

# ENTREPRENEURIAL UNIVERSITIES AND THE DEVELOPMENT MODEL FOR PUBLIC UNIVERSITIES IN VIETNAM

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## ABSTRACT

*This article summarizes and clarifies the theoretical and practical characteristics and elements of entrepreneurial universities. Based on the results of a survey administered to universities and in-depth interviews with administrators and lecturers in management roles at four public universities in North of Vietnam, it proposes an organizational model for developing entrepreneurial universities in the context of public universities in Vietnam and discusses related policy implications.*

**Keywords:** Entrepreneurial Universities, Entrepreneurial Universities Formation, Vietnam Public Universities, Vietnam.

## INTRODUCTION

The objectives and missions of universities have changed dramatically in the last century. Previously, the main tasks of traditional universities were researching, spreading knowledge, and developing highly educated workers. Through the early years of the 21st century, universities have become creative centers where students acquire multidisciplinary knowledge and training and learn to generate new insights. In addition, adapting to the impact of the 4th technological revolution (4.0) and the requirements of socio-economic development, universities also have the third mission of transferring technology to serve the society and promote the commercialization of scientific research products, and the fourth mission of conducting businesses by starting “spin-off” academic enterprises (Boffo & Cocorullo, 2019). To fulfill these missions, universities today have the attributes of the 4th industrial revolution: they are interdisciplinary and characterized by constant studying. In particular, a number of universities have transformed in the direction of innovation-related business initiation, seeking to create new values by cultivating innovation ecosystems, business development, and the commercialization of research results. These universities are referred to as “*entrepreneurial universities*”.

Researches by many academics over the last 20 years reached a near consensus that entrepreneurial universities exhibit certain characteristics regarding their goals, organizational structure and activities. In Vietnam, even though public universities are undergoing drastic transitions to conform to autonomous mechanisms, they only manifest some of the above characteristics, which is consistent with the findings of (Farsi et al., 2012) regarding universities in developing countries.

On the basis of an overview of academic research, this article analyzes and clarifies the organizational structure and resource-related factors involved in forming entrepreneurial universities. The results of a survey administered to 120 universities across the country and an in-depth study of 4 public engineering universities in Northern Vietnam presented in the article are also consistent with the above assessment: as of now, Vietnamese universities do not have the organizational structures and resources to transform into entrepreneurial universities. Based on the identification of the key elements of entrepreneurial universities and the results of the above practical research, this article proposes a development model to begin to transform public universities in Vietnam into entrepreneurial universities. In addition, to address the obstacles and hindrances to innovation start-ups, the article provides policy recommendations for governance reforms public universities in Vietnam can implement to foster institutional environments conducive to university autonomy and the development of innovative ecosystems. These are the external factors that impact the model for entrepreneurial universities in Vietnam.

## THEORETICAL BACKGROUND

### Entrepreneurship Initiation in Universities

Entrepreneurship initiation and business development are widely known to involve a combination of entrepreneurial roles and functions, including the capabilities and desires of individuals within or outside existing organizations to identify and create new business opportunities (new products, new production methods, new business organization projects, or new product-market combinations) and attempt to introduce their ideas to the market (Barringer et al., 2005); (Lumpkin & Dess, 1996). Since the 1990s, the cognitive gap for universities between academia and businesses has narrowed and researchers have observed the emergence of entrepreneurs in academia (Shore & McLauchlan, 2012). This is the premise for entrepreneurs in universities, who carry production and commercialization activities related to scientific research results into the market in a profit-driven manner. This has changed the mindsets of public universities in many countries around the world, including those in Vietnam. If funding for scientific research always used to be government-allocated, it is now considered a source of investment for development; together with government investment, it serves as a means of identifying opportunities for commercialization, community service university revenue increases, and increased income for scientists. These activities clearly represent the entrepreneurship of universities.

According to (Yokoyama, 2006), in the context of universities, entrepreneurship is not necessarily understood as focused on risk-based profit generation and high levels of commercialization; it refers to universities embracing efforts to achieve financial independence and improve their technology transfer capacities and efficiency. An in-depth theoretical study of the universities' activities related to the "*third mission*" by (Shore & McLauchlan, 2012) indicated that the nature and processes of these entrepreneurial activities connect research activities and final commercialization results at the university level. In essence, this involves a

series of activities that encompasses the introduction of innovative research, obtaining patents and technology licenses, business initiation, incubation, and the formation of companies. Currently, academics and regulators agree that the typical activities of entrepreneurship in higher education institutions consist of three main groups: technology transfer, commercialization of intellectual property, and the formation of new enterprises by the universities.

In addition to the activities mentioned above, (Clark, 1998) conceptualized the search for new methods studied by five European research universities that aimed to reduce the heavy reliance on government support as "*business-oriented transition*". Accordingly, renovating the organizational model of executive management in universities in this direction represents entrepreneurship and is an important prerequisite for developing entrepreneurship in universities. In his studies, (Etzkowitz, 2002) also used the term business initiation in universities to describe the transition in governance and enterprise formation from the results of partnerships with private sector and government agencies at the Massachusetts Institute of Technology (MIT).

### Entrepreneurial Universities and their Characteristic Features

Researchers have used multiple theoretical models to explain the phenomenon of universities operating with business orientations or "*entrepreneurial universities*". These researchers include: (Clark, 1998), (Sporn, 2001), (Guerrero-Cano et al., 2006), (Rothaermel et al., 2007), (Gibb et al., 2009), (Guerrero & Urbano, 2012), (Sooreh et al., 2011). Many of these studies including (Clark, 1998), (Etzkowitz, 1998) and (Farsi et al., 2012) have identified the following common features of transformation in these universities: strong implementation of business initiation activities, developing entrepreneurship, and innovation at different levels (country, organization, groups and individuals). These activities play an important role in the tripartite cooperation of the Triple-Helix model: government, universities and businesses to promote technology transfer and enterprise formation (Etzkowitz, 1998), (Rasmussen et al., 2011), (Dalmarco et al., 2018). According to (Röpke, 2000), these universities also help build entrepreneurship capacities among staff and students. Entrepreneurial universities are playing increasingly important roles in the knowledge economy and modern society.

	<b>Traditional universities</b>	<b>Entrepreneurial universities</b>
<b>Goals</b>	Generate knowledge	Generate knowledge Apply and utilize knowledge
<b>Organizational structure</b>	Functional departments; Faculty; Laboratory; Research center; etc.	Functional departments; Faculty; Laboratory; Research center; etc. TTO; Entrepreneurship incubators; Spin-off companies

<b>Activities</b>	Academic activities (Teaching; Announcing research results; Serving the community)	Academic activities
		Commercialization of research results
Source: (Chang et al., 2016)		

Summarizing available theoretical and practical research results, (Chang et al., 2016) concluded that entrepreneurial universities are noticeably different from traditional universities. They determined that entrepreneurial universities are distinguished by the following characteristics: university goals, organizational structure, and activities (Table 1).

In addition to pursuing the primary goal of traditional universities, which is knowledge generation, entrepreneurial universities aim to apply and utilize knowledge. This is an important feature embodied in the declared missions and development strategies of these universities. Currently, the utilization of research results not only involves disseminating and transferring knowledge to serve communities, but also includes fulfilling the tasks to necessary achieve the highest results and efficiency in the commercialization of scientific research results. These activities must aim to meet market demand, bring about economic efficiency, increase revenues for the universities, and increase the incomes of the staff, lecturers, and researchers. In pursuit of these goals, entrepreneurial universities carry out many activities related to business initiation. The ultimate aim of the chain of activities is technology transfer, commercialization, and business development based on research and development.

To fulfill their missions and goals while also carrying out their activities, entrepreneurial universities need to transform their organizational structures, governance mechanisms, and modes of operation (compared to traditional universities) to enhance the utilization of the results of their academic activities. Starting from this assumption regarding the goals of entrepreneurial universities, this article presents the results of research and surveys about organizational structure, the conditions affecting transformation processes, and the results of business initiation activities in entrepreneurial universities.

### **The Organizational Structures of Entrepreneurial Universities**

As (Chang et al., 2016) pointed out, businesses and research centers that are structurally integrated into entrepreneurial universities and designed to cooperate with the industry contribute substantially to the implementation of business initiation activities. Enterprises are often companies formed from ideas, research results, and creativity in universities, typically spin-offs (Farsi et al., 2012). In addition to the specialized units (faculties, subjects) and functional units (departments, boards) inherent to traditional universities, entrepreneurial universities have units such as technology transfer offices (TTO) and incubators.

The above units assist in connecting university scientists with businesses and markets beginning in the initial stages of establishing technology research and development. Meanwhile, enterprises and organizations commercialize and act as bridges between scientists, inventors, markets, and consumers (Boffo & Cocorullo, 2019) characterized the trend of developing

enterprises in universities promoting business and commercialization together with the generally accepted concept of spin-off academic enterprises as follows: “*a new company, founded by individuals who are former employees of a parent organization, and whose core technology is transferred from the parent organization*”. The parent organization here refers to a university. In addition, as intellectual centers associated with innovative research, universities are ideal places to establish *startups* (Dinh, 2017). In practice, companies established in universities often begin as small and medium-sized enterprises to cope with the high risks.

Regarding development trends, the above transformation also applies to the internal management and administrative mechanisms of universities. Accordingly, universities such as the University of Surrey, UK have implemented autonomous mechanisms, market-oriented governance structures, and management structures to integrate enterprise structures and academic business. Ideally, universities will have full autonomy and self-reliance to share risks and responsibilities among parties engaged in business activities in a transparent manner, integrating business, enterprise, and academic cultures into management in cooperative ways that avoid conflict (Yokoyama, 2006). To maintain autonomy in organizational structure and operation, universities need institutional environments that remove barriers to facilitate the active pursuit of resources, and expand investment, joint ventures, cooperation, and business initiation activities. In the current period of model transformation, changes in state governance and institutions regarding higher education management that move toward the promotion of autonomy, academic freedom and innovation are necessary. Therefore, regarding university governance, researchers also consider deregulation a necessary condition for entrepreneurial universities (Mowery et al., 2001).

### **Main Factors for Entrepreneurial University Formation**

Regarding the requisite conditions for becoming an entrepreneurial university, (Chang et al., 2009) suggested that establishing effective mechanisms for integrating scientific research activities with commercialization is always a major challenge for traditional universities. These mechanisms depend on transformations in university governance from strategy to leadership, management, and administration. (Sporn, 2001) also affirmed that in addition to external networks, corporations, and strategic alliances, internal factors such as vision, goals, organizational structure, management, governance, leadership, and culture are essential for entrepreneurial universities. (Etzkowitz, 2003) regarded close relationships with industries and government, independence from institutions, and suitable forms of knowledge capitalization and innovation as the most critical attributes of entrepreneurial universities.

Following the “*input-process-output-outcome*” approach to defining entrepreneurial universities, (Sooreh et al., 2011) pointed out that an entrepreneurial university can be considered a systematic and dynamic organization that includes many factors. Accordingly, the important factors include resources (including entrepreneurial human resources with researchers that can effectively meet market demands; creativity and innovation, entrepreneurship network), mission and regulations, processes, and organizational structure (within which business initiation centers

are considered outputs). Defining missions and developing regulations and management processes are always associated with building university development and governance strategies. Therefore, the factors in the second group highlight the importance of approaches to university management that align with defined strategies to transform universities into entrepreneurial universities.

The above results are also consistent with the overview of conditions for entrepreneurial universities that (Clark, 1998) presented-effective leadership systems, expanded external cooperation, diverse funding sources, the encouragement of entrepreneurship and an entrepreneurial culture, and integration into academia. In this respect, according to Clark, entrepreneurship cultures should be developed at the individual, group, university, and national levels.

The above research results indicate that in addition to external environmental conditions, appropriate development strategies, and organizational structures, the essential factors in the development of entrepreneurial universities also include entrepreneurship and the resources and elements of university governance (fundamentally, these are also essential to business development in universities). These factors can also be considered the requisite internal conditions for a university to become an entrepreneurial university.

## **Entrepreneurship**

To carry out its mission, a key factor for an entrepreneurial university is the will to start a business-or "*entrepreneurship*" in the organization in general-within the university, its management board, and its lecturers. If business aspiration is a key attribute of entrepreneurs, entrepreneurship is the "*soul*" of innovative entrepreneur-oriented organizations like universities. This aspiration is formed and developed in universities and becomes the most important factor for in transforming universities into entrepreneurial universities.

Entrepreneurship in the university is not only reflected in the business aspirations of its members. Indeed, in the context of increasingly closer connections with markets and businesses, many studies have shown that the "*enterprise*" mindset and "*enterprise*" management style play an important role in university management and administration. In short, management mindset and methods, governance, and leadership are also expressions of entrepreneurship and therefore positively influence the development process of entrepreneurial universities.

## **Resources**

According to (Guerrero-Cano et al., 2006), entrepreneurial universities use their resources to help achieve competitive advantages over other universities; these resources can be divided into soft resources and hard resources. Soft resources include human resources related to entrepreneurship aspirations and motivations, education and scientific research, dynamic mechanisms, reputation, and entrepreneurial platforms. Hard resources refer mainly to financial resources (from the government and the private sector for innovation and transformation),

infrastructure, material resources, and technical resources. The resources of entrepreneurial universities are combinations of the above. Practical research by (Farsi et al., 2012) at Tehran University, Iran has highlighted the need for a balance between these two types of resources, but the authors have always emphasized the role of soft resources in interviews. Results of the research on resources for entrepreneurial universities using the "input-process-output-outcome" model approach of (Sooreh et al., 2011) also highlight the factor of entrepreneurial human resources associated with innovation. As such, the soft resources of entrepreneurial universities are always integrated with appropriate organizational structures and entrepreneurship towards the goal of utilizing all resources and capabilities to initiate business in universities.

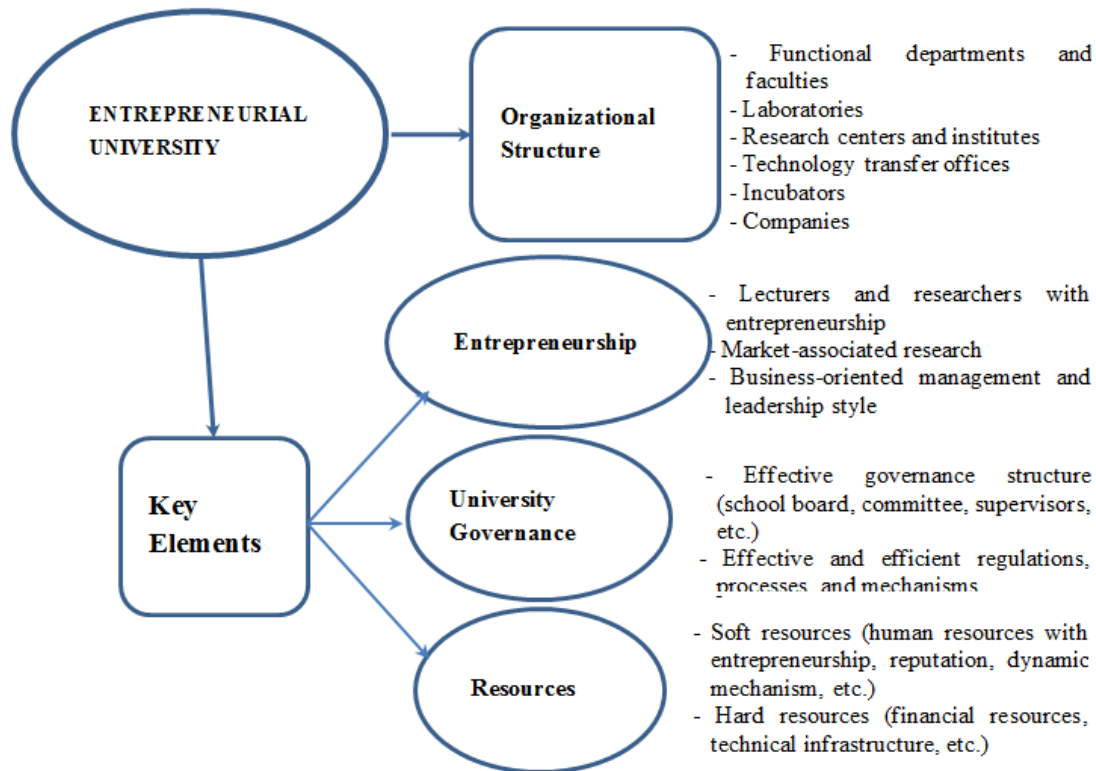
### **University Governance**

Together with the establishment of institutions in external ecosystems, business-oriented leadership and management are also important characteristics of entrepreneurial universities. The studies of (Sooreh et al., 2011), (Röpke, 2000) pointed out three main criteria. Entrepreneurial universities need governance structures and systems (collectively referred to as university administration) that are based on business management styles with members who possess entrepreneurial attitudes and are capable of applying entrepreneurial mindsets in their interactions with the environment. To that end, (Etzkowitz, 2003) claimed that university administrators need appropriate state governance conditions to be independent from institutions and retain the organizational mechanisms necessary to support the entrepreneurship development associated with innovation.

## **IDENTIFYING THE FEATURES AND ELEMENTS OF ENTREPRENEURIAL UNIVERSITIES IN VIETNAM**

### **Research Models and Methods**

Based on the characteristics, organizational structures, and key formation-related elements identified above, this study applied the entrepreneurial university model shown in Figure 1 to research with universities in Vietnam.



**FIGURE 1**  
**ORGANIZATIONAL STRUCTURE AND KEY ELEMENTS OF ENTREPRENEURIAL UNIVERSITIES**

To fulfill their missions, entrepreneurial universities cannot ignore patents for inventions, the establishment of spin-off companies, and the creation of offices to execute public technology transfer contracts (Farsi et al., 2012). This aligns with the conclusion of (Chang et al., 2016) and the proposed model in which entrepreneurial universities must have organizational structures that include technology transfer offices, incubators, and companies (besides laboratories, institutes and research centers) as shown in Figure 1.

The results of a questionnaire survey sent to 120 universities throughout the country were analyzed and synthesized to clarify the status and results of enterprise development. In addition, secondary data based on reports and statistics were combined with semi-structured in-depth interviews with lecturers with management roles (18 people) currently working at 4 universities: Hanoi University of Science and Technology, the National University of Civil Engineering, Thuy Loi University, and the University of Mining and Geology. These are large public universities with over 50 years of development, high research potential, and valuable technology development research results-leaders in the Northern region of Vietnam. The interviewees were



lecturers or researchers with management roles as leaders of faculties or institutes or above with more than 10 years of working experience at the university level. A total of 10 participants were leaders of universities and faculties, 5 were leaders of scientific research institutes and centers, and 3 were leaders of university-owned enterprises.

## **RESULTS**

### **General Survey of Enterprise Development in Universities**

The survey responses totaled 43 (including 37 from public universities and 06 from non-public universities). The results are as follows: out of 11 companies that have been established at 11 universities, 9 are limited liability companies and only 2 are joint stock companies; out of the 32 universities that have yet to establish enterprises, only 16 have plans to establish one.

More notably, only 1 of the 11 universities that have established enterprises is a non-public school, and of the 16 universities planning to establish enterprises, 100% are public universities. This reflects the fact that non-public universities in Vietnam are mainly founded by private enterprises and entrepreneurs seeking to invest in human resource development and that most of them only pay attention to enrollment issues while ignoring business development within universities. The survey results also show that (according to statistics officially published by universities) neither the staff nor the lecturers nor the students at these institutions have established spin-off or start-up companies.

### **Research Results from 4 Public Universities**

The results of the practical surveys on entrepreneurship activities at 4 public universities in the North including: Hanoi University of Science and Technology, the National University of Civil Engineering, Thuy Loi University, the University of Mining and Geology show that in the past two decades, public universities and universities in general have engaged in activities such as establishing enterprises, centers, and institutes to promote the transfer, commercialization, and provision of services. In addition, the universities have also sought to promote entrepreneurship by renovating management and administration, strengthening decentralization, and enabling university departments to exercise autonomy and accountability.

### **Organizational Structure**

The establishment of companies was quite common in the 2000–2008 period because the policy of the Prime Minister facilitated pilot establishment; however, the number remained very limited (as explained above) and all operated as limited liability companies. The companies were all transformed from state-owned enterprises and originated from the universities' research institutes or training departments. Currently, the companies operate as science and technology enterprises established by the universities in accordance with specific government regulations. The results of surveys administered to these four universities show that neither staff nor lecturers

nor research groups nor students established spin-off companies or startups during the 2008–2018 period.

Out of the 4 surveyed universities, only Hanoi University of Science and Technology formed a technology incubator and provided enterprise establishment support. The incubator and these activities are carried out at BK Holdings Company and business groups oversee BK Holdings. Besides education (BK Holdings Educations), the technology commercialization model of BK Holdings has proved very successful thanks to three main groups: BK Holdings Technology, which includes 5 companies; a service group that provides transfer assistance (TTO); and enterprises incubation (BK Holdings Incubator) that provides many start-up projects commercialization and enterprise deployment support. These activities have enabled BK Holdings to establish revenue-generating services and projects.

In in-depth interviews, school leaders and managers all expressed the desire to increase revenue from university-based business enterprises and the expectation that they would do so, especially when these enterprises are autonomous. Although many technologies and solutions have been applied in practice through external enterprises with official (through individual creators) or unofficial transfers, published data and official university reports do not mention business development activities related to the two above methods.

Meanwhile, the establishment of research centers and institutes is very common in the technical universities examined in this study. While the 4 studied universities have established only 4 limited liability companies, they have founded 26 centers and 29 institutes. These units are established and operate under the model of revenue-generating public service delivery units. Most of them are dependent accounting units under the universities, though the units established after 2010 are all financially autonomous units.

### **Key Elements for Entrepreneurial Universities**

In terms of entrepreneurship, a drastic change has occurred in the perceptions of leaders and teaching staff when it comes to increasing applied research, serving communities, and transferring technology to increase revenue for units and universities. All interviewed staffs affirmed: lecturers and researchers all desire to transfer the developed technology if there is an applicable address, desire and determined in commercializing their research results as long as there is a reasonable mechanisms for benefits sharing. However, the general perception is that lecturers do not pay much attention to the establishment of enterprises stemming from the results of their research activities and especially the establishment and management of enterprises by themselves (spin-off companies). Instead, most of the lecturers and scientists who have produced highly commercializable products from research results have “*backyard*” businesses to bring products to market, sometimes without the need to pay license transfer fees.

Regarding university governance, the results of the interviews with experts and administrators all indicate that there have been no clear transformations in governance institutions that aim to satisfy stakeholders, including investors and enterprises, and promote innovative startups. The top priority of the universities is still to meet the criteria and

requirements of each year's plan assigned by the governing body and the Ministry of Education and Training; they are not focused on promoting the roles of faculties, subjects, and scientists within the universities. Departments in these universities mainly carry out the teaching plans for students in classes based on their assignments without being proactive and dynamic in social relations or applying their knowledge and technology resources in the market. In addition, the autonomy and social responsibility of these public universities are not emphasized. The universities have evidently not been given autonomy when it comes to finance and personnel management.

In terms of resources, all of the 4 researched universities possess the materials and technical facility resources required for entrepreneurial activities. However, the financial resources and mechanisms for using public infrastructure, land, and assets are always an issue due to the absence of clear guidelines. For soft resources, the influence of governance mechanisms in universities and companies, especially centers and institutes directly under university control, has generated encouraging results for the development of entrepreneurship. The change is noticeable in two ways: more autonomy in management, administration, and decision making; and, as “*enterprises*” operate in the field of science and technology, there have been efforts to mobilize resources, capital, and assets from organizations and individuals, sending competent staff to join agencies in corporate governance institutions. In particular, as units directly under public universities, enterprises, centers, and institutes are entitled to incentives in their science and technology activities (corporate income tax exemption, land tax exemption, etc.), the comprehensive endorsement of their legal statuses (as public service delivery units), and priority in utilizing universities’ brands, especially for scientists taking on management roles.

### **Causes of Limitations in Developing Organizational Structures of Entrepreneurial Universities**

In-depth interviews with the leaders of four universities clearly show that the universities are dependent on parent ministries (the Ministry of Education and Training and the Ministry of Agriculture and Rural Development) when it comes to managing personnel at the university management level, resources, and organizational structures. The establishment of units with new roles and personnel requires complex proposals and procedures. Meanwhile, the universities do not have the grounds for strong proposals highlighting the urgency of establishing new units such as transfer offices and business incubators. In the coming years, as the demand for technology transfer and business development increases as a result of the research results of laboratories, centers, and research institutes, universities will need to develop plans to promote the formation of these units. At present, the parent ministries restrict the establishment of new units, unless they are financially self-sufficient and do not rely on university funding.

Through discussions and thorough investigation regarding the lack of spin-off companies and start-ups, this study shows that lecturers who have office positions want to maintain stability and do not want to leave their office positions. The actual data on university human resources

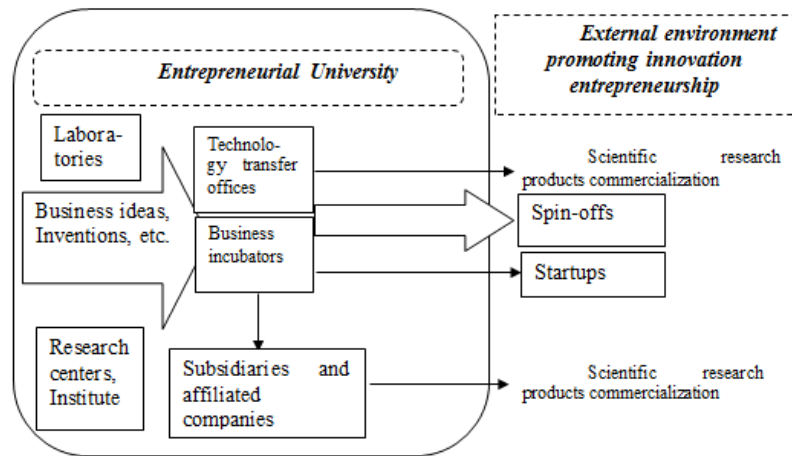
also shows that lecturers who have done substantial research and have high academic capacities have mostly worked in the universities for 10-20 years. Meanwhile, young lecturers who are ready to leave office positions are not ready for business management and do not yet have commercially viable transfer technologies. In addition, the current regulations of Vietnam do not allow such lecturers to participate in the management of these companies while working in universities (the positions they do not want to leave).

In addition, the experiences of different countries show that the purely academic ideas and inventions of lecturers in universities (centers, research institutes) are necessary but not sufficient to establish these enterprises. To qualify for trial production and testing in the market, these ideas or technology products need to be nurtured and provided legal and resource support. Only when these products are created and have the potential to be commercialized can they attract investors into production. This is the “*sufficient condition*” to form companies and for companies to attract investments. Survey results from the 4 universities above showed that commercializable ideas and technologies have not received sufficient and prompt supports to be fully matured for commercialization. This is due to the fact that most researches are only conducted in order to fulfill the requirements to receive government’s research grants.

### **Entrepreneurial University Development Model and Policy Recommendations for Vietnam**

Over the past 20 years, many universities have transitioned to become “*innovative entrepreneurial*” universities whose most essential characteristics include association with entrepreneurship, linking all activities to improvement and innovation to meet stakeholder requirements, and exercising autonomy and self-responsibility toward society. In the era of 4.0 university education, universities have connections resembling networks with each other and with society. In particular, organizational models have transformed: universities have diversified their operations and internal and external connections, becoming innovative entrepreneurial university ecosystems that promote the commercialization of scientific products.

Utilizing a theoretical framework and practical survey and research results, this article proposes a model for entrepreneurial university development designed specifically to transform public universities in Vietnam. Based on this model, the development of entrepreneurial universities is predicated on the existence of environments that promote innovation, commercialization, and business development activities and thereby create ecosystems that support their formation and development (Figure 2).



**FIGURE 2**  
**ENTREPRENEURIAL UNIVERSITY DEVELOPMENT MODEL**

In this model, universities need research capacities, laboratories, and research institutes/centers to generate business ideas, new technologies, and useful inventions and solutions. To commercialize scientific research products, universities need to establish technology transfer offices and business incubators. The effective operation of these units will promote technology transfer and the commercialization of the research results of scientists and universities to outside enterprises (Dinh et al., 2016), and at the same time promote the formation of new spin-off companies, startups or subsidiaries, and affiliate companies located in the universities.

In particular, removing the above-mentioned “*dilemma*” between business formation and the development of new units requires the synchronous establishment of offices of technology transfer (“*OTT*”) and incubators in university structures together with the promotion of commercializable research in research units (laboratories, centers, institutes). This helps create resonance: the support units assist the university and lecturers in establishing companies; in turn, companies, when formed, call for investment capital to generate funding and promote the operation of these units. Meanwhile, the cooperation activities of these companies with individuals and organizations in the university will impact the intentions and desires of lecturers and researchers to form businesses and increase the need for OTT and incubators within the organizational structures of the universities.

In terms of policy for entrepreneurial university development, to be autonomous in their organizational structures and internal management systems, public universities in Vietnam need legal frameworks that remove management barriers. In addition to promoting the autonomy, accountability, and responsibility of universities, it is necessary to eliminate the mechanism of governing bodies and ministries for universities. Naturally, this will increase the financial pressure on universities to streamline their activities and to bolster their business activities with

non-state budget revenues and revenues from tuition. This will further promote the shift in organizational structure towards entrepreneurial universities as described above.

Entrepreneurial and business development activities in universities are always associated with innovation (Dinh, 2017). Therefore, in addition to developing entrepreneurial elements, public universities today also need an environment that encourages and promotes innovation-also known as an innovative entrepreneurship ecosystem. To this end, the government needs to urgently develop a legal and policy framework to improve this ecosystem. Universities require improvements in the market, policies, and mechanisms related to science and technology activities and in the real estate law to remove obstacles for business initiation activities (Dinh, 2017). In particular, the government should abolish regulations prohibiting public servants and employees from participating in the management of private enterprises (at least for officials in public universities) in relevant laws such as the Law on Cadres and Civil Servants, the Anti-corruption Law, etc. This would free university officials and lecturers to set up and participate in managing companies derived from their research products or their own start-up companies.

## CONCLUSION

The entrepreneurial university development model has become increasingly popular for research-oriented universities around the world. This model requires a particular organizational structure as well as other essential factors. In terms of structure, in addition to strategic goals oriented toward knowledge application and the components of a traditional university, entrepreneurial universities need research units, technology transfer supporting units, business development units, and companies developed based on the results of scientific research and innovation activities (typically spin-offs and start-ups). Among the necessary conditions for transforming traditional universities into entrepreneurial universities, the main factors identified in the paper are entrepreneurship, resources, and university governance.

In Vietnam, the research results show that most of the universities that have established or will establish enterprises are public universities; these enterprises follow the model of enterprises under university control and are styled as state enterprises. Official figures for spin-off and start-up companies from universities are not available. Out of the 4 studied universities, only Hanoi University of Technology has a start-up incubator (within BK Holding Company) and start-up support activities. Therefore, in addition to internal factors, transforming traditional universities into entrepreneurial universities requires support and the removal of obstacles via organizational reform, management innovation, and exercising autonomy at the university level. Along with the proposed entrepreneurial university model, this article also emphasizes the need for an external environment that promotes innovation. To create such an environment, Vietnam needs to improve and synchronize its legal and institutional systems to establish a start-up ecosystem. However, one of the most pressing issues currently is to “free” scientists and lecturers who are now public officials in public universities to exercise academic freedom in universities and participate in establishing and managing companies associated with the results of scientific research and transferred technology.

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