

The national development of the philippines commerce essay



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Necessity is the mother of invention. In the Philippines, there are many local inventions created by Filipinos that are locally and even globally used for its functionality and its usefulness. In fact, there are numerous inventions patented in the Philippines. According to the Filipino Inventor's Society, there are about 3000 patent holders and intellectual property exponents nationwide. Despite this number, there is not much recognition coming from the Filipinos themselves as some of the inventions that are considered useful are not really used commercially in the Philippines.

In lieu of this, the Philippine Government has provided laws on promoting and protecting local inventions. Among these laws are the Investors and Invention Incentives Act (RA 7459), Philippine Inventors Incentives Act (RA 3850) and the Intellectual Property Code of the Philippines. These laws are created in the belief that there are linkages among the development of science and technology, particularly the technological advancement through inventions, with national economic development.

This paper aims to prove if there is a significant implication of local inventions to national development in the context of the Philippines. As well as to analyze the current situation of the local inventions in the Philippines and the concepts to which it revolves such as the laws governing patents and intellectual property.

Today local inventors and inventions alike are slowly decreasing due to several problems that they encounter while in the process of inventing. These problems to name a few are; lack of exposure from the media, lack of proper implementation of laws and policies regarding inventors and

inventions, the need for more awareness and information regarding patents and the commercialization process. The numerous problems that an inventor encounters are what hinder him from potentially affecting national development and highlighting the innate talents of a Filipino from both the local and foreign market.

According to Carmen Peralta, Director of the IPO Information, Documentation and Technology Transfer Bureau, “ if only given the needed exposure, inventors would be inspired to work harder that would eventually translate to more patents.” The short number of patent applications and the much needed lack of support from the media in terms of recognition and endorsement is a reason for immediate action on both the government and the media. The lack of public exposure is what keeps local inventors away from possibly inducing technological change in national development.

B. STATEMENT OF THE PROBLEM

This study will answer the main problem: How can local inventions induce technological change for National Development? In answering the main problem several sub-problems or sub-questions needs to be accounted first.

- a) What are the current issues regarding local inventions?
- b) How does the government support local inventions?
- c) What model is necessary to analyze local inventions, technological change, and national development?

C. HYPOTHESIS

Local Invention:

Ho: Government support does not contribute to the development of local invention

H1: Government support contributes to the development of local invention

National Development:

Ho: Local Inventions has no significant implication to National Development

H1: Local Inventions has a significant implication to National Development.

D. THEORETICAL FRAMEWORK

In this paper we used one of the first frameworks in comprehending science and technology which is the Linear model of innovation (Godin, 2006) in compliance with Vernon W. Ruttan's study entitled; Usher and Shumpeter on Invention, Innovation and Technological change*1959.

In line with the study of Ruttan, he assumed that most of the social scientist follows a certain sequence in which invention, innovation and technological change are ordered in a logical sequence (Ruttan, 1959).

Inventionf Innovationf Technological Change

After generalizing the proper sequence assumed by most social scientist in the past, he then solved the terminological problem between invention, innovation and technological change by synthesizing two prominent studies in linear model of innovation by Usher and Shumpeter. V. W Ruttan

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insinuated a fusion of A. P. Usher's steps in the invention process (Usher 1954) and Schumpeter's concept of innovation (Godin, 2006).

Shumpeter distinguishes invention from innovation.

“ Innovation is possible without anything we should identify as invention, and invention does not necessarily induce innovation, but produces of itself ... no economically relevant effect at all. 6”

According to Ruttan, Schumpeter's definition of innovation is in terms of a change in the form of the production function (Ruttan, 1959).

“ We will now define innovation more rigorously by means of the production function.... This function describes the way in which quantity of products varies if quantity of factors vary. If, instead of quantities of factors we vary the form of the function, we have an innovation. 7”

Ruttan eliminated the distinction between invention and innovation as he discusses Usher's steps in invention process but incorporated the idea of defining innovation by means of production function. This is where the synthesis came about (Ruttan, 1959).

The definition of invention by Usher is in terms of “ new things” that require an “ act of insight” going beyond the normal exercise of technical or professional skill (Ruttan, 1959).

“ Inventive acts of insight are unlearned activities that result in new organizations of prior knowledge and experience. 6 Such acts of insight frequently emerge in the course of performing acts of skill, though

characteristically the act of insight is induced by the conscious perception of an unsatisfactory gap in knowledge or mode of action. 7”

In the Chapter IV of the revised edition of A History of Mechanical Innovations, Usher was said to discourse on the occurrence of one’s inventions in contrast with the performance of acts of skill by the use of cumulative synthesis (Ruttan, 1959). With this discussion, Ruttan concluded that it is more applicable to give the definition of invention as a subsection of innovation and shifting Usher’s description of invention to innovation-“ Indeed, it would be more in line with both popular usage and the terminology of other disciplines to use the term innovation to designate any “ new thing” in the area of science, technology, or art” (Ruttan, 1959).

The definition of technological change used by students of productivity and technological change is said to have a close similarity with the definition of innovation provided by Shumpeter. Compare, for example, a recent definition by Solow with the above quotation from Schumpeter. (Ruttan, 1959).

If Q represents output and K and L represent capital and labor in “ physical” units, then the aggregate production function can be written as:

$$Q = F(K, L; t)$$

the variable t . . . appears in F to allow for technical change. I am using the phrase “ technical change” as a shorthand expression for any kind of a shift in the production function.” 9

According to Ruttan, the only problem with this definition of technological change is that it does not emphasize the specific process of technological change. Thus a need for a proper analytical definition is a must.

After providing a clear distinction between invention, innovation and technological change, Ruttan gave three prominent suggestions in this study namely; first one must not attempt to provide an analytical definition of invention and depict it as a subset of technical innovation which is patentable. Second, the extension of the definition of innovation is needed so much as to cover the entire range of processes by which “ new things” emerge in science, technology, and art. Third, The use of technological change in the functional sense-” to designate changes in the coefficients of a function relating inputs to outputs resulting from the practical application of innovations in technology and in economic organization” (Ruttan, 1959).

In compliance to the study of Ruttan, the linear model of innovation will be use as suggested in Ruttan’s study. “ The linear model of innovation starts with basic research, then adds applied research and development, and ends with production and diffusion” (Ruttan, 1959):

Basic research f Applied research & Development f (Production and)
Diffusion

In function: Innovation = Basic research+Applied research &
development+Diffusion

It has been noted that the source of this linear model has remain indefinable because it has never been documented. Despite its widespread use, there

are still many criticisms that surround the theory and even proclaiming it as a dead model. The long survival of the model despite regular criticisms is because of statistics (Godin, 2006).

Overall, we will be using the definitions and suggestions provided by Ruttan. We will not provide an analysis on invention. We will use the linear model of innovation for the analysis of innovation as suggested by Ruttan-extend the concept of innovation to cover the entire range of process by which “ new things” emerge. We will use the provided definition of the technological change, by Solow, in Ruttan’s study in order to analyze invention to national economy.

The linear model of innovation in compliance to V. W. Ruttan study of 1958 is a proper framework for this paper. This paper analytically analyzed innovation and technical change of the Philippine local invention as suggested by Ruttan. Also, the simpleness of the linear model can be a proper starting point in analyzing insufficient data availability such as the condition of the Philippine local invention.

E. EMPIRICAL FRAMEWORK

In this paper we attempt to analyze innovation, as defined in Ruttan’s 1959 study, and technological change of Philippine local invention in the year 1900-2010. In analyzing innovation we will use the linear model of innovation particularly the one that was defined by Ruttan in his 1959 study.

Linear model of innovation

$$X = f(B, A, D)$$

X: Innovation

B: Basic research

A: Applied research

D: Diffusion

Empirical framework

$$X = f(D, E, F, G)$$

X: #of local invention

D: # of scientist and engineer

E: Annual R&D expenditures/ government allocated funds

F: # of clients/beneficiaries

G: # of commercialized local invention

In analyzing technological change we will use Solow's function for technological change.

Solow's Technological change function

$$Q = F(K, L; t)$$

Q: Aggregate output

K: Capital

L: Labor

t: Technical change

Empirical Framework

$$Q = F(K, L, I; t)$$

Q: GDP

K: Investments

L: Labor force

I: Local invention

t: Technical Change

F. SIGNIFICANCE OF THE STUDY

Invention and innovation have proven to be crucial components for the development of modern societies (Marton-Lefèvre, 2003). This study is important therefore in order to analyze the current status of the local inventions in the Philippines and its linkage to national development. Since it has always been based on the presence of necessity that inventions are created, there is always a need and a demand for inventions especially for the less developed countries that are in the process of industrialization. However, this demand for local invention is not quite evident in the Philippine market. This study therefore aims to analyze the current problems that local inventions face and analyze the effectiveness of the innovation system that we have in the Philippines. According to Johnson et al, the history and development of the innovation system concept indicates that it can be useful for analyzing less developed economies (Johnson, Edquist, &

Lundvall, 2003). This paper therefore, is significant in order for us to become aware of the current situation of the local inventions, its history and development in the Philippines in order to create solutions to its problems. This study is important also for us to know the impact of local inventions to our economy and be able to provide basis on the applicability of the concept that inventions, being the source of technological change, can lead to national development.

F. SCOPE AND LIMITATION

The study is limited to the local inventions that were given residential patent grants. This is to make sure that the local invention passed the criteria of IPPHIL and WIPO. This means that the local invention complies with the standard definition of invention by these two patent offices. The scope of the study in terms of commercialization process only includes local inventions that were licensed, venture and assigned. These three are the basic ways to commercialize an invention. The analysis of current issues in local inventions will be limited to the data provided by the annual report of TAPI-Technology application and promoting institute, the official government institute that helps local invention to be commercialized. The timeframe of the study is from 2000-2010. This is due to the lack of availability of some data's regarding local inventions. The area of the study is in the Philippine setting. Local inventions created by a Filipino with patent grant.

CHAPTER 2

REVIEW OF RELATED LITERATURE

I. CURRENT SITUATION OF LOCAL INVENTION

“ Local inventions comprised only 1. 2% of over 8, 000 patents granted by the IPO (Intellectual Property Office) of the Philippines over the last six years, indicating the lack of awareness on the value of IP rights” (Flores, 2007)

Currently there is a lack of patent applications as stated by the IPO by Filipino inventors who wish to patent their inventions, because of lack of awareness on the value of such patent rights, inventors tend to not apply at all. The lack of knowledge of Filipino inventors on such patent rights and exclusive incentives are one of the reasons of the small percentage of patent applications. “ The number one reason is the level of awareness on the availability of support services being provided by the IPO” (Gefty, 2011)

In order to solve the current problems of the Philippine local inventors, there have been laws existing to support and encourage the local inventions.

One of which is the Republic Act 7459, or the Investors and Invention Incentives Act of the Philippines whose aim is to give priority to invention and its utilization on the country’s productive systems and national life; and to this end provide incentives to investors and protect their exclusive right to their invention, particularly when the invention is beneficial to the people and contributes to national development and progress. Some of its provisions are to give cash rewards amounting up to Php100, 000. 00 to the chosen outstanding inventors They also give tax incentives and exemptions as well as invention development assistance funds through the Technology Application and Promotion Institute in the amount of at least twelve percent (12%) of the annual operations fund of the Institute from donations, bequests, and other sources, public, private or domestic or foreign, for assisting potential or actual inventors in the initial experiments and

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prototype development and other inventor-development related activities of invention or innovation.

Included in Article 5 of RA 7459 is the Invention Guarantee Fund created by RA no. 3850. A continuing annual appropriation in the amount of not less than Ten Million Pesos (P10, 000, 000. 00) shall also be provided for this purpose in the annual budget of the Department of Science and Technology. The Fund shall also be used for special financing programs for Filipino inventions pursuant under this Act. This also includes Financial and Loan Assistance from Government Banks of not more than Two-hundred Thousand Pesos (P200, 000. 00). These are Loan assistance for the commercial production of an invention, either locally or for export and duly certified by the Filipino Inventors Society and the Screening Committee created under Section 4, shall be extended by government banks: Provided, That said invention meets the criteria that would enhance the economy of the country such as profitability and viability, dollar-earning capacity, and generation of employment opportunities for Filipinos: Provided, further, That said loan shall be guaranteed by the IGF.

II. THE PROCESS OF INVENTION

It has been noted that we know in our hearts what an invention is and the idea of “ invention” is said to have assumed a status like that of “ consciousness” or “ mind,” something we can express of but not quite articulate (Arthur, 2005). WIPO provided a definition of invention such as; a new product or process that solves a technical problem. Invention is an example of an intellectual property. Under the intellectual property, there

are two categories namely; industrial property and copyright. Invention is categorized under industrial property. An invention must be patented in order to protect ones intellectual property rights. An invention must, in general, fulfil the following conditions to be protected by a patent. Before it can be patented, one invention must abide by the requirements of WIPO such as; “ It must be of practical use; it must show an element of “ novelty”, meaning some new characteristic that is not part of the body of existing knowledge in its particular technical field and must show an “ inventive step” that could not be deduced by a person with average knowledge of the technical field” (WIPO, 2000).

It has been emphasize that the single most important element of long term growth is the innovative activity (Rosenberg, 2004). This Innovative activity can be in terms of organization or production. Focusing on production, most of us will think about technological progress created by inventions. A handful of readings will indicate how important inventions are to our economy; in most of the developed country have economic indicators relating to technological progress. So much have been said about how important inventions are but only some will tell about how it came about.

In the study conducted by Ruttan, he cited a study of Usher; recognizing and agreeing with the statements. In Usher’s Chapter IV of the revised edition of A History of Mechanical Innovations, he identifies three general approaches on how invention came about; the transcendentalist, mechanistic process and the cumulative synthesis (Ruttan, 1959). According to Usher the transcendentalists ascribe the occurrence of invention to the occasional

inspiration of a genius who from time to time realizes a direct knowledge of
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indispensable truth through the exercise of intuition. While the Mechanistic process represents a new combination of individual elements that accumulated over time. This process came about due to necessity and that the inventor is just an instrument of the processes. Among the three approaches on how invention came about, Usher believed and agreed with the cumulative synthesis-major inventions materialize through cumulative synthesis of simple inventions, each of which entails an individual “ act of insight.” In case of individual invention, four steps were outlined: perception of the problem, setting the stage (the gathering of elements and data needed for the construction of the possible solution), the act of insight (the establishment of the solution to the problem) and critical revision (can be comprehended and working) (Ruttan, 1959). According to Usher, these three approaches are the possible logic behind how inventions are made, but at the same time criticizing the first two approaches and agreeing with the cumulative synthesis.

The other way of looking on how invention came about is through a sociological and economical perspective. One author noted that novel technologies are influenced by social needs; they arise from experiences outside the standard domain; they often originated in cultures that reinforce risk; they retort to economic incentives (such as demand or factor price changes); they merge with the accumulation of scientific knowledge; they start better with the interchange of information which is often mediated by networks of colleagues (Arthur, 2005). Overall, the process of invention is compound, lengthy, determined, knowledge generating, boundary-

transgressing, and notable for a number of other features (THE LEMELSON-MIT PROGRAM, 2004).

Besides looking in the invention process per se, invention will not be around if not because of its creator, the inventor. There are a number of abilities and disposition that can be attributed to the production of invention such as; “ resourcefulness, resilience, a commitment to practical action, nonconformity, passion for the work, unquenchable optimism and many more. Skills and ability examples: mental flexibility, alertness to practical problems and opportunities, ability to match one’s talents with the problem, using a tool kit of effective ways to conceptualize and break down the problems, and self-knowledge helpful in managing one’s endeavours” and etc (THE LEMELSON-MIT PROGRAM, 2004).

After knowing the process of invention and sample skills of inventors, we must recognize the importance of R&D in the invention process. As of today most of invention does not come from an individual but by groups such as research institute financed by the government or private firms. These institutes are normally called research and development (R&D) institutes. According to OECD definition, Research and development is a term used in covering three activities: basic research, applied research, and experimental development. It has been said that the common role of R&D is to encourage innovation and technology by improving the ability of firms to learn about advances in the leading edge (‘ absorptive capacity’) (Griffith, 2001).

III. THE PROCESS OF COMMERCIALIZATION

It is a given fact that the main goal of invention is to solve a problem by technical process with this the beneficiaries of the invention will be satisfied. But how about the inventor, aside from the sense of achievement and acknowledgement what can he benefit from his invention? Here lies the emphasis on the commercialization process of invention.

There are different ways to commercialize ones invention; either through licensing, self-venture or assignment. It has been noted that In order to reach the market, you have to find someone who can sell your invention or sell it yourself (National Renewable Energy Laboratory, 1999).

According to WIPO, Licensing occurs when a licensor grants exploitation rights over a patent to a licensee. A license is also a legal contract, and so it sets the terms and condition of the exchange of rights including other important details in using or producing one's invention (Mendes, 2000).

Many inventors undertake licensing because of the huge amount of money that they can acquire and the level of responsibility is lower than using or selling your own invention (National Renewable Energy Laboratory, 1999).

There are considerable pros and cons regarding the licensing process. Here's the summary: the pros; licensing multiplies the resources to develop your invention, you may make some money and you may make it soon, and licensing frees you to do something else. The cons; you lose control of the technology; your own involvement is reduced, finding the right licensee is tough and protecting your interests is crucial (National Renewable Energy Laboratory, 1999).

It has been noted by the National Renewable Energy Laboratory in United States that venturing or commercializing your technology by yourself is probably the hardest path to take especially if one does not have a background about business and marketing. It requires a lot of business skills and connections in order to successfully commercialized ones invention. There are also pros and cons with the use of this process. The pros; running a company can be exciting, in the long run, you may make a lot more money and it is your company and you control it. The cons; it's risky, resources remain limited, you'll be working and working and you probably won't make much money for quite a while (National Renewable Energy Laboratory, 1999).

In an assignment involves there is a trade and transmission of ownership of the patent by the assignor to the assignee (Mendes, 2000). It is probably the easiest way to commercialize an invention but in return the ownership of the patent does not belong to you and it is irrevocable. If you want a lump sum of money in an instant from your invention, this is probably the appropriate commercial process for you to use.

Before an invention undergoes the process of commercialization, there are general prerequisites that are needed to be accomplished. First, it must be working, specifically an engineering prototype. Second, you should have a market analysis-you ask the basic questions in economics such as who, how, when, where and how much to produce. In addition, you need to know different market channels where your invention could reach. Last, a written plan-same as writing a business plan (National Renewable Energy Laboratory, 1999).

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There are two things that should be prioritized in order to lessen ones problem in the process of commercialization. An inventor must acknowledge the cost and sources of capital. Cost can be in the forms of money, time and personal life, while sources of capital can in forms of debt capital, government funds and equity capital (National Renewable Energy Laboratory, 1999).

Overall, it seems that the commercialization of one's invention is one of the goals of an inventor. It is one of the preferred end points of such activity. A report emphasized the importance of commercialization of an invention and proclaimed it as a reward to the inventor. It also included the importance of relationship with different professions in order to make one's invention into the market-“ What good is an invention if it never makes it to market, or for that matter, I it never rewards its creator? Invention does not end with coming up with a new device or new process. It takes an equally adroit tenacity to form the relationships that will make the invention payoff” (McPherson, 1995). “ Certain relationship must be established by the inventor with different business development professional in order to try making its invention into the market; maybe a patent attorney, market researcher, business development pro or perhaps an invention-marketing group” (McPherson, 1995).

IV. Government Support in Local Invention

There are many government agencies as well as non-government organizations that support local inventions.

Under the supervision of the Department of Science and Technology, is the establishment of the Technology Application Promotion Institute or TAPI. Its primary responsibility is to promote the commercialization of technologies and market the services of other operating units of the department (TAPI, 2008). Among others, TAPI also administers the Invention Development Assistance Fund for the initial experiments and prototype development and other invention-development related activities. Through this fund, TAPI has managed to conduct various programs that raise the level of awareness of various clients in the areas of technology application and utilization.

Among these programs is the Academe/Industry Prototype Development Assistance Program which provides financial support for the fabrication and testing of commercial prototypes, the DOST Exposition and Fairs Program that promotes and exhibits technology materials, ideas and information, the Technology-Based Enterprise Development Assistance Program which gives financial assistance to technology-based micro, small and medium scale enterprises, the Investor's Forum Program which brings together technology operators and investors to create actual business ventures, and many other programs that promotes and supports Philippine local inventions (TAPI, 2008). All these programs lie under the Technology Information and Promotion Division.

Among various programs of the TAPI caters to agricultural enterprises, manufacturing firms, students and non-government organizations through its Investment and Business Operations Division. TAPI also extends its assistance to agricultural-based enterprises through the Consultancy for Agricultural Productivity Enhancement (CAPE). It also assists small and <https://assignbuster.com/the-national-development-of-the-philippines-commerce-essay/>

medium scale enterprises in manufacturing to attain higher productivity through the Manufacturing Productivity Extension (MPEX) Program and the Venture Financing Program. TAPI also caters to students, young professional in developing their entrepreneurial competencies through the Small Enterprise Technology Upgrading Program – DOST-Academe Technology-Based Enterprise Development (SETUP-DATBED) Program. DOST also supports technology transfer through the Science and Technology volunteer Pool Program (STEVPP). This program basically provides experts and scientists to its interested clients in the various regions and municipalities in the Philippines in order to provide them technical assistance on technology commercialization (TAPI, 2008)

Lastly is the Invention Development Division (IDD) who is mainly responsible for providing financial assistance to Filipino inventors by upholding the intellectual property system as well as the business development of inventions and technologies (TAPI, 2008). They basically provide funding assistance for the local inventors in their activities such as securing intellectual property protection, industrial applications in private enterprises, manufacturing and testing of their inventions, developing their invention as an enterprise commodity and even travel assistance. They are also given tax and duty exemptions through an endorsement to the Bureau of Internal Revenue and the Department of Finance.

Inventors are also encouraged to showcase their inventions through the National Invention Contest and Exhibits (NICE) wherein they can have cash incentives or prizes amounting to P150, 000. 00 as well as WIPO Gold Medals and certificates. This contest is held annually and is open for all local
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inventors in the academe (high school and college level) as well as those in the private sectors.

Among the other agencies concerned in the promotion of local invention and the protection of intellectual property rights are the Filipino Inventors Society and the Intellectual Property Rights Office of the Philippines.

V. Cultivating Technological Innovation for Development

“ Development or innovation in society of technologies, such as information and communication technologies should be self-cultivated rather than imported.” (Corea, 2000) Based from the research paper there is a need for developing countries to improve or focus on achieving a technological adoption particularly on Information Communication Technologies to reap its benefits. There have been multiple research disciplines to support such study particularly; behavioral notion on development, concepts of change, theoretical formulations. The paper applies these ideas for understanding the macro-phenomena of national development in terms of technological innovation

Technological change as defined in the paper is “ any incremental or radical changes in the application of problem-solving knowledge to the production process, resulting in increased efficiency, either in the form of a product or service produced with lower costs or in the form of a qualitative improvement in a product or service.”