

Technology Acquisition Model In National Pharmaceutical Industry

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Abstract

Rapid development in the current global economy encourages the Pharmaceutical industry to excel in the competitive global market. Apart from factors that determine the quality, with a very competitive market the ability of the pharmaceutical industry strategy to win competition in order to expand the global market becomes the determining factor. This encourages the company to develop a real strategy to meet the future demand, one of them by improving innovation. The purpose of this literature study was to identify the effect of innovation to improve competitiveness in winning solutions to achieve improvement in the company's performance. The literature study results showed that innovation on product development performed may affect the competitiveness of pharmaceutical company. Through innovation it is gained new ideas and improvements to the gap encountered in the company. Innovation generated in the form of basic research and product development which could encourage the creation of a new product needed by the market. As a case study therefore methodology used in this study is descriptive and explanatory methods. The value of this literature study is to improve the global competitiveness so as to improve the company's performance in winning the global competition.

Keywords : Management, Collaboration, innovation, Pharmaceutical Industry

INTRODUCTION

Pharmaceutical industry in Indonesia is one of the industries that develop rapidly whose market continuously expands and is the largest pharmaceutical market in the Association of South East Asian (ASEAN) area. The grouping study report of State Owned Enterprises (SOEs) of Pharmaceutical Sector stated that Indonesian pharmaceutical market is an important market .. (Mandiri Sekuritas, 2011)

The innovative discovery of new products boosts global pharmaceutical growth. License of patented drugs and off-patent drugs may encourage the continuity of national pharmaceutical market growth. Indonesian pharmaceutical market recorded a rapid growth that equals to the growth of the global pharmaceutical market. It is important for the national pharmaceutical industry to prioritize the discovery of new pharmaceutical products. As one of the efforts to improve competitiveness, national pharmaceutical industry shall have a



strategy mainly in suitable product innovation to be able to produce new products. The processes of research and development of new products take a long time, for example biomedical products take at least 12 (twelve) to 15 (fifteen) years as illustrated in Figure 1.2 as follows:

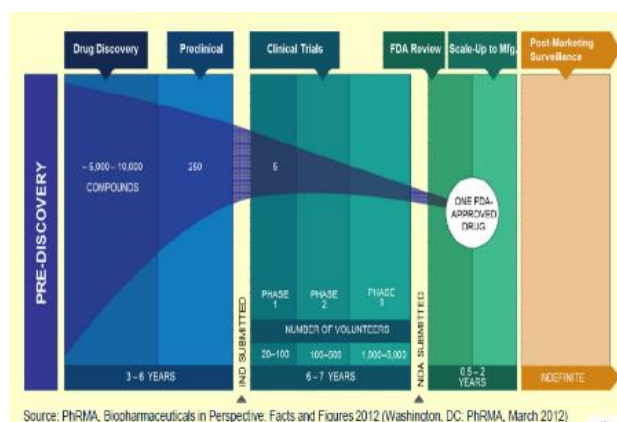


Fig. 1. Research and development process of new products.

As one of the efforts to improve competitiveness, national Pharmaceutical Industry shall have correct innovation strategy to innovate the products. Regional and global pharmaceutical growths are driven by discovery of innovative drug products (patented drug). License of patented off-patented drugs is able to boost the continuity of national pharmaceutical market growth.

Innovation improvement implemented by the pharmaceutical industry has not shown improvement of new products discovery by national pharmaceutical industries. It is indicated by the Intellectual Property registration in Directorate General of Intellectual Property (Directorate General KI) and the Ministry Law and HAM of the Republic of Indonesia that is relative small including the discovery in the pharmaceutical field.

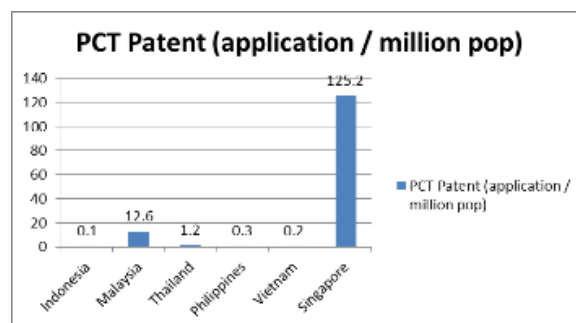


Fig. 2. PCT Patent Application.
Source : Global Competitiveness Report , 2014 – 2015

In graph 1.2, in national scope, Indonesian innovation pillar compared to other ASEAN countries is still low, it is demonstrated by the data of ASEAN Ratio Patent Registration 2013. National pharmaceutical industry competitiveness will be hindered by increasingly decrease of active pharmaceutical ingredients discovery new chemical entities, fewer off-patent products. However, some developing countries have significantly improved their industrial ability for the last 50 years, such as India and China.

LITERATURE REVIEW

2.1 INNOVATION

Innovation according to Philip C. & Olga M.: Innovation is the stage of the first application of the existing knowledge within production. While Benoit Godin in the journal Innovation: The history of a category, Project

on the Intellectual History of Innovation, 2003 stated that the discourses on innovation have been Generally of three kinds: innovation as a factor for change in society, innovation as progress, and innovation for its own sake, such as personal recognition, prestige or professional identity.

Innovation by Peter Drucker is an effort to create changes aiming and focusing in an economic or social potential. While Theo Papaioannou, Andrew W., Julius M. and Dinar K., stated that The role of industry associations in shaping policy through various lobbying activities is well established. That places industry associations as key intermediary actors that facilitate knowledge exchange and institutional capacity building, particularly in the context of developing countries where limited institutional capacities and substantial knowledge gaps can limit both innovation and development.

The succeeded innovation according to by Cassiman B. and Veugelers R (2001) is affected by the integration of knowledge that is applied innovation implementing process. The success of developed countries to improve science and technology mastery is caused by the ability of the countries to synergize institutional development of science and technology resources they have with other factors and system nationally. It is shown by their competitiveness in the middle of globalization climate when they are able to be on the top ranks in the global competitiveness index as reported by World Economic Forum (WEF). Building a national synergy is the key word to be able to survive and compete in the midst of globalization. Globalization process has encouraged nations involvement in international competition as well as in the competition for market, technology, expertise and investment. WEF reviewed Global Competitiveness Index (GCI), which includes 12 pillars to compare countries competitiveness, such as institution pillar, infrastructure, macroeconomic environment, health and primary education, higher education and training, efficiency of commodity markets, labor market efficiency, financial market development, technological readiness, market quantity, business sophistication and innovation. In the pharmaceutical field, Ariana et al (2014) stated that the companies from different countries have made the effort to contribute to improve global health through innovative drugs.

In technological innovation aspect, Indonesia is in forty six rank of one hundred forty two countries in 2011 - 2012 in which Indonesia was in forty four rank. Of the twelve pillars, the pillars representing science or technology and technological readiness are weak, which is in ninety four rank. The technological readiness pillar, within 2008 – 2012, hardly shifts from the nineties rank.

The result of various studies that have been conducted by experts demonstrated science and technology contribution will be very great if Research & Development activities can synergize and focus on industry, government and society needs. For example, Japan, Netherlands and Germany. They build industries at the same time build their economy and competitiveness. It is an accurate way to contribute to their innovation system.

The innovation dimension comparison from a variety of sources is compiled, as the material to construct innovation dimension, as shown below:

Table 1: Comparison of Varibael Innovation Dimension

Name	Variable Innovation Dimension	Constructs
Cassiman B. and Veugelers R (2001)	Knowledge integration	
	a. Product Innovation versus Process Innovation	
	b. Radical Innovation versus Incremental Innovation	
Schilling (2005)	c. Competence Enhancing Innovation versus Competence Destroying Innovation	Product Innovation
	d. Architectural Innovation versus Component Innovation	
Tidd, Besant and Pavid (2005)	a. Product Innovation process	
	b. Position	
	c. Paradigm	



Name	Variable Innovation Dimension	Constructs
Ahmed and Shepperd (2010)	a. Product Innovation b. Process Innovation c. Strategy Innovation	

2.1.1 Product Innovation

According to Manzano, Kuster and Vila (2005), product innovation is the output of an organization in the form of a product that can be seen and enjoyed, for example, new drugs, electronic appliances etc. There are eight steps of product innovation, they are: Basic Research, Applied Research, Technology Implementation, Production, Marketing, Proliferation, Technology enhancement.

Product innovation specified by Tidd, Bevand and Pavid (2005), is the creation of a new product for an organization, introduced to market through the utilization and commercialization, existing technology integration and is a patterns of thought process. Product innovations include creation of ideas, acquisition of important knowledge and transformation into a hardware or useful procedures and introduce them to society and their dissemination.

Product innovations according to Cooper, Robert in book of Kahn, Kenneth (2013), can be in the forms of new or development existing product or services to obtain better features / functionalities or than previous one.

In accordance with construct description, innovation is formulated in the following dimensions and indicators:

Table 2: Construct Dimension and Innovation Variabel Indicators

Dimension	Indicator
Product innovation	1. New Product
	2. New Product
	3. New Product

2.1.1 Competitiveness

The definition of Competitiveness according to Spulber (2004) is the difference between the value created by the company compared to the value created by competitors, in which the total created value for customers, suppliers and company owners should be more than the total value created by competitors. In the strategic management, sustainable competitive advantage is relative company's advantage against its competitors. Source of the advantage may be something different done the company and is hard to copy.

According to Walker (2009), competitive advantage can be obtained from the value of something produced and cost factor, it also reflects superior economic performance compared to those of competitors. To protect such different value, a mechanism that is hard to imitate must be created. To achieve a sustainable competitive advantage, a company must achieve a dominant marketing performance.

A company strategy shall be directed to improve competitiveness and win the competition in a target market. A competition will be won if a company's strategy is able to create a competitive strategy that has competitive advantages. As stated by Porter in book of Walker (2009), competitive strategy explains positioning in a competitive strategy structure and use five forces to analyze the competitive advantage in industry. The theory suggests that a company shall choose an appropriate position in an industry. Porter's theory is a combination of objectives that are tried to achieve by company policy tools used to achieve the objectives or finding a favorable position in a market as a competitive place

To win the competition, a company may create a basic competitive advantage, such as differentiation or new product. As already known, differentiation strategy will put the company uniquely to meet specific customer needs. Generally, the company will provide important value for consumers so that the consumer is willing to



pay a premium price. A company shall always look for differentiation methods that produce greater premium price than the cost differentiation.

Marcus (2005), suggested that sustained competitive advantage can be obtained from timing and positioning, company collaboration (merger, acquisition), globalization and innovation, which in turn will get continuous repositioning. While the competitiveness itself is obtained from the Cost advantage (similar product at low cost) and differentiation advantage (unique product at premium price). Meanwhile, according to Collis and Montgomery (2005) competitive advantage is obtained when a company diversifies the market existing products.

Business mission, goals and strategies to identify areas of product market are management consideration. Business scope and purpose business are the basis for product planning. Types of companies may assist determining scope of new product idea considered by a company. Top management can define the scope of new product idea considered by the company. Factors that contribute to new products success: Product fit with market needs, Product fit with internal functional strengths, Technological superiority of product, Top management support, Use of new product process, Favorable competitive environment and Structure of new product organization.

In accordance with the analysis on a variety of concepts, then the construct of Competitiveness will be seen considered, to Marcus and Collis, it is better cost and product quality than those existing in a market and according to Jouni, Midler and Gauler, where time is taken, or when the new products is released earlier, that is time to market. Then the competitiveness dimension comparison from a variety of sources is compiled, as the material to construct Competitiveness dimension, as shown below:

Table 3: Comparison of Dimensions Competitiveness Variable

Name	Dimensions Competitiveness Variable	Constructs
Walker (2009)	a. value of something produce and cost factors b. superior economic performance compare those of competitors	
Kottler & Keller (2009)	a. product differentiation b. services differentiation c. employees differentiation d. Image differentiation	a. Quality b. Cost c. Time to Market
Marcus (2005)	a. Cost advantage (similar product at low cost) b. differentiation advantage (unique product at premium price)	
Collis and Montgomery (2005)	Diversification among existing product market	
Jouni, Midler and Galer (2003)	Time to Market	

In accordance with the analysis on a variety of concepts, then constructs of Competitiveness in the national pharmaceutical industry, are Quality, Cost and Time to Market. In accordance with description, the construct is formulated in a dimension and indicator as follows:

Table 4: Comparison of Dimensions Competitiveness Variable

Dimensions	Indicator
Quality	Product Quality
Cost	1. Cost efficiency 2. Price
Time to Market	Launching time



2.1.1 Company Performance

Organizational performance by Haris and Ogbonna (2011) is a success or achievement measurement achieved by an organization which is measured every certain period of time and can be measured with the following dimensions: (a) Financial factor, it is a factor related to financial companies such as the company's profitability, sales growth and market share and (b) Non-financial factor, it is a factor that has nothing to do with finance, for example customer satisfaction and customer loyalty

The company performance according to Aaker (2004), can be measured by measuring the sale volume, market share and profitability. Meanwhile, according to Walker, Boyd and Larreche (2003) company performance is a description of company objective achievement through improvement of sales and market share. Then the Company Performance dimension comparison from a variety of sources is compiled, as the material to construct Company Performance dimension, as shown below:

Table 5: Comparison of Definitions Variabel Company Performance

Name	Dimensions Variable Corporate Performance	Constructs
Haris and Ogbonna (2011)	a. Company profitability b. sales growth c. market share	Profitability market growth market share
Aaker (2004)	a. sales volume b. market share c. profitability	
Walke, Boyd and Larreche (2003)	a. sale increase b. market share	
Wheelen and Hunger (2010)	a. market share b. market growth c. profitability	

In accordance with the analysis on a variety of concepts, then the constructs of the Company's Performance in the national pharmaceutical industry are market share, market growth or an increase in sales volume (market growth) and profitability. In accordance with the description, the constructs are formulated in the following dimensions and indicators:

Table 6: Dimension Construct and Indicator of Company Performance

Dimensions	Indicator
Profitability	Profit
market growth	Market Growth
market share	Increased market share

3. RESEARCH METHODOLOGY & ANALYSIS

3.1 Research Framework

In accordance with problem identification, research objectives and research method, then it is produced a relationship model between variable that is a solution for pharmaceutical company performance problems as materials for solving the problems. The variables are expected to create a solution variable that can be used to develop action plans and rise the model of competitiveness and performance of the national pharmaceutical companies.

Innovation can also affect how the company utilizes its resources. Innovation is influenced by the integration of knowledge applied in the process of innovation. Corporate innovation has a close relationship with regulation. Companies that drive innovation are heavily influenced by regulation, whether regulation related to Intellectual Property or government incentives that can accelerate an innovation in pharmaceutical companies. Innovation

has a close relationship with the mastery of technology. Innovative companies are able to master new technologies to produce a product that has value in the market and has a close relationship with competitiveness. Companies must have the mastery of technology to be able to win competitiveness. Companies that have the ability to mastery of technology, then able to have competed. Technological mastery has driven competitiveness through innovative new product development and technology transfer can drive the competitiveness of enterprises. Tidd, Besant & Pavid (2005), proves that business regulation impacts on the use of company innovation also resulted in research stating that government incentives affect investments that can drive corporate innovation. Regulation can inhibit or stimulate technological change. This relationship depends on the design of technology regulations and the instrument of choice of regulatory policy. Thus the new regulations will affect the technology as well as the influence of technology trends and technology adoption on the implications of regulation. Company resources have a close relationship with regulation. The company must have sufficient resources to meet the regulations governing its business. Regulation can also affect how the company utilizes its resources. The description of the study is presented in Figure 3.

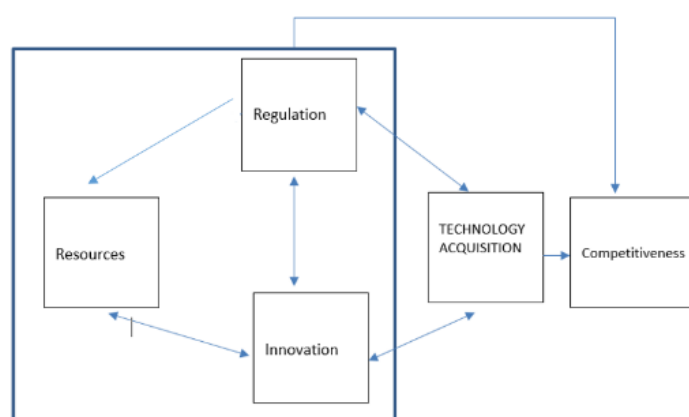


Fig. 3. Path Diagram of Research Model

Based on problem identification, research objectives and research methods that have been described, then it will be obtained the relationship model between variables that are the solution of pharmaceutical companies' performance problems as the material to solve the problem.

3.2 Methodology

In accordance with the research objectives to be achieved, then it is used a descriptive research and verification research whose objective is to obtain description on natures and characteristics of variables that are studied as well as to understand and analyze the relationship between variables through hypothesis testing. In accordance with the type of this research then this research uses descriptive and explanatory methods. Principally, verification research will test the hypothesis validity that is implemented through data collection in the field, in which in this study the test is to determine whether product innovation and technology strategy and the collaboration of product development have the effects on competitiveness increase and performance improvement on national pharmaceutical companies.

The variables are expected to produce a variable solution that can prepare the operating strategy and action plan. From the research result consisting of interviews and observations and hypothesis testing using PLS analysis tool, it is expected that national pharmaceutical company performance improvement model can be obtained.

3.3 Policy Analysis

The populations of this study are national pharmaceutical companies who are active in pharmaceutical company association, totally 180 companies, the data are collected by survey and interview with leaders and managers of the national pharmaceutical companies to represent the company's board of directors. The analysis technique



used is a structural equation modeling with Partial Least Square Path Modeling approach (PLS-PM).

4. DISCUSSION

Benneth and Smith (2002) state that competitive advantage is an advantage achieved through superior customer value.

5. CONCLUSIONS

Objective formulation of problem solution of this study is the next stage of problem formulation. Furthermore, objective formulation can be measured and it is possible to identify solution variables. Innovation effect and research & development cooperation are measured as one of the potential variables that affect competitiveness and have the impact on company performance. To understand the effect on each of the variable, then this research is expected to measure four interrelated variables, namely innovation strategy and cooperative research & development variables as the independent variables, the competitiveness that still need testing as a full intervening or partial intervening and finally, the pharmaceutical company performance variable as the dependent variable. In this objective formulation, it is expected that innovation strategy and research & development cooperation for competitiveness and pharmaceutical companies performance can be seen.

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