

## Study on Spin-off Business Model for the Exploitation of Intellectual Property at University in Vietnam

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### Abstract

Promote the application of scientific research and technological development results to production and social life; The commercialization of scientific and technological products through the science and technology market is an effective method to exploit intellectual property at universities and research institutes. Spin-off is a popular business model in developed countries to deploy and commercialize scientific and technological research results. However, in Vietnam, this concept is not popular as well as the number of spin-off businesses is not much and does not work effectively. This article focuses on clarifying the shortcomings and difficulties in establishing spin-off businesses in universities, thereby proposing solutions to develop spin-off businesses to exploit assets intellect at universities in Vietnam

**Keywords:** Spin-off, science and technology enterprises, ecosystems, technology transfer.

### 1. Introduction

Through scientific research and technological development activities, universities and research institutes will form certain research products. One of the outputs of scientific research is that new technologies can be applied in life, bringing economic benefits to both society as well as researchers themselves. Some of these products are likely to be patented, but many of them require further research and development before commercialization. By granting universities and research institutes intellectual property (IP) rights and allowing them to be commercialized, governments around the world are trying to accelerate the transformation of their intellectual property into production processes and industrial products, strengthening cooperation between universities - research institutes and businesses.

Currently, Vietnam has about 237 universities, 16,500 doctorates, 574 professors and 4,113 associate professors. Annually training about 1,500 doctorates, 36,000 masters, nearly 1.5 million university students and several thousand scientific research projects at all levels deployed from universities [1]. According to the statistics of the Intellectual Property Office of Vietnam [2], Ministry of Science and Technology, in the period

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Manuscript Received: January. 25, 2022 / Revised: February. 3, 2022 / Accepted: February. 7, 2022

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from 2010 to 2020, the average number of Vietnamese universities and research institutes patent registration gradually increase from 25 in 2010 to 160 in 2020 (figure 1.a) and the number of utility solutions filed also increase from 28 in 2010 to 62 in 2020 (figure 1.b).

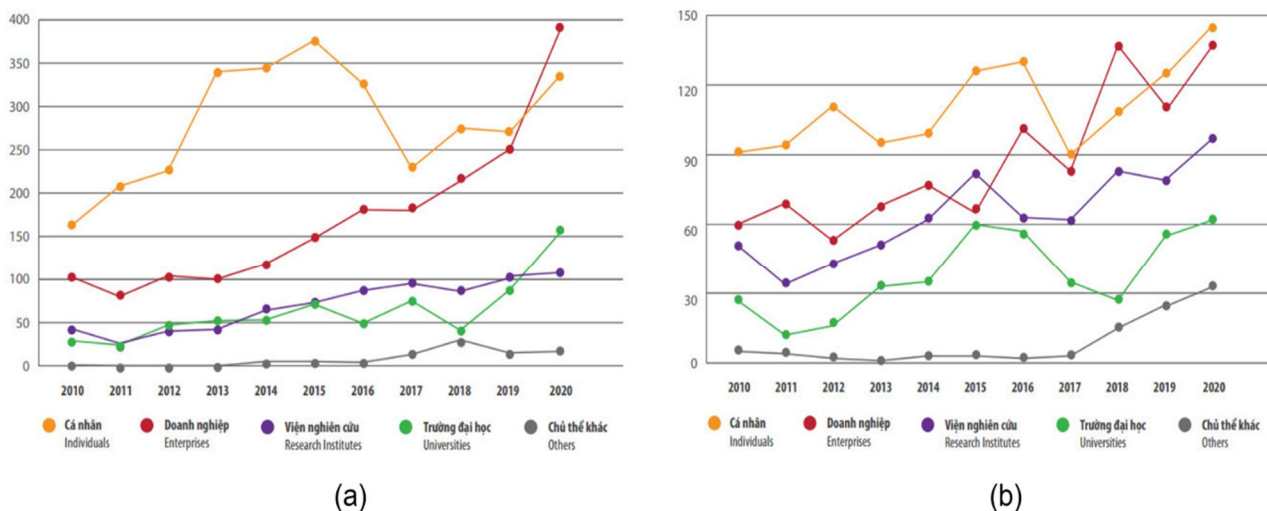


Figure 1. (a) Vietnamese invention applications and (b) utility solution applications by holder from 2010 to 2020 (source: Intellectual Property Office of Vietnam)

The above data and analysis show that, although universities and research institutes are an extremely rich and potential source of intellectual property, scientific research results show that this "resource" has not yet given results commensurate with the available intellectual human resources. Therefore, it can be affirmed that the research activities of universities are not highly effective as well as technology transfer activities commercialization of scientific research findings from universities to enterprises are weak, ineffective and very limited compared to the abundant potential of universities and institute.

In order to implement the research results, the establishment of technology businesses to commercialize these results is indispensable. Technology transfer to technology corporations is a form of permission to conduct research, but this often requires the researcher's "sale" of intellectual property. Establishing start-ups owned by scientists with their own research institutions is a way to both allow the commercialization of technology and allow scientists to gain long-term benefits from owning assets, their intelligence, and also the research agency itself thus reaps economic benefits. This is the model of spin-off companies (university spin-off companies or technology spin-off companies), which is very popular in developed countries.

Spin-off and start-up are two start-up models that are of interest today. While start-ups are quite popular and thriving, spin-offs have not been interested and popular in Vietnam. The concept of "university spin-off company" or "academic spin-off company" is not very common in Vietnam, but very popular in developed countries, especially in countries with developed science [3]. Spin-off models and start-ups were first formed in developed industrial countries. Spin-offs originated from universities (separated from independent activities from universities), by individuals creating scientific and technological intellectual properties involved in the management process of enterprises. In addition, University Spin-off companies are main actors in the entrepreneurial university ecosystem and strengthen knowledge transfer, by relating with other businesses beyond this ecosystem and expands the emergent ecosystem approach into the field of entrepreneurship [4]

Start-ups refer to the start-up of a newly formed enterprise on the basis of scientific and technological results

[5]. The research results for spin-off formation are usually the results of high-tech and new technology research. Table 1 shows the difference between spin-off and start-up business models.

**Table 1. Comparison between Spin-off and Start-up businesses**

	<b>Spin-off</b>	<b>Start-up</b>
Founder by	Universities, research facilities, ...	Universities, research facilities, ...
Technology	Owned by a university or research facility	Buying a technology transfer license
Investment capital, infrastructure	Universities and research facilities	Outside universities and research facilities
Management	Researchers of universities, research institutions	Staffing outside universities and research facilities

Because the characteristics are always associated with research institutions and universities, the spin-off business model is often known as "academic spin-off" or "university spin-off". Such a call also makes spin-offs more accessible, while helping research institutions make a clearer choice. Moreover, when research institutions, universities and scientists own patents on technology that want to build and develop their own businesses ("start their own businesses") to trade commercializing scientific research outcomes then choosing a "spin-off" enterprise model is reasonable choice [6].

In the other hand, according to Pirnay and colleagues [7], spin-off is a very general concept, without a clear definition to give a unified understanding. Based on understanding different points of view, it is possible to summarize the concept of spin-off as follows: A spin-off enterprise is an enterprise operating in the field of science and technology, formed on the basis of apply and exploit scientific and technological research results generated at research establishments, universities or by individuals or collectives of scientists, engineers... who possess knowledge and capacity. Highly specialized, entrepreneurial spirit leaves the parent organization to start a new independent business [8].

In Vietnam, the number of startups is increasing while the investment funding for startups is also fast growing as well. To date, Vietnam has been home to about 3,800 startups and Vietnamese startups attracted investments of over \$1.3 billion in 2021, four times the previous year's figure, according to the National Agency for Technology Entrepreneurship and Commercialization Development [9]. Recently, many solutions to promote startups have been studied [10, 11] while solutions to promote spin-off businesses have not been paid much attention and researched. This paper will focus on analyzing the current status of spin-off model in Vietnam as same as being able to propose a number of solutions to promote the development of spin-off business model at university in Vietnam.

## **2. Features and process of forming spin-off businesses**

Spin-off is an enterprise with small and medium-sized start-up with a small amount of investment capital (of course depending on specific fields) and easily adapt to market changes. A number of studies have shown that the characteristics of this business model are primarily expressed in association with intellectual property ownership units (research institutions, universities). Accordingly, these businesses are formed from research institutions (institutes, schools) and have not really separated from the parent organization to operate independently and autonomously as the nature of this model. According to author Vu Thuy Lien [12], the founder of spin-off business also often has the following characteristics:

- Own a specific technology know-how and can apply that technology to product innovation or process innovation.

- Entrepreneurial spirit: interested in maximizing the exploitation of specific technology know-how to produce specific products and services that are sufficiently competitive in the market on the basis of exploiting self-capital. with or from outside capital (borrowed capital, venture capital ...).

According to Ndonzuan, Pirnay and Surlemont [13], the process of forming a spin-off business consists of four stages:

- + Stage 1: to generate business ideas from research;
- + Stage 2: to finalize new venture projects out of ideas;
- + Stage 3: to launch spin-off firms from projects;
- + Stage 4: to strengthen the creation of economic value by spin-off firms

### **3. Difficulties of developing spin-off business model**

#### **3.1 Legal corridor**

On March 27th 1998, The Prime Minister of Vietnam signed Decision No. 68/1998/QD-TTg the experimental establishment of state enterprises in training as well as research institutions, scientific research establishments and many enterprises was established from institutes and schools. However, these businesses are enterprises that carry out scientific and technological activities rather than spin-off business models as in the world. Therefore, the subsequent spin-offs did not work as well as the nature of this model due to many obstacles, but first of all, the lack of a regulatory framework. So far, there is almost no law that directly regulates spin-offs, but only related regulations [14].

According to Government Decree No. 70/2018/ND-CP stipulating the management and use of assets formed through the implementation of science and technology tasks using state capital [15], the higher the level of support from the state budget, the larger the corresponding profit to be paid to the State. Such regulation does not create motivation for the host organization being enterprises, research units and scientists in the implementation of scientific and technological tasks. In fact, the process of commercializing research results and intellectual property requires a very large and high-risk investment. If the request is to be refunded to the State according to the proportion of funds contributed to the production of such results, it will not encourage investors and enterprises to participate in the commercialization process.

#### **3.2 Financial resources**

Start-up spin-off businesses really need capital for all their operations, so they need other investments, maybe from their own personal money, or calling for other investors. However, the fact that universities occupy a large (even dominant) ownership will reduce the attractiveness of businesses to outside investors who actually "pour gasoline" on the spin-off machine can run. In addition, the large shareholding means that the university has a strong ability to dominate spin-off activities, while the quality of corporate governance personnel is certainly not a university strength. Therefore, the reality of deploying in the world shows that the success rate of spin-off will be reduced the greater the university's ownership ratio. In addition to the lack of investment resources, the lack of a start-up mechanism to balance the economic benefits of scientists and regulators is also a cause for the difficulty of establishing spin-off businesses.

#### **3.3 Market**

In essence, spin-off businesses focus primarily on new technology, with the market may not have formed clearly, while the immediate knowledge of corporate governance is extremely difficult from capital,

administration, production operations, distribution of products and after-sales services, and not to mention the fierce competition from the market. Typically, spin-off founders often have strengths in the field of science and technology research, while knowledge of business, market and corporate governance is not really their strength.

## **4. Solutions for developing spin-off business model at universities in Vietnam**

### **4.1 Creating a legal corridor**

First of all, it is necessary to clarify the concept of spin-off in legal documents. The current legal documents only refer to science and technology enterprises or high-tech enterprises, while spin-off is a very specific model and has not been uniformly understood. The incorporation of this concept into legal documents is an important prerequisite for building and applying this model properly and effectively. Moreover, it is necessary to specify procedures and conditions for establishing spin-offs, specific legal issues regarding owners, managers, and the relationship between spin-offs and parent establishments, principles activities, supporting policies and incentives for enterprises, especially the role and position of scientists to establish enterprises as well as investment direction for scientific and technological research results.

Beside, it is also necessary to study and propose the application of the sandbox model as a pilot mechanism for the development of science and technology enterprises at research institutes and universities under the spin-off business model. Sandbox is a pilot institutional framework, allowing a small number of businesses to test new technologies and new business models in a practical environment but with a defined scope and time, under the supervision of managers. appropriate risk management and contingency plans to prevent the consequences of failure without having a major impact on the national financial system [16].

### **4.2 Protection mechanism for intellectual property**

The legal system for protecting intellectual property rights needs to be tight to help researchers protect their intellectual property. Regulations on the protection of intellectual property rights should also be considered and improved, ensuring maximum protection for research results of scientists, giving scientists peace of mind in research and application into real life, the most effective is to commercialize research results through spin-off business model.

### **4.3. Mechanism of capital mobilization**

First of all, it is necessary to reduce the ownership rate of the university so that spin-off businesses become more attractive to investors, as well as create more motivation for entrepreneurship. Moreover, start-up funds, science and technology development funds from the government directly to research institutions for spin-off purposes, along with a clear, rigorous regulatory system on the rights of all parties (researchers, ownership agencies, ...), and open mechanism, compact administrative procedures. In addition, it is necessary to mobilize additional external financial resources to invest and support the development of spin-off businesses.

### **4.4 Developing spin-off enterprise ecosystem**

The spin-off enterprise ecosystem is proposed as shown in Figure 2. For the spin-off enterprise to grow, the components in the spin-off enterprise ecosystem must be aligned to strongly support the spin-off enterprise. In particular, universities and research institutes provide the initial infrastructure, capital and human resources for spin-off businesses. Next, the State needs to promulgate specific legal policies and mechanisms for spin-off enterprises. In addition, mobilizing external resources such as financial investment funds, support organizations to provide financial resources, business knowledge, and markets are an important component in

the spin-off enterprise ecosystem.



**Figure 2. Spin-off enterprise ecosystem model**

## 5. Conclusion

In order to implement the research results, the establishment of technology businesses to commercialize these results is indispensable. Establishing startups that are jointly owned by scientists and research institutions is a spin-off company or a technology spin-off company, which is very popular in developed countries. However, as analyzed above, it is difficult to have a standard spin-off model that can be applied to all universities and research institutions in Vietnam, when resources and support mechanisms are still inadequate. Practice shows that the spin-off model is actually one of the best ways to prove the efficiency of the exploitation of intellectual property from training institutions and research facilities.

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