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## Science Transfer Adhering to the Science-Technology Business Model in Vietnam National University, Hanoi: Reality and Prospects

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### **Abstract:**

*Science and technology transfer in Vietnam is currently divided into three types, including domestic science and technology transfer, science and technology transfer through foreign investment projects, and technology transfer through importing machinery and equipment. In which, domestic science and technology transfer mainly takes place among institutes, universities and research institutions for enterprises. However, this transition is yet to achieve the desired speed, and at the same time, it is local and narrow in scope. In Vietnam's universities, technology transfer activities are mostly acknowledged through the science and technology enterprise model. The following article focuses on presenting science and technology transfer activities through the science and technology business model in Vietnam National University, Hanoi. In addition to the introduction, literature review, as well as the presentation of research methods, the article highlights the clarification of the status of science and technology transfer activities, along with bringing about several practical assessments and recommendations in the near future.*

**Keywords:** Science and technology transfer, Science and technology business model, Vietnam National University Hanoi

### **1. Introduction**

Vietnam National University, Hanoi (VNU) is a high-quality training center for scientific research and multi-field, multi-disciplinary knowledge and technology transfer. Its quality is at the regional level, gradually reaching international level and meets the development requirements of the country, in line with the development pattern of advanced higher education. Vietnam National University, Hanoi was established under Decree No. 97/CP dated December 10, 1993, of the Prime Minister via the rearrangement from three big universities, namely University of Hanoi, Hanoi University of Education I and Hanoi University of Foreign Language Education. As of 2021, the organizational structure of Vietnam National University, Hanoi includes 52 focal units, in which are many affiliated units:

Firstly, there are 4 units performing special tasks: Asia Research Center; North West Program Office; Office of National Affairs Mission; Office of Cooperation between Vietnam National University, Hanoi and University of Arizona.

Secondly, there are 10 offices and functional departments belonging to Vietnam National University, Hanoi, including Office of the President; Academic Affairs Department; Organization-Personnel Department; Science and Technology Department; Planning - Finance Department; Cooperation and Development Department; Construction Department; Inspection and Legislation Department; Political-Students Affairs Department; Party Executive Committee and the Trade Union.

Thirdly, there are 8 universities under the Vietnam National University, Hanoi, including University of Sciences; University of Social Sciences and Humanities; University of Language and International Studies; University of Engineering and Technology; University of Economics & Business; University of Education; Vietnam-Japan University; University of Medicine and Pharmacy.

Fourthly, there are 7 scientific research institutes, including Information Technology Institute; Institute of Vietnamese Studies and Development Science; Institute of Microbiology and Biotechnology; Tran Nhan Tong Institute; Central Institute for Natural Resources and Environmental Studies; International Francophone Institute; Institute for Education Quality Assurance.

Fifthly, there are 6 faculties and training centers, including School of Law; School of Business and Management; Faculty of International Affairs; School of Interdisciplinary Sciences; Physical Education and Sports Center; Military and Security Training Center.

Sixthly, there are 13 support and service units, including Center for Student Services; Library and Information Center; Human Resource Development Center; Center for Enabling Startups and Knowledge Transfer; Center for VNU Development at Hoa Lac Campus; Center for Education Accreditation; Center For Educational Testing; VNU Publishing

House; Project Management and Development Unit; VNU Hospital; VNU Journal of Science; VJU Project Management Department; Project Management Unit for Construction Investment of VNU in Hoa Lac.

Seventhly, there are 4 units operating independently, including VNU Science and Technology Development Fund; VNU Development Fund; VNU Scientist Links; Alumni VNU.

As an educational institution with a leading strategic position in Vietnam, over the past time, in addition to the achievements achieved in training pupils, students, trainees, and PhD students, Vietnam National University, Hanoi also actively focuses human and material resources on scientific research and technology transfer activities. Among many selected models and methods, the science and technology business in the university is the path that has been and will bring resourceful efficiency in scientific research and technology transfer activities at the Vietnam National University, Hanoi.

## 2. Literature Review

Research on start-ups in general and science and technology enterprises in universities particularly is not a new research direction in the world, and in Vietnam, this is a topic that has been and is being given interest. Pioneering collegiate spin-off world case studies emerged in the early 1980s, and then continued to expand to a variety of content and countries (Etzcowitz, 1983; Wasser, 1990; Clark, 1998). Initially, entrepreneurship in universities had to actively seek opportunities to commercialize innovative ideas and create economic value in society without harming academic and scientific values. To achieve this, universities needed to actively capitalize their knowledge assets, open their mind about business orientation, have an environment promoting development opportunities, and manage the relationship between schools and businesses (Henry, 2004). After pioneering studies, the works focus on topics such as: Entrepreneurship of university students (Astebro, Navid, & Serguey, 2012; Kuttim, Marianne, Urve, & Aino, 2014; Aulet, 2017; Key factors affecting entrepreneurship in universities (Sternberg, 2014); Enterprises in the startup ecosystem (Fuster, Antonio Padilla, Nigel, & Ana, 2019), etc.

In Vietnam, the policy perspective on the development of science and technology enterprises in universities has been formed since the early years of the 21st century and has been gradually improved and adjusted to the practice. The Resolution of the 10<sup>th</sup> Congress of the Communist Party of Vietnam (2006) asserted: 'Strongly develop, closely combine scientific and technological activities with education and training to legitimately promote the role of leading national policy, then create a driving force to accelerate industrialization, modernization and development of the knowledge economy. Unify the orientation between the development of science and technology with the revival of education and training; promote the interaction and mutual promotion between these two leading fields of national policy'. After congresses with continuous supplementations and adjustments, the 8<sup>th</sup> Conference of the Central Committee of the Communist Party of Vietnam, term XI (in 2013) issued Resolution No. 29-NQ/TW on renovating basic and comprehensive education and training, meeting the requirements of industrialization and modernization in the context of a socialist-oriented market economy and international integration. In 2016, Prime Minister Nguyen Xuan Phuc signed and promulgated Decision No. 844/QĐ-TTg approving the *Support the National Innovation Initiative for Startup Ecosystem to 2025*. Following is the *Project on capacity building of lecturers and managers of higher education institutions to meet the requirements of fundamental and comprehensive renovation of education and training in the period of 2019-2030; Overall development strategy of higher education in the period of 2021-2030 with a vision to 2035*. The Ministry of Education and Training also promulgated Plan 239/KH-BGDĐT to implement the *Project to support students and students to start a business to 2025*; *Decision No. 1715/QĐ-BGDĐT Promulgating the Contest Rules 'Students with startup ideas'*.

In addition, the Communist Party of Vietnam and the Government of Vietnam have also issued many decrees, documents and circulars mentioning the commercialization of research results such as Decree No. 115/2005/NĐ-CP on the self-regulation and self-responsibility mechanism of public science and technology organizations; Law 04/2017/QH14 on supporting small and medium enterprises; Decree 39/2018/NĐ-CP on Guiding the Law on supporting small and medium enterprises 2017; Law 07/2017/QH14 Technology Transfer; Decree 76/2018/NĐ-CP Guiding the Law on technology transfer; Decree 34/2018/NĐ-CP on Establishment, organization and operation of credit guarantee fund for small and medium enterprises; Decree 38/2018/NĐ-CP on Investment for innovative start-ups; Decree 55/2019/NĐ-CP on Legal support for small and medium enterprises; Decree 13/2019/NĐ-CP on Science and technology enterprises.

Theoretical studies on spin-offs into science and technology enterprises in universities in Vietnam mainly stop at theses, topics and a number of research papers. Prominent among them are: Vu (2008) research on spin-off in research institutions; Bui, Le, Dao, & Nguyen (2011) research on how individual personality affects students' entrepreneurial potential; Nguyen's series of studies on entrepreneurship by Vietnamese students (2012, 2013, 2015, 2016); Nguyen (2014) research on the relationship between the commercialization of research outcomes in universities and spin-off, etc. Additionally, there are specific case studies of Ngo & Cao (2016), Pham (2016), Nguyen (2017), Duong (2019), Dinh (2020), etc.

## 3. Research Methodologies

To solve the set tasks, the article uses a handful of specialized and interdisciplinary research methods, consisting of statistical methods (statistical works related to the topic, tally of research results from the science and technology transfer model in several countries); comparative method (with comparison between the models under the survey research); historical method and logical method for systematic research from the past to the present, from start-ups to policies of countries like Vietnam and policies of the Vietnam National University, Hanoi; case study method and in-depth interviews with experts to help the research have multi-dimensional perspectives and practical theories.

## 4. Results and Discussions

### 4.1. Reality

To facilitate favorable conditions for science and technology transfer activities adhering to the model of science and technology enterprises, Vietnam National University, Hanoi has implemented numerous policies to support and bring positive effects to research and technology transfer, including policies on management of scientific and technological activities, policies on science and technology development strategies, policies on building and developing key research, strong research groups, policies on the formation and development of the Science and Technology Fund; institutional policies to support knowledge transfer and start-up innovation; start-up support activities of units in Vietnam National University, Hanoi.

Whether a scientific product or a research result can become a reality depends heavily on science and technology transfer activities, this transfer can be a whole process, idea or the transfer of a product. Transfer of research results is considered an indispensable part of research. For scientists from the Vietnam National University who used to chair science and technology topics and tasks, the survey results showed that no topic at any level was transferred more than 40% of the results. State-level projects transferred with the highest proportion were still only 40%, the second highest were other projects, business projects with 38.2%, while ranked at the last position is for grassroots projects with only 32.7% of research results were transferred. Studies in the humanities and social sciences have high transfer rates, all were above 54%. Meanwhile, in the field of sciences, the scientists leading research topics at all levels were higher in number compared to other majors, yet the transfer rate of research results was much lower.

The qualifications of the scientists who have transferred the research results also varied. At all levels, scientists with professor status had higher transfer rates than ones with associate professor status and doctorate degrees. For state-level projects, 71.4% science research of scientists with professor status had transferred research results, 15.5% higher than associate professor qualifications (55.9%) and 44.1% with doctoral degrees (27.3%). In topics and tasks of science and technology that scientists had participated in, the survey results show that most of the research results had been transferred. Specifically, the projects at the ministerial, provincial and city levels that have been transferred accounted for the largest proportion with 63.6%, the second was the state level with 61.3%, the third is the Vietnam National University, Hanoi with 51.6% and grassroots level accounted for the lowest rate – only 43.1%. The comparison among the areas of expertise of the scientists who participated in the research pointed out differences in the fields of the topics that had handed over the research results. The field of social science had a higher rate of topic transfer at all levels than in other fields, in which the rate at the ministry, province and city level had the largest rate with 85.7%. In the field of natural sciences with ministerial-level topics, provinces and cities had the highest transfer rate with 55.3%, the second was the state level with 51% and the remaining two levels were no more than 48%. In the field of engineering and technology, only the state-level project had the highest transfer rate at 50%. Notably, the field of jurisprudence had a transfer rate of research results at all levels above 85%. In general, the level of associate professor with the results of transferred projects at all levels was higher than that of professors and doctorates. In the state-level project, 60.5% of associate professors claimed to have transferred, 17.6% higher than the professor's degree and only 0.5% higher than the doctorate level. Another evidence was at the ministerial, provincial and city level, up to 74.3% of associate professors claimed to have transferred, while it was only 40% at the professor level and 60.3% at the doctoral level.

Thus, when presiding over a scientific and technological project or task, the transfer is lower than when scientists participate in research groups. This proves that, when it comes to the implementation of science and technology topics and tasks, the research team will transfer more easily, or it can be said that the power of many scientists can help the transfer better. It is an advantage when a scientist participates in research groups and strong research groups. In order to have a more objective view of the necessity of transferring and applying research results, the author of the article have collected opinions and evaluations from scientists and managers at Vietnam National University, Hanoi with frequency levels from low to high (corresponding to 'very unnecessary' to 'very necessary') which is shown in the Table 1 below. According to it, the closer the average value of each factor is to 5, the closer the rating is to the 'necessary' and 'very necessary' level, and the results are as follows:

| Extent                          | Frequency | Rate (%) |
|---------------------------------|-----------|----------|
| Very unnecessary                | 14        | 6.9      |
| Unnecessary                     | 2         | 1        |
| Neither necessary nor necessary | 21        | 10.3     |
| Necessary                       | 98        | 48.3     |
| Very necessary                  | 68        | 33.5     |

*Table 1: Assessing the Necessity of Transferring and Applying Research Results*

*Credit: the Author's Own Survey*

It could be seen that most scientists rated the importance and necessity in transferring and applying research results with mean value of 4/5. The most was 'necessary' with the rate of 48.3% and the second was 'very necessary' with the rate of 33.5%. Thus, there were 81.8% scientists asserting that science and technology transfer was at least 'necessary'. Compared with the actual survey of the transfer, there were certain differences: it was clear that most scientists chairing or participating in science and technology topics and tasks had the demand for transfer, but not all scientists could transfer research results. The explanation for this is that more than a half of the surveyed scientists had not actively sought

partners to transfer their research results (only 44%). It is in question that scientists still didn't believe in the quality of their research, so they had not searched for partners, or because of the difficulty in the policy mechanism. To better understand the difficulties the scientists encountered, the author consulted and found out the reasons for the difficulty in finding a transfer partner, the results were as follows:

| <b>Difficulties in Finding Partners and Transferring</b>                                         | <b>Mean (On the Scale of 1 To 5)</b> |
|--------------------------------------------------------------------------------------------------|--------------------------------------|
| Partners' information                                                                            | 2.99                                 |
| Administrative procedures in the transfer (intellectual property legislation, formalities, etc.) | 3.43                                 |
| Language barriers when communicating with foreigners                                             | 2.32                                 |
| Difficulties in pricing                                                                          | 3.48                                 |
| Difficulties in capital and financial resources                                                  | 3.44                                 |
| Other obstacles                                                                                  | 3.20                                 |

*Table 2: Difficulties in Finding Partners and Transferring*

*Credit: the Author's Own Survey*

The extent of difficulties in the process of finding and transferring results in the study varied. The largest mean value was 3.48/5 'in pricing', whereas ranked second was 'difficulty in capital and financial resources' with 3.44/5, the third is 'administrative procedures in transfer activities (intellectual property law, procedures, etc.) with 3.43/5 and the fourth was 'other obstacles' with 3.2/5. The remaining two difficulties were 'partners' information' and 'language barriers when communicating with foreigners' with mean value lower than 3/5, which meant these difficulties had less effect on the search and transfer of research results. Therefore, to be able to transfer research results in order to serve the community, this responsibility or duty was not only scientists' but also the cooperation of many stakeholders. To clarify this, the author held an in-depth interview with a scientist who is also a manager. According to him, *'the difficulties in the search and transfer process come from many factors. Despite such hindrances, we can still try and be proactive. But for me, pricing the product for scientists when transferring research results is extremely difficult for the scientists. In fact, it is unreasonable for a scientist to charge a high price, but sometimes to set a low price is very disadvantageous, since they have spent a lot of hard work and research effort on a scientific product, etc. I can tell because I am a scientist myself, not a businessman to be able to learn all the external pricing, so there will be no actual business insights about the price. Thus, in my opinion, it is very necessary to have an intermediary unit/ organization to help scientists achieve that.'*<sup>1</sup> This is further explained and more objectively when collecting scientists' opinions on the reasons for not being proactive in finding partners to transfer. The results are shown in Table 3 as follows:

| <b>Reasons</b>                                            | <b>Frequency</b> | <b>Rate</b> |
|-----------------------------------------------------------|------------------|-------------|
| Not knowing the transfer address                          | 37               | 32.2        |
| Not knowing the transfer and contact process              | 60               | 52.2        |
| Plentiful troublesome administrative procedures           | 24               | 20.9        |
| Organizations only focusing on formality, not application | 27               | 23.5        |
| Other                                                     | 17               | 14.8        |

*Table 3: Reasons for Not Actively Looking for Partners To Transfer*

*Credit: the Author's Own Survey*

As such, the reasons why 56% of scientists did not actively search for a transfer partner were shown in Table 3: 'not knowing the transfer and contact process' accounted for the most with 52.2%. The second was the reason 'not knowing the transfer address' with the rate of 32.2%, the third was 'organizations only focusing on formality, not application' with the rate of 23.5% and the lowest was 'plentiful troublesome administrative procedures' with the rate of 20.9%. In general, scientists did not transfer mainly because they were not clear about the process, in addition, there was still a proportion of them not knowing where to transfer, and administrative procedures also affected the transfer. Notably, there were organizations that only focused about the form and not the results, which will waste resources and budget. On the other hand, with the number of scientists actively involved in the transfer process, they often found partners and organizations that could commercialize their scientific products.

<sup>1</sup> In-depth interview, Associate Professor – Nam, 45 years old.

| Type of Organization                       | Frequency | Rate |
|--------------------------------------------|-----------|------|
| Enterprises with foreign elements          | 18        | 20   |
| State-owned enterprises                    | 22        | 24.4 |
| Domestic private enterprises               | 47        | 52.2 |
| Government and central management agencies | 36        | 40   |
| Local authorities and management agencies  | 45        | 50   |
| Domestic and international INGOs/NGO       | 18        | 20   |
| Others                                     | 1         | 1.1  |

*Table 4: Types of Organization to Which Scientists Transfer the Results*

*Credit: The Author's Own Survey*

The results in Table 4 demonstrate the fact that collaboration with private enterprises is the right direction in the general development trend of universities in the world. Scientists look for relatively diverse transfer partners. But only two types of organizations selected over 50 percent are 'domestic private enterprises' with the rate of 52.2% and 'local authorities and management agencies' with the rate of 50%. It is noteworthy that the research results were received by private organizations, instead of simply transferring to state units as before. The participation of the private sector in research will be the driving force behind research development and its practicality. In other words, linking private enterprises with technology transfer will bridge the gap among scientists and between universities and social life.

In fact, the results also illustrate that the combination of research capacity, the demand for transfer, the initiative to find participants, transfer partners, and the necessity of establishing satellite organizations/enterprises (spin-offs) objectively assesses the status of science and technology transfer of Vietnam National University, Hanoi. The problem is that capacity and demand do exist, but the method of transfer has not been figured out in accordance with current research capacity. Policy-related barrier is also a problem when it has not created motivation as well as mechanism helping scientists and managers access to the external social market and apply their products to daily life. To accomplish it, practical policies are needed as scientists answered. They are mere scientists, researchers, so in order to focus on researching and creating distinguished products, they are in need of the support from managers, and leaders at all levels. Particularly, intermediary organizations are necessary for scientists - 'The intermediary organization of the science and technology market is an organization providing brokerage services, consulting, promoting technology transfer, evaluating, valuation, technology assessment, connection and support services for supply and demand parties and other parties in technology-related transactions'.

#### *4.2. Two Models Implemented in Practice*

Based on the current state of research and transfer capacity according to science and technology enterprise model of Vietnam National University, Hanoi in different fields, it shows that science and technology development policies now focuses on research, lacking separate policies to develop start-up businesses. Moreover, when approaching and evaluating specific support policies for this organizational model, the majority of them are only inclined to contribute to research, and policies for the development of satellite organizations are facing challenges. The article explores two practical models of operation of two science and technology enterprises under Vietnam National University, Hanoi, which are the Natural Science Limited Liability Company under the University of Science and the IMBT Microbiology Technology Joint Stock Company belonging to the Institute of Microbiology and Biotechnology. The practicality of these two models would clarify the current situation as well as the difficulties and barriers that need to be solved and utilize the advantages they bring today.

The Natural Science Limited Liability Company under the University of Science was established under Decision No. 838 dated May 20, 2004 of the Rector of the University of Science according to Resolution 68/1998/QĐ-TTg of the Prime Minister on allowing pilot establishment of state-owned enterprises in training institutions and operating under the provisions of the Enterprise Law, the Law on Science and Technology, the Law on Higher Education. Its mission is to act as a bridge between science and technology and social life, supporting scientists and businesses in the development of research, application, transfer and commercialization of research results. During its operation, the company has not yet fulfilled its mission and expectations.

The company functions under the model of a limited liability company, with executive members appointed or seconded by the University of Science. The company has not had its own operating mode, so there has been an overlap in management process, and another challenge is that the company has applied the management mechanism of school to businesses. University leaders also deeply intervene in business activities through the procedure of reporting, approval, and request. Regulations on finance, capital and asset management are still based on general laws and policies, and internal spending regulations of Vietnam National University, Hanoi. Human resources issue also faces many difficulties in attracting workforce, especially high-quality ones.

The company's facilities consist of four centers and one factory. Although land for construction is available, the company still shares the research room in the University of Science. This has significant effects on the efficiency of machinery utilization. The company's technology transfer products result from research using the state budget. Intellectual property rights must therefore also comply with state regulations. In fact, a large quantity of scientific studies has been published, but the number of products qualified for technology transfer is modest. The reason for it lies in the fact that the topic's research results depend on the project leader or individual members, while intellectual regulations do not encourage research members.

The IMBT Microbiology Technology Joint Stock Company, formerly known as Microbiological Technology Joint Stock Company, was established in November 2015 with the business of research and development of experiments in natural science and engineering. In 2017, the company was approved to establish and operate as a science and technology enterprise under Vietnam National University, Hanoi. Its main fields of activity are: organization of trial production; manufacture of products from microorganisms and biotechnology; supplying traditional products of probiotics for pharmaceuticals, for the production of animal feeds, and preparations for treating environmental pollution; service of providing strains and classification of microorganisms, etc. Unlike the Natural Science Limited Liability Company, the IMBT Microbiology Technology Joint Stock Company operates under the model of a science and technology enterprise which achieves certain successes and strengths. Attracting capital and collaborative production have brought about a lot of huge investments, such as USD 2.7 million in 2016 in cooperation with NAN for support from the First project. The company was also assigned by Vietnam National University, Hanoi to use machinery, factories, and research equipment for the production of registered products.

However, in addition to the strengths, this model also revealed some limitations during the implementation process. Firstly, academic thinking dominates business thinking; and the mechanism of operation, responsibilities, benefits, risk sharing, and autonomy is unclear. Secondly, the state's management procedures are complicated, indecisive, avoid responsibility, and easily cause confusion among partners. Moreover, the lack of transparency about intellectual property rights also exposes investors to greater risk. These are the factors that directly affect the fortune of the company in 2019 when Vietnam National University, Hanoi decided to dissolve this business.

## 5. Conclusion and Recommendation

Vietnam National University, Hanoi has a great potential for scientific research, abundant human resources, not only plays an important role for the Vietnamese educational system but also stands at the 147th (up to 13 places higher than the previous ranking) in the ranking of Asia's top higher education institutions. Scientists are always actively participating in scientific research, implementing research topics and tasks at all levels. This is the starting point for scientific and technological products that can be transferred into real life. In fact, the science and technology transfer activities in general and the transfer under the science and technology enterprise model in particular still face a number of difficulties and obstacles, which directly affect the results as well as the quality of research and transfer models. Those barriers are in terms of mechanisms and policies, and lack of separate policies for the operation of science and technology enterprises. Aware of this, Vietnam National University, Hanoi, scientists and businesses are gradually making adjustments and remedies to maximize response and adapt to new circumstances, accelerate science and technology transfer activities in universities based on enterprise model, which focuses on such contents as:

First, the impediment of financial resources (investment capital) is also an equally important reason. Universities in Vietnam have been focusing on the main task of training activities, so with limited financial resources, the investment in science and technology transfer is almost nothing but the conversion value from brand value or some facilities such as used factories and machinery. Funding investment as well as policy support from all levels is necessary to introduce products and commercialize research results to the market<sup>2</sup>.

Secondly, science and technology transfer under enterprise model is quite new in Vietnam. However, in order to have a breakthrough development for this model in the Industry 4.0, it is suggested to have specific policies because a new idea can be a breakthrough or a potential risk. If managers at all levels only see novelties and trends but do not consider challenges, it will impose a danger. On the contrary, managers only see that it is not suitable for all regulations but do not dare to do it, there will be no leap for the development of science and technology<sup>3</sup>.

Third, it is necessary to overcome mental obstacles. Universities themselves also have to undergo internal revolutions to perform their roles and accomplish their missions, from focusing on merely transmitting knowledge through training activities for students to the further development of research activities that generate new knowledge through R&D activities. Universities have just focused on training activities, the concepts of innovation, technology transfer, intellectual property, spin-off or science and technology enterprise are still quite unfamiliar and have not received enough attention. However, along with the gradual progress of Vietnam's science and technology foundation as well as the pressure of the world's rapid change in the Fourth Industrial Revolution, there has been a change in thinking, especially from policy makers to educational administrators, scientists and society. The gap in thinking between academia and business has been gradually narrowed.

The fourth one is to overcome resource constraints. To begin with human resources, professional experts on innovation and technology transfer are almost nonexistent. Most schools are finding their own way. Therefore, a team with academic thinking running the business is also a reason leading to the failure of science and technology business activities.

Fifth, attention needs to be paid to investment in physical resources. There is still a gap between academic research and commercial products, and the technology needs to be perfected. Currently, Vietnam is investing in research to come up with inventions, useful solutions, and scientific and technological products. But those products just stop at the level of sample products, in order to reach the market, they have to go through the finishing and testing stages. Now there are no resources in terms of facilities such as testing and trial production zones to close the gap (Dung 2018).

<sup>2</sup> In-depth interview, male, Associate Professor, 60 years old.

<sup>3</sup> In-depth interview, female, PhD, head of an office, 44 years old.

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