EXCHANGE FOR POLICIES

DISCUSSION ON THE CONCEPT OF TECHNOLOGY AND TECHNOLOGY TRANSFER IN THE PREVAILING TECHNOLOGY TRANSFER LAW

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Abstract:

The paper "The prevailing Law on Technology Transfer needs to be amended" by author Do Thi Bich Ngoc, Ministry of Science and Technology published in the Vietnam Science and Technology Journal, No.22/2014, had pointed out some inadequacies of the prevailing Law on Technology Transfer and suggested direction for further amendments and revisions. This paper below is a continued effort to comment on irrelevant points of the Law on Technology Transfer, focusing mostly on the concept of technology, technology transfer as specified in the Law, and propose direction for readers to further exchange discussion with a view to contributing together to the improvement of the Law.

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1. Concept of Technology

By definition in the Law on Technology Transfer: "*Technology* is the technical solution, process, know-how with or without accompanied tools and means used to transform resources into products" (Article 3.2 of the Law on Technology Transfer). This concept coincides as well with the concept of technology indicated in Article 3.2 of the 2013 Law on Science and Technology. In the Law on Technology Transfer, the concept of "*Technical know-how*" was interpreted as "the information accumulated, discovered by the technology owner during the process of undertaking research, production, business, which plays a decisive role in ensuring the quality, competitiveness of technology, technology products" (Article 3.1 of the Law on Technology Transfer). From this concept defined by the Law on Technology Transfer, we refer to the concept of "business secret", an object being monopoly protected by the Law on Intellectual Property,

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where it says: "*Secret business* is the information obtained from financial investment, intellectual activities, which has not been undisclosed and is potentially used in businesses" (Article 4.23, Intellectual Property Law). So, "technical know-how" should be considered under the cluster of "business secret", because all the information obtained has come from business, crystallized from intellectual labor and could be used in business and other fields. Though "know-how" and "secret" have similar connotation, i.e the information is hidden, the implicity of "technical know-how" is narrower than "business secret" because "business secret" includes not only "technical know-how" but also other non-technical secrets which are associated with activities in the process of production/business of enterprises. In the field of intellectual property, beside those protected objects, whose technical information must be disclosure, "business secret" is a form of self-protection following a special mechanism.

Previously, when referring to technology, we used to talk about something in technical sector. But now, it also covers service sector (possibly associated with technical and non-technical subjects), for providing solutions to transform resources into products/services. For example, technology in the field of financial, banking service to improve the way and measure to mobilize, use capital, raise the number of rotation of revolving funds effectively. Furthermore, technology does not just take place in technical field, or field of business, it could appear in all sectors of the economy, including national security and defense, recreation, entertainment activities,… The legendary "magic crossbow" of King An Duong Vuong may be an example of technology secret in the military field in the early stages of defending and building our glorious nation. So, we think we should use "secret" as general term to replace the term "technical secret". This term has a broader sense, more proper with the world trend. Specifically, it shall cover technology used in the service sector which now shares 60% - 70% of the world GDP[2].

On the other hand, when referring to solution, i.e the way or means of solving a problem, we can have it by using a "product" (i.e by a means of tool or a specific material) or possibly by applying a "process" (working procedure, work organization/arrangement). Under the mathematical angle, in terms of grouping, "product" and "process" are two subsets of the set "solution". It means "solution" includes "product" and "process". The interpretation of the government Decree No. 13/2012/ND-CP dated 02nd March, 2012 (Decree 13) and the Ministry of Science and Technology Circular No. 18/2013/TT-BKHCN 01st August, 2013 (Circular 18) concerning the term "initiative", was very comprehensive in line with the

[2] The service sector currently shares 60% of the world GDP. In OECD countries, this proportion reached 70%. Share of the service sector accounts for 90% of Hong Kong's GDP, 80% of United States', 74% of Japanese, 73% of French, 73% of the UK's, 71% of Canada's, respectively [18].

above mentioned approach. Accordingly, in Decree 13 and Circular 18, it considered innovative solutions were those including technical solutions, management solutions, operational solutions, technical progress application solutions (Article 3.1 of Decree 13). While technical solution was defined as "technical method, technical means to solve an identified task/problem), including: a) Product, in the form of *an object* (e.g, tools, machinery, equipment, accessories); *substances* (e.g materials, substances, foodstuff, pharmaceuticals, cosmetics); *biomaterials* (e.g micro-organism, probiotics, genes, genetically modified plants, animals); or *plant seeds and animal breeds*; b) Process (e.g, technology process, processes of diagnosis, prediction, testing, processing, cultivation, farming techniques, processes of medical diagnosis and treatment for people, animals and plants,...) (Article 3.1 of Circular 18).

Now, back to the concept of "technology" mentioned in the Law on Technology Transfer, we found that it was clearly incomplete. It was both redundant and insufficient, because when considering "solution", it should not list "process" in an independent and parallel way as "process" is only a subset of "solution". If we want it to be clearer, the term "solution" should be totally abolished, and replaced by the term "product" to reflect the concept of "technology" or use other alternatives which are suggested specifically in this article below.

In a paper presented at the workshop on Technology Transfer[3] held by end of 2014, Mr. Tran Van Hai, the author of the paper, also analyzed, made comments on this issue [22]. He thought that technology encompasses objects, substances, processes. While provisions of the Law on Technology Transfer (which indicated that technology was solution, process, technical know-how…) were "really hard to interpret for the case where technology was tools and means (technology product type) for the subsequent technology transfer to the same transferee" [22, p.1]. In his opinion, he thought that there were some inadequate points in the concept of "technology" indicated in the Law on Technology Transfer. However, though findings by Tran Van Hai were right, it was still not sufficient. Actually, the main cause of the problem was the logic error in the concept of "technology" of the Law because "process" is a concept of independent nature while "product" implies objects, substances, biological materials, plant varieties and animal breeds as mentioned above.

On the basis of the above interpretation and analysis, the concept of technology in the Technology Transfer Law should be redefined in line with one of the following options:

[3] Workshop on: "Technology Transfer Organization and Operation: the Australian experience and lessons learnt for Vietnam", held in Ho Chi Minh City, on 30th December, 2014.

Option 1: “Technology is the solution, the secret with or without tools and means accompanied to transform resources into products”.

If this option is selected, it should add concepts related to solution, including (1) types of solution (technical solutions, management solutions, operational solutions, advanced technology application solutions[4]); (2) Connotation of the solutions (whether solutions include products or processes) as analyzed, mentioned above.

Option 2: "Technology is product, process, know-how or other solutions with or without tools and means used to transform resources into products”.

Option 3: "Technology is object, substance, biomaterials, plant varieties and animal breeds, process, know-how, or other solutions with or without accompanied tools and means to transform resources into products”.

Other solution mentioned in option 2 and 3 above can be management solutions, operational solutions, advanced technology application solutions, computer programs, technical specifications, technical designs, etc.

The Option 3 was the one selected by the author of the paper as it was clearer and more specific compared with the other options, it help readers imagine what the technology is, including what objects. In reality, with the current concept of technology defined in the Law on Technology Transfer and the Law on S&T, it may make many people both inside and outside the S&T sector feel confused as it is still vague about technology. Due to misunderstanding about the concept of technology, not being properly equipped with knowledge on technology and technology management, the majority of staff working in the state technology management of our country is quite embarrassing to solve related issues. As a consequence, the efficiency and effectiveness of the state technology management is not high and become a quite difficult problem which requires a comprehensive solution from the top to the bottom, from the theory to the practice. Technical knowledge is only a necessary condition for technology management, but not sufficient. It also requires knowledge on commercial, legal and other related specialized knowledge.

In addition, it should be noted that logic error in the Technology Transfer Law is not only reflected in the concept of "technology", but also in somewhere of the Law, especially in the clauses interpreting the concept. For example, in respect of the term "technology transfer promotion ", the Technology Transfer Law said: “technology transfer promotion is an activity to foster, create and look for technology transfer opportunities; provision of advertising, display, technology introduction services; organization of technology markets, fairs, exhibitions, technology

[4] For further reference, see Circular No. 18/2013/TT-BKHCN of 01st August, 2013.

transaction centers" (Article 21.3 of the Law on Technology Transfer). According to the interpretation, definition of the Law on Technology Transfer, technology transfer promotion mainly consists of three groups of activity: (a) Activities to promote, create and look for technology transfer opportunities; (b) Provision of advertising, display, technology introduction services; (c) Organization of technology markets, fairs, exhibitions, technology transaction centers. We saw that group (a) were general activities; group (b), (c) were specific activities of those in group (a). We think the above interpretation and expression of the Law on Technology Transfer was inappropriate. We can refer to the definition of the term "trade promotion" in the Trade Law as follows: "*Trade promotion is an activity to promote, look for opportunities to trade goods and provide services, including promotional activities, commercial advertisement, display and introduction of goods, services and organization of trade fairs, exhibitions*" (Article 3.10, Trade Law). Thus, the concept of "Technology transfer promotion" in the Technology Transfer Law should be revised as follows: "Technology transfer promotion is a collection of activities and institutions to promote, create and look for opportunities to transfer technologies, including activities and institutions related to promotion, advertisement, service provision, display, demonstration of technology, organization of technology markets, fairs, exhibitions, technology exchange center and some other activities".

2. Concept of technology transfer

As defined by the Technology Transfer Law: "*Technology transfer is the transfer of the ownership or the right to use, entirely or partly, the technology from the technology owner to the technology recipient parties*" (Article 3.8, Law on Technology Transfer). So, the concept of technology transfer in the Technology Transfer Law refers to the legal aspects of technology transfer. This approach is similar to the approach of WIPO[5] when discussing the concept of technology transfer. WIPO said: "*Technology licensing (technology transfer) only occurs when one party owning valuable intangible assets, i.e, the intellectual property, has the legal right to prevent other persons from using that property. A license made is to express the consent of the owner to allow others to use the intellectual property, and in exchange, to receive an amount of money or other type of property. Technology licensing cannot happen without an intellectual property available"* [17, p. 4]. This means that: technology transfer always takes place when the technology owner has established his/her intellectual property rights to such a technology. The establishment of this right is optional, some cases are and some cases are not compulsory to register with the state competent agency (e.g: business secrets, computer

[5] World Intellectual Property Organization.

programs,...). In this view, when everybody has ownership or right of use towards technology, there will not have technology transfer happened because everyone has the right to exploit and use the technology. Therefore, with stipulations specified in the Law on Technology Transfer: *"The technology to be transferred can or cannot be associated with industrial property objects "*(Article 7.2 of the Law on Technology Transfer). Or *"organizations and individuals owning the technology protected, in Vietnam or elsewhere, by industrial property right but its protection time has expired, shall be allowed to transfer the right to use such a technology*" (Article 8.3, Law on Technology Transfer). Some researchers thought that these clauses should be "redebated" or "this conflicting provision is unacceptable compared with the views of the world regarding technology transfer". To solve this problem, the author of this paper will go further to analyze the concept of technology transfer in a deeper and more comprehensive way.

Currently, the concept of technology transfer has been mentioned under many different angles in literature, namely:

- "Technology Transfer Handbook" published by the Ministry of Science and Technology (translated from the English version "Technology transfer - an ESCAP training manual" compiled by the Economic and Social Commission of Asia and Pacific region (UN/ESCAP), whereby it says: "technology transfer means technology that moves across national borders" [14, p. 18];
- Tran Tinh, a Chinese scholar [20], said: "The normal concept internationally accepted is: technology transfer is the process of diffusion of a group of knowledge based on a certain type of technology, representing a certain level of technology. According to UNCTAD: Technology transfer is the systematic transfer of knowledge on production of a certain product, or on application of a certain technology process or provision of a certain service. It does not include the sale and lease of goods; According to OECD: technology transfer is the move of invention made by a country (including new products and new technologies) to another country; The definition of China on technology transfer mainly consists of the transfer of knowledge in a systematic way, the transfer between phases of the technology movement, i.e, from basic research → applied research → experiments → commercialization; New application in existing technologies";
- Nguyen Thuy Quynh Mai, Nguyen Thuy Quynh Loan [19], introduced the concept: "*Technology transfer can be understood as the move of technology from one entity to the other(s), successful transfer of technology is obtained when the technology recipient has clearly understood and is able to use the transferred technology effectively.*

Conversely, if the recipient has not mastered the transferred technology and is not able to use it effectively, the transfer shall be considered incomplete";

- Training materials on technology innovation and technology innovation management (technology management training materials) [15, 16], in addition to the concepts of technology transfer mentioned above according to Technology Transfer Law, the concept technology transfer is also summarized as follows: "In general view, technology transfer is the move of technical knowledge out of the place where it was created; In view of technology management: technology transfer is a collection of technical, commercial, legal actions to make the technology recipient agent have the same technological capacity as the technology transferor in production and business; In view of international technology transfer: technology transfer is the transfer and reception of technology across borders";
- The Regulation on initiatives issued under the Decree 13 when referring to the transfer of initiatives specified: "*Transfer of initiatives is to convey all the knowledge and information of the initiative to transferees for them to be able to apply initiatives*" (Article 2.2 the Charter initiative, Decree 13).

Temporarily, the views on the concept of technology transfer can be summarized in 6 following basic main points:

- Technology transfer is the transfer, partly or entirely, of ownership or right to use technology from the party owning technology to the technology receiving party;
- Technology transfer is the application of available technologies;
- Technology transfer is the systematic transfer of knowledge on production of a certain product, or on application of a certain technology process or provision of a certain service;
- Technology transfer is a collection of technical, commercial, legal actions to make the technology recipient agent have the same technological capacity as the technology transferor in production and business.
- Technology transfer is the movement of technology across national borders;
- Technology transfer is the transfer between phases of technology movement from basic research → applied research → pilot production, testing → commercialization.

From the above analysis, it was found that: concept of technology transfer varied and were diversified. They are not against but complimentary each other. Which concept is to be used, it depends on specific context and conditions. For example, the concept in the Technology Transfer Law of Vietnam, or the concept of WIPO is only one of the concepts of technology transfer. This view only reflects the perspective of the transferring party, not a general, complete and appropriate with specific characteristics of a country like Vietnam which often receives technology from abroad and has the desire to acquire new technologies from abroad for sustainable development. Thus, there still exist opinions that "there are unacceptable inconsistencies in the Law on Technology Transfer of Vietnam compared with the views on technology transfer of the world", if yes, it is only relevant in terms of legal aspect and the right to transfer intellectual property objects.

However, as technology is a particular type of goods unlike all other kinds of normal goods, sometimes it is not easy to acquire it by money. Because the path to approach and master technology is not so simple. The typical process that people follow to master technology requires moving through various steps, in order to gain the ability, namely: “operation → installation → repair → copy → adaptation → improvement → technological innovation”. Not any entity having ownership over technology can operate, exploit, use technology. Technology is a subject very difficult to control, bargain and its transfer is difficult to be successful. Production process consists of not only one or two single controllable technologies. A system or production line includes multiple technologies from many different disciplines, fields. In addition, besides engineering technologies, there are also technologies in the field of organization, management, trading, services. It would say that an individual with many talents he/she cannot master all the technologies of all sectors and all fields utilized in production systems. For example, a TV set has hundreds of components integrated of many different technologies relating to materials, design and manufacturing processes that make a TV. Each television manufacturing company has its own design, organizational process, production and sale management depending on scale, natural conditions, culture of the country where the production facilities are located. Many businesses in Vietnam in early stage of the open economy had to spend billions of dollars to buy technologies, get ownership, right to use technology, but the technology acquired could not put into full place because of insufficient knowledge to operate the technology, technology transfer failed due to the application of inappropriate technology. Therefore, the view “technology transfer is the application of existing technology" (a) or “technology transfer is the transfer of systematic knowledge on production of a certain product, application of a certain technology process or provision of a certain

service" (b) shall be suitable for Vietnam as well as the nations with low starting point of technology level and always need to receive technology from abroad. This is also consistent with the provision on technology transfer objects, i.e: "technical knowledge of technology is transferred in the form of technological options, processes, technical solutions, formulas, specifications, drawings, diagrams, computer programs, information, data" (Article 7.1.b, Technology Transfer Law), as well as the modality of technology transfer. Under the provisions of the Law on Technology Transfer, the following transfer modalities can be used: "(1) transfer technical document; (2) training for technology receiving parties for understand and master the transferred technology within the period specified in the technology transfer contract; (3) sending technical experts to the field where the technology is used by the receiving party to make sure that the quality of technology and products involved is satisfactory as agreed upon in the technology transfer contract; (4) Other transfer method agreed by the concerned parties" (Article 18, Law on Technology Transfer). The concept (a), (b) would explain the provisions of Article 7.2 and Article 8.3 of the Technology Transfer Law as mentioned above. The cost of technology transfer is understood here as the cost involved in technical training provided for the technology receiving parties enabling them to get the technological capacity as agreed by the two parties in the already signed contract for technology transfer. In the opinion of one Vietnamese expert in technology transfer[6]: for enterprises, technology transfer is not only the purchase of a normal commodity (commercial factor) but also relates to the "way" how it would be acquired and the "right" in the technology negotiation process. The "right" here is not merely the ownership and right to use technology, it also linked with right to improve, distribute, export products associated with technology[7]. Success of technology transfer depends on the legal basis, capacity and willingness of the transferor, and on the other hand, the negotiating skills, technology identification capability, determination effort to get technology of the receiving party. In which, the transferor's goodwill and the recipient's negotiating skills is the decisive factor, because the transferor normally do not want to transfer all every secrets and right to use technology, it depends, to large extent, on the negotiation skills of the receiving party; and also the transferor do not want the receiving party get strong power of great value beyond the terms and conditions specified in the contract in order to prevent risks caused by the receiving party. In the mean time, the receiving party normally does not know how to ask the transferor to disclose the nature of technology; how to

[6] MSc. Nguyen Bao Hung - former Deputy Head of the Legal Department - Ministry of Science and Technology.

[7] See also: Nguyen Van Anh, Nguyen Bao Hung, Le Vu Toan (2012) *Technology Protection in Vietnam: some issues enterprises need to know*. Journal of Scientific Activities - Ministry of Science and Technology, No. 637, June /2012, p. 52 - 56, ISSN 1859 - 4794.

claim what they have been entitled; how to deal with risk prevention in the technology acquisition process. So, the following concept may be considered perfect on the standpoint of the technology receiving party: "*Technology transfer is a collection of technical, commercial, legal actions to make the technology receiving party have the same technological capacity as the transferor in performing production and business*".

However, technology transfer attached to objects protected by intellectual property is different to technology transfer linked to objects without association with intellectual property (which merely transfer knowledge relating to technology) in following aspects: In some specific cases, the contract duration for the object with IP protection, technology transfer must be effective at least until the time technology is protected. For example, Company A owns the technology X. X is protected in the form of monopoly patent in Vietnam, with 18 years of protection. Company B in Vietnam receives the monopoly patent to produce and distribute the product using technology X in Vietnam. The term of the contract to transfer technology X which company B signed with company A must be at least 18 years. So, if the duration is less than 18 years then after the technology transfer contract expires, Company A may sue company B and the parties who have purchased products associated with technology X (which were produced within the contract term), it leads to violation to intellectual property rights for technology X. If it is merely the transfer of knowledge, not associated with the object under intellectual property protection, the duration of the contract can be freely agreed upon by the two parties.

From the perspective of state management at macro level, it is often considered that the move of technology is technology transfer as at this level the concern is often put out to attract new, advanced technologies to make effect on economic restructure towards modern production, promoting production, improving competitive capacity of the economy, job creation, more contribution to the state budget; prohibiting or restricting those technologies having negative impact on the national culture, society and environment. The author of this paper completely agrees with the view "there needs to issue separate regulations for management of different types of technology transfer: technology transfer from Vietnam to abroad; technology transfer from foreign countries to Vietnam and technology transfer within the country" [21] because each type of technology transfer has its own features, it may receive incentives for transfer or may be prohibited and restricted. However, the author of this paper completely disagrees with the view of those authors who regarded "technology move is not technology transfer" [21, p. 9]. If it is the case, we can raise a question: which basis we rely on to manage the technology transferred from abroad into Vietnam through projects with 100% foreign direct investment (FDI), or under franchise contracts (accompanied with technology) in the Trade Law. While obtaining

achievements in technology transfer from these channels we can encounter many risks, even disasters if there is loose state management over the technology transfer from these channels, such as problems of environmental pollution, price transfer causing tax losses for the state budget.

For "technology transfer between phases along the movement of technology", in other words, the transfer of research results from scientific research and technological development (R&D) process, it was referred in the Law on Technology Transfer as the transfer of eligible right, as follows: "The State delegates the technology ownership over the research and technological development results using the State budget to the host organization performing such research and technological development projects, unless otherwise specified by other laws" (Article 40.1 of the Law on Technology Transfer). In the Science and Technology Law 2013, there was also one specific item (item 5, chapter IV) regarding ownership and copyright of R&D results. Law on Science and Technology stipulates that "organizations and individuals who have invested their financial, material resources for performing S&T tasks shall be the owner of the results of such scientific research and technological development, except otherwise agreed upon by the eligible parties involved in the contract for scientific research and technological development" (Article 41.1, Science and Technology Law 2013). However, in Article 41 of this Law, it also prescribed: "*Representatives of the state ownership specified in Clause 2 of this article has jurisdiction to transfer all or part of the ownership or right to use over the results of scientific research and technological development created using the State budget in line with the Government regulations regarding roles and functions of host organization in charge of implementing S&T tasks*." (Article 41.3, Law on Science and Technology 2013). At the same time, to provide detailed instructions for technology transfer from R&D results in pursuant to the Law on Science and Technology 2013 and the government Decree No. 08/2014/ND-CP, the Ministry of Science and Technology issued afterward the Circular No. 15/2014/TT-BKHCN dated 13th June, 2014 prescribing procedures for transfer of property right, right to use the results of scientific research and technological development using State budget. It was observed that there was no contradiction in the perspective of transferring R&D results between the Technology Transfer Law and the Law on Science and Technology 2013. Therefore, in view of the author of this paper, it is not necessary to revise this respect in the upcoming amended Technology Transfer Law. The action needs to be taken, if any, is to develop additional mechanisms and policies to create favorable legal corridor so that the R&D results obtained are quickly introduced into life. It is also the way to attract new technologies from foreign sources to Vietnam which have been for a long

time forgotten by ourselves leading to limited new technologies transferred from abroad and from inside the country to production/business[8].

Thus, through the above presentation it shows that the concept of technology transfer is rather diversified. Therefore, it is necessary for the Technology Transfer Law to provide give a distinct definition to ensure an appropriate generalization. According to the author of this paper, the current concept in the prevailing Technology Transfer Law is in line with the view of WIPO on technology transfer, however, it should not stop at the transfer of right of the subjects specified in the Law on Technology Transfer. If the concept of technology transfer was kept as it is at present it would not be consistent with the current provisions of the Law on Technology Transfer. In order to ensure the generality of the Technology Transfer Law, the concept of technology transfer in the Law transfer should be redefined as "Technology transfer is the shift of technology out from the environment where is was created". Environment here may be a national environment or an organization or an individual or a stage of research and development,...

3. Suggestions and recommendations

Based on the above analysis, it is proposed for the Law Revising Committee to amend the Technology Transfer Law accordingly with the concept of technology, technology transfer and the inner nature of technology and technology transfer, appropriate to the objects regulated by the Technology Transfer Law and specific characteristics of Vietnam, a country primarily involved in the technology transfer process as technology recipient country towards achieving its sustainable development objective in the current period./.

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