ON THE TRIPLE HELIX MODEL FOR PROMOTION OF INNOVATIONS IN VIETNAM

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Abstract:

Innovations in Vietnam need suitable models for a better impact to the socio-economic development of the country. The triple helix to link the Public sector, businessmen and researchers get attention of various local and international study teams. In Vietnam, from macro vision, among 150 thousand of producing enterprises, only 0.1 - 0.3% of turnovers is invested for technological innovation and the actors of the triple helix remain relatively separated which leads to difficulties in creation of high added value. Based on experiences of many countries, this research deals with the triple helix models which can be applied effectively in Vietnam.

1. Introduction

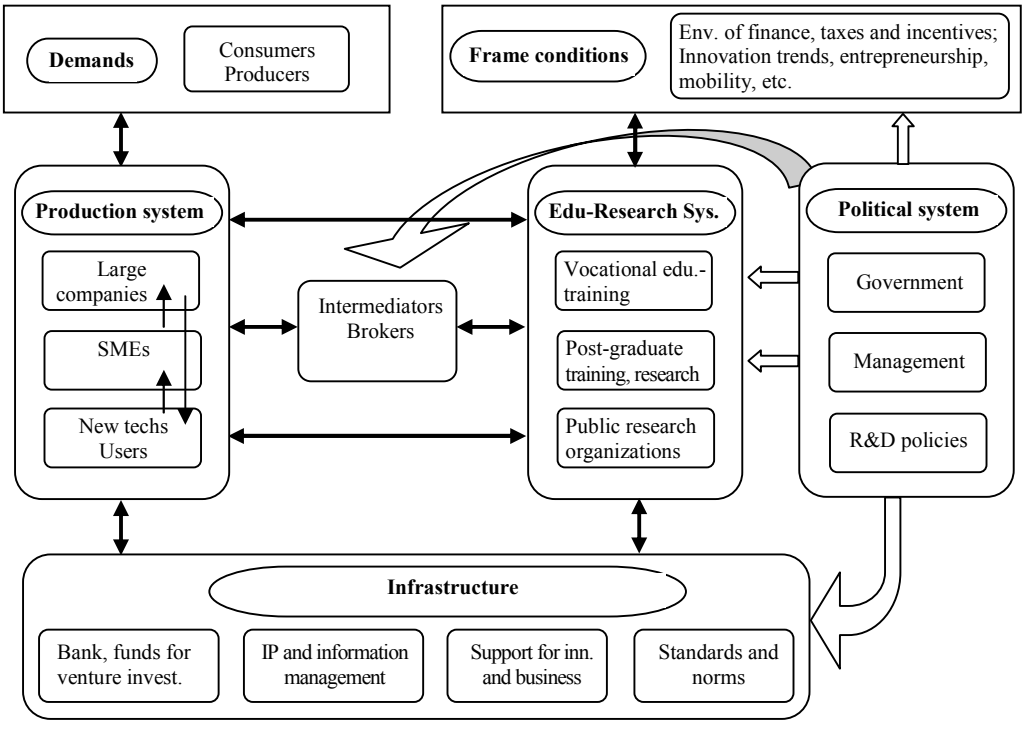
During recent years, universities and research institutes are realizing the effectiveness of links with enterprises in promotion of research, technological transfer and creation of market for science-technology based products. Some cases are evidences of initiatives to promote the cooperation, such as Hanoi University of Pharmacy implements cooperation with Traphaco Company to promote R&D activities for natural pharmaceutical products. This field is an advantage of Vietnam which is particularly encouraged by the Government, or Integrated Circuit Design Research and Education Center (ICDREC) of the Vietnam National University - Ho Chi Minh City signed the cooperation with IBM for technological transfer and IC manufacture. Some enterprises took initiatives in cooperation with universities in research and technology development. The model is now popularized for cooperation of the Vietnam National University - Hanoi, the Vietnam National University - Ho Chi Minh City with IMI Corporation, PetroVietnam Corporation. Some companies are successful in commercialization of technologies, such as BKAV of Hanoi University of Technologies, Linh Chi Company of the Vietnam National University - Hanoi, etc. The above cases, however, did not show well the role of management bodies. One can say the three actors in the triple helix remain relatively separated which lead to difficulties in creation of market

competitive products, even in the context of actual existence of S&T based enterprises, service organizations and S&T application and technological transfer centers. The practice requires to link the triple helix actors in a country where 97% of enterprises are SMEs, only 0.1 - 0.3% of turnover remains invested for technological innovations, and which has 1,200 S&T organizations with 70,000 staff and S&T management system from central to local level. According to Ass. Prof. Dr. Nguyen Manh Quan (National Economics University): *"It seemed that businessmen, researchers, State agencies and the public do not still consider the science and science activities in universities and research institutes as organically integrated component in the global economic system in general and in production-business activities in particular."*

On basis of experiences of the triple helix links in some countries, this paper will focus on the discussion for promotion of these links with the center attention made for "collaboration environment" of the three actors and proposes solutions to promote innovative researches in Vietnam. By this way the State agencies, businessmen and researchers position themselves in the common efforts to develop new products in the context of globalization and international integration.

2. Experiences of some countries in promotion of innovations

The triple helix links for promotion of innovations are dealt by many researchers [10-17]. In global view, these links are based on the available and almost completed infrastructure where the State plays the dominating role in the whole set of links. Enterprises keep the center position and the market plays the fundamental role in mobilising resources, actors and innovation stakeholders in well coordinated and close links for the best effects in an open environment. Public research institutes coordinate closely with universities to produce knowledge continuously innovated. The links between the two actors, namely producers and universities/research institutes are driven through intermediators and brokers for promotion of technological transfer and application of research results in production process. For facilitating these links, The State acts through top-down supporting policies and bottom-up infrastructure investment. Kulman and Amold (2001) resumed the triple helix models based on experiences of some countries in promoting innovation in Scheme 1 as follows:



Scheme 1: Three actors' links
(The State - Businessmen - Researchers)

In addition, in order to support the implementation of the triple helix models in "endogenous" environment for promotion of R&D activities and commercialization of research results, the authors resumed some experiences and useful methods in some countries in Table 1.

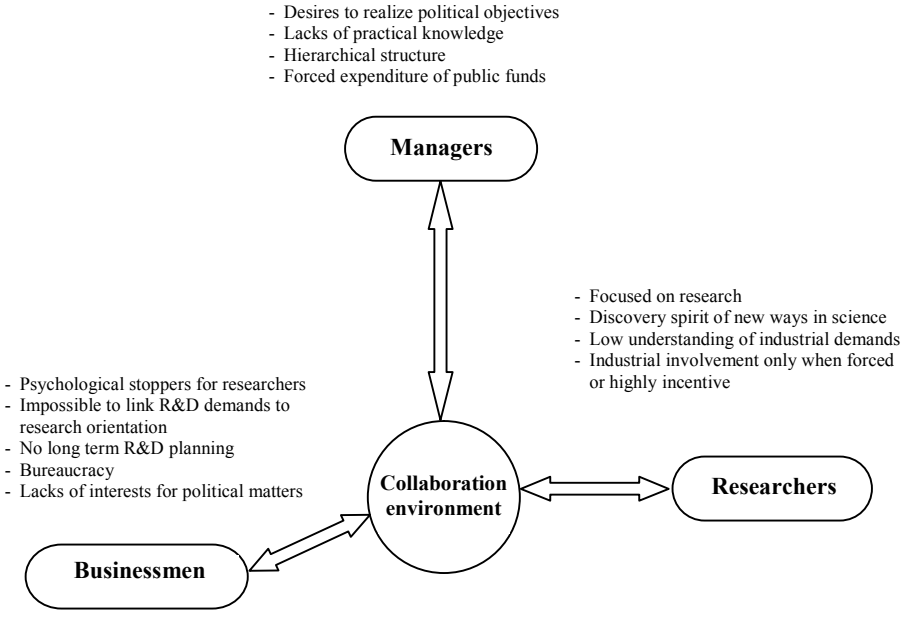
Table 1: Experiences of some countries for the triple helix links

No.	Country	Experiences (Ref. [10-17] for details)
1	**Japan**	- *The triple helix links*: Cooperation between the State and industries is the background. - *The triple helix coordination*: The three actors target IP rights and universities/research institutes - business links for better commercialization of research results.
2	**Germany**	- *The triple helix links*: The core role of the State. The State supports strongly public research sector; creates links between

		research sector and industries, sponsors education, particularly high level ones, to produce high qualified labor forces and experts - *The triple helix coordination*: The center is focused on strong businesses with R&D content higher than the medium level of other industrialized countries, strong resources for innovation development, innovation oriented industries, dominating role of automobile industries (1/4 of R&D resources) which is driving force for other fields.
3	**Italy**	- *The triple helix links:* Public-Private Partnership (PPP) is background (*Government makes policies; knowledge producing universities/research institutes, organizations in private sector, research centers, innovation intermediate organizations and financial institutions participate in the triple helix).* - *The triple helix coordination*: Organizations of various fields and the private sector to promote enterprises, development of innovation serving intermediators target the universities-business for better commercialization of research results, set-up of financial system to support activities of the three actors.
4	**USA**	- *The triple helix links*: The State's strong investment for business sector and research sector in connection to effective management of IP assets. - *The triple helix coordination*: The State sets up the links between the sectors of management, research and business. American administrative environment is extremely favorable business start-ups.
5	**China**	- *The triple helix links*: The State creates the institutional mechanism for enterprises to become the center of commercialization of research results. - *The triple helix coordination*: The National Innovation System (NIS) is based on collaboration of public research institutes and universities, combination of civil research and defence, and mobilization of specific advantages of key regions.

3. Proposals for application of the triple helix model for innovations in Vietnam

In order to promote innovations, this study proposes the triple helix model to be applied in Vietnam in Scheme 2:



Scheme 2: Model of links for promotion of innovations in Vietnam

In this scheme, the triple helix model is based on "*collaboration environment*" with the participation of stakeholders can be interpreted as follows:

First, managers with coordinating role are to create the favorable environment through legal tools, administrative structures and economical measures.

The State, as managers, always faces obstacles (of natural features). In order to improve this aspect, it is needed to pay attention to the following 5 basic matters:

(1) Respecting the principle of combination of driving force of science and drawing force of market. Management of S&T tasks is based on the offer system and the binding contractual liability;

(2) Keeping on the reform of institutional/management system of research institutions, basical reform of funding systems oriented to outputs and high efficiency, correct end-user funding, right funding procedure, transparent checking and auditing procedures, S&T management structure to be simple, clear, reasonable and interconnected, useful and feasible assignment of research contracts, etc;

(3) Encouraging and promoting the application of S&T advances by enterprises, service organizations and active S&T application in production. Particularly, the technological transfer and equipment procurement are governed by the State support policies and linked to individual liabilities. For example, the severe liabilities and fines are to be imposed to the lacks of responsibilities or personal interests for import of outdated/unproper machines/equipments;

(4) Conducting the strong reform of administration system of S&T staff in conformity to trends of knowledge economy and global integration. The State is required to issue the concrete policies to honor talented scientists, respect the results and quality of research works, correct policies for young scientists (salary, additional supports, titles) and other incentive measures;

(5) Conducting the reform of S&T State management system in rural areas. Particularly, Vietnam is an agricultural nation with a high rate of rural population, then the rural aspect is the key market for S&T development to implement its role and mission.

In addition to the general national policies, the State should have a separate policies to bring S&T development to rural areas which would play the kick-off role for economic development and encourage farmers to participate in research and development of technologies.

Second, researchers with their own S&T products are inputs and measurement of success of the "*collaboration environment"*, therefore require more focused investment.

Actually, over the whole country, there exist 1,260 registered S&T organizations, which is 2.5 times bigger than the one by 1995. Basically, however, it is possible to say, the technology providing capacity of S&T organizations for the *"collaboration environment"* is low. Actually, they can be divided into two big groups, namely:

- S&T organizations of small size which do mainly research and consulting (prevailing part);
- S&T organizations of big size which include about 80 big research institutes and technological universities (having units of technological research and development functions). They are capable of research of absorbing and adapting import technologies and also capable of creation of new technologies to be transferred to production. It is required to make a focused and effective investment for these organizations.

Third, producers - businessmen (entrepreneurs) have both the roles of driving force and the *"collaboration environment"* (as outputs).

The technological demands of the whole society greatly depend on the quantity, capacities and needs for technological innovations of producing enterprises. According to survey data, 98% of enterprises have needs of technological innovations, but they, large and small size, have limited capacities for technological innovations [9,10]. The solutions, therefore, for this problem of producing enterprises is the measure to create the *"collaboration environment"* through favorable links which would the following practical "conflicts":

- Enterprises need enhance their financial capacities and S&T development level. The costs for selection and adaptation of technologies, however, remain bigger than their capacities. In general, the expenditures for technological innovations of local enterprises are small, and about 89% of enterprises cannot produce strategies for technological innovation investment. Therefore the State and management policies should make a trouble-shooting in this aspect;
- The application of IP tools for control of activities and business of enterprises remains low. Many of enterprises have no website. In some cases when they have it, the data are not updated regularly. In addition, the management skill of enterprises needs to be enhanced through suitable tools and methods during the new development stage.

Briefly, in the actual context of the country, the *"collaboration environment"* model in the triple helix links remains novel and particular if we can do it well. This proposed model reflects the involvement of the three actors and objective elements of socialist oriented market mechanism.

4. Solution for application of the model

In order to implement in practice the successful application of the *"collaboration environment"* model in the triple helix links, the following proposals and solutions are proposed, namely:

4.1. Innovation of S&T management works with special attention focused on training of S&T human resources

The key and primordial tasks are to provide strong policies for innovation of S&T management in all levels, from the Government through line ministries to local level. Many existing management practices need to change radically in the direction "job looks for in-charge-person", "who does it most

effectively" and "international standard based measurement" in fundamental research.

In the field of sciences, the training of researching staff is the key task which would be conducted in direction "the quality prevails the quantity". It is not only the S&T tasks are important but also to have large scale decisions which would produce basic changes. It is particular to attract talented scientists to follow the scientific carriers and to introduce a "competition-based" mechanism of appointment.

4.2. Development of service organization of technological transfer

The set-up of units and organizations for technological transfer had become an effective kick-off of R&D activities in universities/research institutes over the world. During recent years, this model started in Vietnam, namely, the Hanoi National University, Hanoi University of Technologies, the Hochiminh National University. This model should be promoted further, namely.

- Center of excellence;
- Licensing Office;
- Value producing centers;
- Technological incubators;
- Idea transaction platform;
- University Spin-offs;
- Industrial zones linking offices.

4.3. Promotion of the triple helix model in the same S&T tasks

The links between universities - research institutes - enterprises are set up gradually, particularly the model of coordination of those who conduct the same S&T task of big scale. This coordination would let link the teaching/learning/researching activities of universities and research institutes to production and business practice of enterprises. With this model, the sides can maximize, share and mobilize high quality resources, laboratories, research infrastructure, and by this way they can close the loop for commercialization of research results, implement high profiled application researches oriented for enterprises. Enterprises can also profit research results of high qualified researchers without doing hard investment.

4.4. Improvement and set-up of legal spaces

The set-up of solid legal spaces to encourage and facilitate R&D activities, technological transfer and S&T market are the top important task which would provide background for IP protection, benefit sharing, etc. These mechanism and policies have to facilitate and encourage teachers and scientists from educational and research institutions to set up S&T-based enterprises. They may participate in activities of management, control, capital raising and others. In addition, the mechanism and policies need to be more clear and concrete in control of technological transfer (*business registration, classification of technologies, limitation, checks, inspections, etc.)*

4.5. Selection of research based on technological demands

In the actual context of limited resources of Vietnam, the important consideration should given to development of "suitable technologies" which are based on actual demands. They are namely those for products of national advantages. These technologies can be applied largely and fit well the majority of users. The practice shows that the inventions and advanced techniques created by scientists and even ordinary users can lead to new movements in S&T application for a higher efficiency of labors.

4.6. Approach/acceptance/use of S&T information on suitable invention and technologies

The effective use of stored database of inventions and solutions during the process of research and application in conformity to actual production-business practice would lead to the search of "suitable technologies". This would help universities/research institutes to orient their research activities, reduce costs, avoid the overlapping researches. There exists actually a reality that there is no search and use of the "warehouse" of inventions. The main reason is this database does not come to research institutions. In some cases, researchers may know but do not use it or do it without cares. It is the large waste of resources.

4.7. Diversification of S&T funds, mobilization of social resources

In addition to diversification of funds for scientific research, it is necessary to have mechanisms and regulations for effective use of funds and maximization of efficiency of S&T research and R&D activities. We need also to mobilize social resources, individual and organization (including the one of enterprises) for active support for S&T activities and technological transfer, particularly the financial resources.

4.8. Promotion of international cooperation

International cooperation is to speed up the integration and maximal use of external resources, catch-up new technologies for possible application in our conditions. It may lead to use external advanced research facilities, to train high qualified and well targeted human resources, particularly for key fields of biology, aerospace and automation, etc.

Conclusion

As purpose to promote innovations, this study deals with the experiences of other countries to identify the triple helix model which is suitable for Vietnam in context of integration. The above proposed model can make expect the equal participation of the actors and the provision of their legal benefits in the Vietnam regulation framework. Once applied drastically, the model will be effective to promote innovations in many aspects such as guiding, pushing and etc.

The implementation, however, of the model for promotion of innovations in Vietnam requires attentions for the following problems:

- Understanding of demands of users.
- Integrated links between research - production - market elements.
- Connection to external S&T network.
- Rich experiences and high prestige of R&D staff.
- Strong R&D implementation among enterprises.

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