun the process of transformation of traditionally teaching-only universities into entrepreneurial ones and has defined the role of universities as participants of the new economic policy. Entrepreneurial universities are the most important actors of entrepreneurial education that serve as a springboard for preparing people to work in the new environment and centralizing innovation economy of the state. In Kazakhstan's context, the rationale for establishing entrepreneurial universities is defined by the following factors.

- Transition of Kazakhstan's economy to the innovation model of development.
- Increased competition on local and international markets for research and educational services.
- Different requirements of business community for training prospective employees that are able to compete in local and international labour markets.
- Need for the development of entrepreneurial thinking and entrepreneurial spirit among faculty, students and other stakeholders.

Formation and development of entrepreneurial universities is not possible without the creation of an effective entrepreneurial ecosystem that constitutes a basis for successful functioning of entrepreneurial universities and allows faculty members and research staff to be involved in entrepreneurial activity (Röpke, 1998). The quality of such an ecosystem is the key factor for successful transfer of technology. Special Report of Intergovernmental Panel on Climate Change (IPCC) "Methodological and Technical Aspects of Technology Transfer" has defined the term "technology transfer" as a broad set of processes covering the flows of "know-how", experience and equipment for mitigating and adapting to climate change amongst different stakeholders" (IPCC, 2000).

### **Ecosystem as a concept**

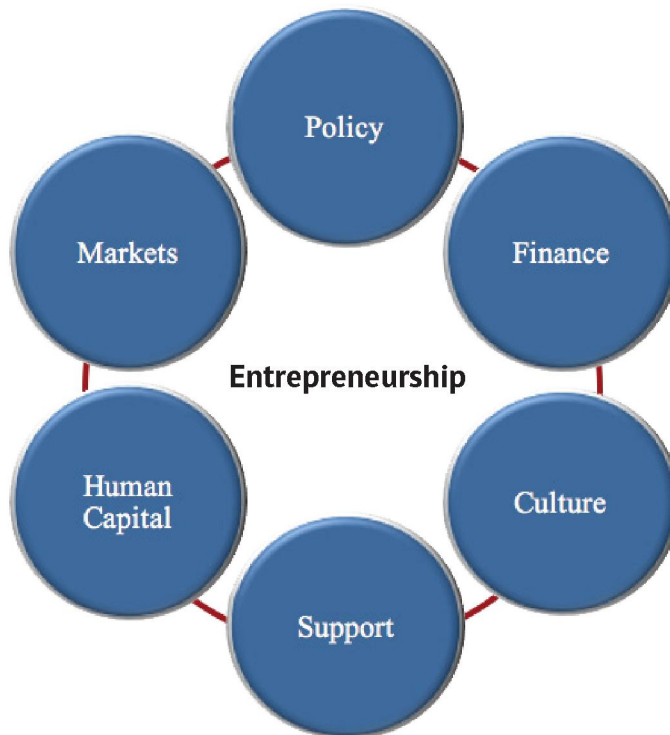
The term “ecosystem” started to be used a century ago. Firstly, the term was mentioned in the article by British ecologist, Sir Arthur George Tansley, that was published in the ‘Ecology’ Journal in 1935. In his article, Tansley notices that a combination of all physical elements forms an environment, where “ecosystems (...) are of the most various kinds and sizes” (1935, p.299). Referring his work to biology, Tansley states that the idea of ecosystem can also be used in many areas and fields (1935, p.304).

The term “business ecosystem” was proposed by James Moore in 1996. Since then, the term has been transformed into an “entrepreneurial ecosystem”. Currently, this concept is widely used in academic and business fields. Basically, it is assumed that an entrepreneurial ecosystem as an innovative structure should contain four basic elements: idea, entrepreneurial experience of ecosystem’s participants, sources of financing and network that combines these elements into a comprehensive system (Kopeikina, 2008). Another view has been expressed in the Report of the World Economic Forum (2014, p.6) and has identified the entrepreneurial ecosystem “as a system of interrelated pillars that impact the speed and ability with which entrepreneurs can create and scale new ventures in a sustainable way” that is based on the following eight ‘pillars’.

1. Accessible markets
2. Human capital/workforce
3. Funding and finance
4. Support system/mentors
5. Government and regulatory framework
6. Education and training
7. Major universities as catalysts
8. Cultural support

This approach has been developed on the basis of surveys on entrepreneurship conducted by several parties. E&Y, OECD and Professor Daniel Isenberg of Babson College, Founder and Executive Director of the BEEP Project (Babson Entrepreneurship Ecosystem Project) were among those parties (World Economic Forum, 2014, p.238). Figure 1 shows the Eisenberg’s model that consists of six basic elements of the entrepreneurial ecosystem.





**Figure 1: Six Domains of Entrepreneurial Ecosystem**

*Markets* consist of consumers that represent the target audience for business. For better functioning of the market, a company should have qualified staff that makes up the *human capital* and possesses key business competencies. *Policy* is determined by business strategy of a company. *Financing* of entrepreneurship is carried out from a variety of sources, private capital to state grants. Considerable importance of *support* to business from society implies that there is an adequate perception of the business existence as well as institutional and infrastructural support. Entrepreneurial *culture* enables more efficient functioning of the entire ecosystem. According to Eisenberg, without proper education and strong culture, business financing does not lead to entrepreneurship (Eisenberg, 2011).

#### **The current situation in Kazakhstan**

Kazakhstan is in the process of forming an entrepreneurial ecosystem that is basically made up of state actors and financial support coming from the state budget (national and local budgets, resources of organizations with state participation) as well as with the support from development institutions that have been established by the State. In order to facilitate coordination of the innovation development process and securing the state support, the government has created the joint stock company “National Agency for Technological Development” and has launched the State Program for support and development of business “Business Roadmap 2020” (2015).

The process of creating entrepreneurial universities is still at its early stage in Kazakhstan. In most cases, higher education institutions (HEIs) in Kazakhstan have been teaching-only institutions. Development of basic approaches to transforming Kazakhstan’s higher

education sector into entrepreneurial universities is conducted by many higher education institutions across the country with Nazarbayev University, Alma Management University, Pavlodar State University, Taraz University of Innovations and Humanities, Karaganda State Technical University, Karaganda State Medical University among them.

Despite the fact that certain work towards the transformation of traditionally teaching-only universities into entrepreneurial and towards the formation of academic institutions' ecosystem has been carried out in Kazakhstan, a number of problems hampering the process are identified.

- Many Kazakhstani HEIs do not have essential infrastructure for innovation.
- There is a shortage of qualified managers of technology transfer.
- The legal framework of entrepreneurial universities' management and governance and their structures is underdeveloped.
- There is no shared understanding or common view of the key concepts such as "entrepreneurial education", "entrepreneurial university", and "entrepreneurial ecosystem of university".

To tackle the problems mentioned above, the working group for the development of the Concept "Formation of Entrepreneurial Education in the Republic of Kazakhstan for 2030" has been established. Its main purpose is to define strategic priorities for the formation of the national model of entrepreneurial education that would be directed to obtain knowledge and required competencies in entrepreneurship. The working group has held five meetings that were attended by representatives from 47 universities of Kazakhstan.

It is worth-noting that the innovative economy in Kazakhstan is created by the state which is a typical top down approach. In this context, it is necessary to involve universities in economic processes for the development of sustainable innovative economy. Entrepreneurial universities should become part of the "triple helix" of academic-industry-government relations that will play a major role in the country's economic development (Etzkowitz, 2008).

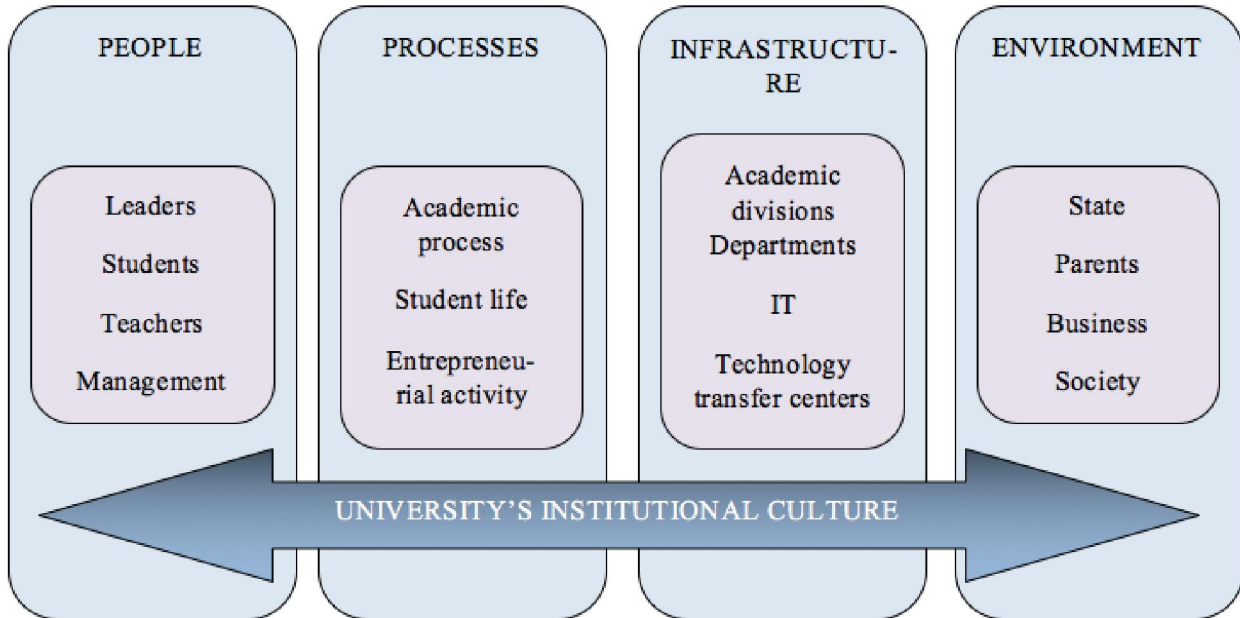
## **Discussion**

Apart from the two main activities – education and research – universities must participate in economic development of a region through training and supporting entrepreneurs, and through creating new businesses. Only having a self-constructed ecosystem, an entrepreneurial university can deliver the "third mission" (Etzkowitz, 1997). Methods of transfer and commercialization of knowledge should be clear and relevant to universities (Venditti et al., 2013). According to Clark (1998), the main features of an entrepreneurial university are absence of fear of new ideas for development, commercialization and promotion of these ideas into the real world.

In this vein, we propose to define an 'entrepreneurial ecosystem' as a "set of interconnected business organizations (companies, venture capital firms, business angels, banks), institutions (universities, financial bodies, government authorities), and business processes, formally and informally united for mediation and management within the local business environment".

Entrepreneurial ecosystem as a structure is an aggregation of interrelated elements, where, in order to be a system, members of a community should synchronise their policies

and actions. The connection between elements should be definable and visualized in order to assure effective functioning of a university in that system. As Figure 2 shows, the entrepreneurial ecosystem of a university may have the following scheme:



**Figure 2: Entrepreneurial University's Ecosystem**

**People**

An entrepreneurial university is a model of private universities that has an inspiring leader who implements initiatives collaboratively with like-minded people. Faculty of an entrepreneurial university must be motivated and encouraged to focus on generating new ideas.

**Processes**

Along with the traditional business activities of a university, entrepreneurship is a special one. Community service is manifestation of a responsible attitude towards society at large.

**Infrastructure**

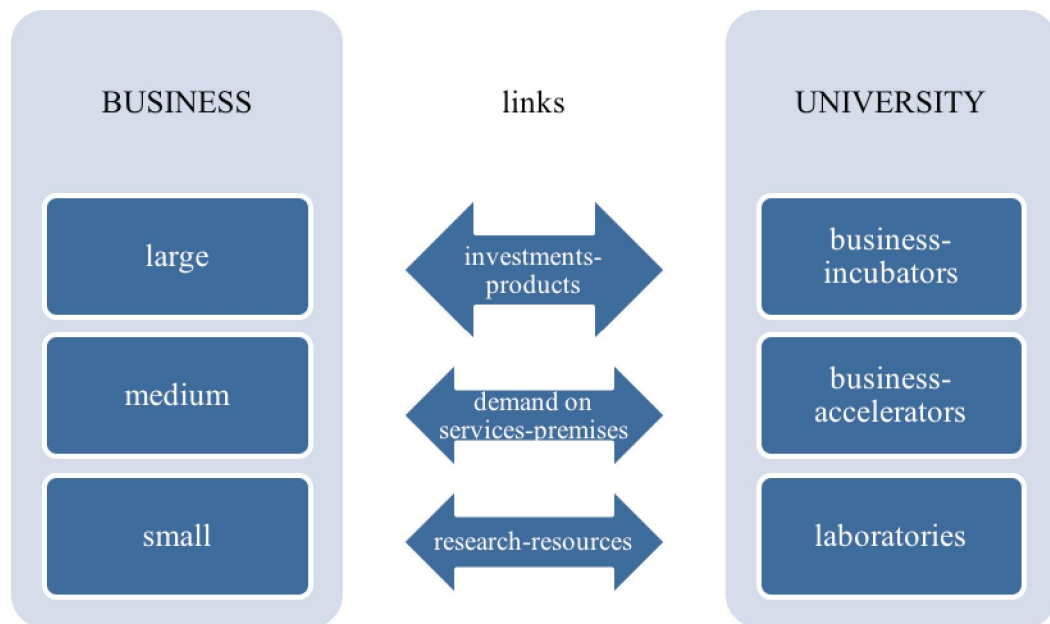
Laboratories and technology transfer centers, consisting of business incubators, business accelerators and co-working spaces, have a special place at entrepreneurial university. Information sphere and related services should be well-developed.

**External environment**

Surrounding environment of an entrepreneurial university will be complemented by such entities as angel investors, venture companies and endowment funds. As noted in the draft of the USAID Report (2013), there is “underestimation of the role of local institutions” in Kazakhstan.



For more productive university-business relationships, we propose the following diagram which explains interaction of the elements of entrepreneurial university's ecosystem (Figure 3).



**Figure 3: Interactions between a university and business**

1. According to the Business Code of the Republic of Kazakhstan (2015) “business incubator is a legal entity created to support small businesses at the stage of their development, by providing premises and equipment; organizational, legal, financial, consulting and information services”.
2. The main function of a business accelerator is to repeat the successful business experience in other companies.
3. Laboratory at a university is usually created for conducting research by students under the guidance of instructors.

Objectives for the creation of structures of an entrepreneurial university allow one to point out the following assumptions.

- Business-incubators will interact with large businesses as with potential investors, which will fund spin-off companies of university faculty.
- Business-accelerators can provide a space for entrepreneurs at the initial stage of their business operations.
- Students, as members of universities’ research laboratories, serve as research resources for small businesses.

### **Institutional culture**

A special institutional culture must be created at an entrepreneurial university and its main purpose will be the formation of a positive attitude of society towards entrepreneurship. Institutional culture of an entrepreneurial university should be an integral part of business cultures of a region and a country. It can serve as a basis for the ecosystem on which all the other elements are based. We believe the following elements of institutional culture are essential for developing an entrepreneurial university.

- *Responsibility* of entrepreneurs for decisions and actions concerning their lives and financial condition (as they have a mature *attitude to risk taking*).
- *Mutual trust* between people and a state (as it creates norms to make a more comfortable environment). Institutional trust would be an important indicator of entrepreneurship development.
- *Attitude to success or failure*. An entrepreneur is often a person who comes to success through series of failures and setbacks. As mentioned by Korkhunen and Olimpiyeva (2012) in their study on the role of individual models of behaviour that affect activity efficaciousness of innovative, high-technology companies, “failures are a natural part of career and life.”

Institutional culture of an entrepreneurial university is expected to be open for changes. Entrepreneurial culture can be developed, if the university has its own special institutional culture. Such culture encourages all members of a community to develop entrepreneurial skills within all the structural elements and subdivisions of a university.

### Conclusion

In order to develop an entrepreneurial ecosystem, universities must create a set of entities such as business incubators and business accelerators that could be managed by both faculty and students. According to Clark (1998), a strengthened steering core, as one of five elements of an entrepreneurial university’s environment should be necessarily open and ready for changes. An entrepreneurial ecosystem of a university cannot be established and effectively function without a certain degree of readiness. The following points of action could be relevant to the higher education sector’s goal to develop entrepreneurial ecosystem of universities.

- Formation of a pool of strong leaders, managers and owner-entrepreneurs.
- Establishment of close ties with the business community and society.
- Comprehensive transformation of the institutional environment by introducing new structural elements, such as business incubators, start-up project teams into it.
- Integration of academic and research units of a university, based on blurring the edges of traditional disciplines and on creation of start-up projects, which should correspond to the modern methods of knowledge creation.
- Creation of entrepreneurial organizational culture at university.
- Improvement of information structure of a university on a regular basis.

It is worth-noting that these complex and hard tasks of transforming established academic institutions into entrepreneurial ones are not possible to be solved and administered by just one university in the region. It requires combined efforts of many universities as a network. Therefore, there is good reason to establish *Association of Entrepreneurial Universities* as a voluntary entity. This association will be likely to promote mutual cooperation and enable higher education leaders to share local and international best practices. The Association will actively participate in the process of technology transfer and in commercialization of intellectual activity results. Also, it will try to achieve effective partnership with governmental bodies and businesses within the frame of the Triple Helix model.

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