



**INNOVATION FACTORS TOWARD ENHANCING
ORGANISATION PERFORMANCE:
A STUDY ON THE MALAYSIAN HEALTHCARE SECTOR**

NALINI A/P SUBRAMANIAM

MASTER OF SCIENCE IN TECHNOLOGY MANAGMENT

2018

**INNOVATION FACTORS TOWARD ENHANCING ORGANISATION
PERFORMANCE:A STUDY ON THE MALAYSIAN HEALTHCARE SECTOR**

NALINI A/P SUBRAMANIAM

**A thesis submitted
in fulfillment of the requirements for the degree of Masters of Science in
Technology Management**

Faculty of Technology Management and Technopreneurship

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2018

DECLARATION

I declare that this thesis entitled “Innovation Factors Toward Enhancing Organization Performance: A Study On Malaysian Healthcare Sector” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature :.....

Name :NALINI A/P SUBRAMANIAM

Date :.....

APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Masters of Science in Technology Management.

Signature :

Supervisor Name : ASSOC.PROF DR.JUHAINI BINTI JABAR

Date :

DEDICATION

This thesis is dedicated to loving memory of my father and beloved mother who always loved me unconditionally and constantly give me support and encouragement throughout the process. Without their blessings and encouragement, this thesis impossible to complete.

ABSTRACT

Healthcare sector one of the key economic driver and crucial sector in nation Gross Domestic Product (GDP) contribution. Healthcare sector in Malaysia consists with three main industries, Pharmaceutical, Medical device and Biotechnology. Malaysian government had segregates lumps of funds to evolve the healthcare industry in transition towards innovation economy by 2020. Currently Malaysian obtained capable infrastructure such as manufacturing plant and in house Research and Development (R&D). However, healthcare industry slow in modification and innovates business model which leads the healthcare industry left behind compare to other developing countries such as China and India. Moreover, most of major death caused in Malaysia were chronic diseases. Malaysia forced to export generic medicines from foreign market and government spend lump of funds on medicines and medical equipment export even on generic medicines. On the other side, Malaysia healthcare sector attract most of medical traveler with its traditional therapies and reasonable medical expenses. Malaysia have been as one of the medical hub in ASEAN countries, however the industry faces tough competition in terms of price and quality along with its neighbour countries. Recently a few scholar has has underlined factors that determined innovation in healthcare. However, there has limited empirical evidence proposing an innovation factors towards enhancing organization performance of healthcare in Malaysian context. Therefore, more research needed to address the antecedents of innovation practice in order to boost up an organization performance in healthcare sector. Limited studies on innovation factors in healthcare sector in Malaysian context leads the path to researcher to overview on innovation factors which could boost the organization performance in terms of profit, sales, market share, and export rate, number of patents and global entry of the firm. Hence, Healthcare industry have capability to increase innovation to the next level and simultaneously enhance the contribution of gross domestic product and export activity. This study have identifies top management support, market orientation and research and development (R&D) alliance as an innovation factors which tested over organization performance of the healthcare industry. This study has attempted to analyze the innovation activities in healthcare industry in order to understand the factors leading to innovation towards enhancing organization performance. A research model has been developed and empirically tested through survey with 330 companies as a sample size. This study obtained data from 95 companies and were analyzed through logistics and multiple regression using SPSS. The result of this study indicated top management support as a most significant factor which influence organization performance in the context of healthcare industry in Malaysia.

ABSTRAK

Sektor kesihatan adalah salah satu daripada pemacu ekonomi utama dan juga sektor penting dalam sumbangan negara Keluaran Dalam Negara Kasar (KDNK). Sektor kesihatan di Malaysia terdiri daripada tiga industri utama, Farmasi, Peranti perubatan dan Bioteknologi. Kerajaan Malaysia telah mengasingkan dana yang besar bagi industri kesihatan berkembang dalam peralihan ke arah ekonomi inovasi pada tahun 2020. Kini, industri kesihatan Malaysia memperolehi infrastruktur yang cekap seperti kilang pembuatan dan pusat Penyelidikan dan Pembangunan Walau bagaimanapun, industri kesihatan agak perlahan dalam pengubahsuaian dan memperbaharui model perniagaan yang menyebabkan industri kesihatan ketinggalan bandingkan dengan negara-negara membangun yang lain seperti China dan India. Selain itu, penyakit kronik adalah punca utama yang menyebabkan kematian di Malaysia. Malaysia terpaksa mengeksport ubat-ubatan generik daripada pasaran asing dan kerajaan membelanjakan wang yang besar untuk ubat-ubatan dan eksport peralatan perubatan biarpun ubat-ubatan generik. Di samping itu, sektor kesihatan di Malaysia menarik kebanyakan pelancong perubatan dengan adanya terapi tradisional dan perbelanjaan perubatan yang berpatutan. Malaysia telah dipilih sebagai salah satu pusat perubatan di antara negara-negara ASEAN, bagaimanapun industri menghadapi persaingan sengit dari segi harga dan kualiti bersama dengan negara-negara jirannya. Baru-baru ini beberapa penyelidik telah menggariskan faktor-faktor yang menentukan inovasi dalam sektor kesihatan. Pada masa yang sama, bukti kajian sangat terhad dalam mencadangkan satu faktor inovasi ke arah meningkatkan prestasi organisasi penjagaan kesihatan dalam konteks Malaysia. Oleh yang demikian, penyelidikan yang berlebihan diperlukan untuk mengetahui latar belakang amalan inovasi bagi meningkatkan prestasi organisasi dalam sektor penjagaan kesihatan. Kekurangan kajian terhadap faktor-faktor inovasi dalam sektor penjagaan kesihatan dalam konteks Malaysia dapat membuka laluan kepada penyelidik untuk mengkaji faktor-faktor inovasi yang boleh meningkatkan prestasi organisasi dari segi keuntungan, jualan, saham pasaran, dan nilai eksport, bilangan paten dan juga penglibatan firma secara menyeluruh. Berikutan itu, industri kesihatan berkeupayaan untuk meningkatkan prestasi inovasi ke peringkat seterusnya dan pada masa yang sama meluaskan sumbangan Keluaran Dalam Negara Kasar (KDNK) dan usaha eksport. Dalam kajian ini, sokongan bahagian pengurusan atasan, orientasi pasaran dan perikatan penyelidikan dan pembangunan (R & D) telah dikenalpasti sebagai faktor inovasi yang dikaji ke atas prestasi organisasi industri kesihatan. Kajian ini dilaksanakan untuk menilai faktor-faktor yang mempengaruhi inovasi dan menganalisis aktiviti inovasi dalam industri kesihatan ke arah perkembangan prestasi organisasi. Kajian ini mewujudkan satu model analisis yang dikaji secara teliti dengan menggunakan 330 buah syarikat sebagai saiz sampel, sebaliknya data kajian ini diperolehi daripada 95 organisasi yang dianalisis melalui kaedah SPSS. Hasil kajian ini membuktikan bahawa bahagian pengurusan atasan adalah faktor yang utama dan signifikan dalam mempengaruhi prestasi organisasi dalam konteks industri kesihatan di

Malaysia. Tambahan pula, hasil kajian ini menyumbang maklumat baru ke atas keupayaan inovasi kesihatan serta mengimplikasi terhadap teori dan pengurusan.

ACKNOWLEDGEMENTS

First and foremost, I would like to take this opportunity to express my sincere acknowledgement to my supervisor Professor Madya Dr. Juhaini binti Jabar from the Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka (UTeM) for her essential supervision, support and encouragement towards the completion of this thesis.

I would also like to express my greatest gratitude to my co-supervisor Professor Madya Dr Norfaridatul Akmaliah Othman who gave me suggestions and helpful in the process to complete my thesis. Special thanks to UTeM PJP grant funding for the financial support throughout this project.

Particularly, I would also like to express my deepest gratitude to Ms Kanagavalli who has always been as great friend throughout my journey and to all my postgraduate friends for sharing knowledge in statistical technique and has been great supported in the way to finish the analysis work

Special thanks to all my peers, my late father, beloved mother, my fiance Mr.Vijayakumar and siblings for their moral support in completing this thesis. Lastly, thank you to everyone who had been to the crucial parts of realization of this work.

CHAPTER 1

INTRODUCTION

1.1 Project Introduction

This chapter will present the theoretical research background and problem statement of the study. It also introduces the research questions and objectives. This is followed by the research scopes, research limitations, key assumptions of the project, importance of the project and the thesis layout.

1.2 Background of the study

The Malaysian government aims of achieving the status of a developed nation by 2020. Therefore, efforts to attract Foreign Direct Investment (FDI), increase productivity, enhance innovation and promote R&D are crucial. For the Ninth Malaysian plan, the contribution of Total Factor Productivity (TFD) to Gross Domestic Product (GDP) growth increased by about 34.7% compared to 29.0 % during the Eighth Malaysia Plan (The Tenth Malaysia Plan 2011-2015). The ninth Malaysia plan intends to transform Malaysia into a high-income, knowledge-intensive and innovation-led economy. More often than not, the government's role is to accelerate and enable emerging specialisations, especially through joint investment with the industry in terms of skills, guidance, Rsearch and Development (R&D) and facilitating infrastructure growth (The eleventh Malaysia Plan 2016-2020). Therefore, under the Evelenth Malaysian plan, the government will pay more attention to its resources and prioritise

specific national key economic areas (NKEAs) as part of the approach towards greater specialisation. A total of 12 main National Key Economic Areas (NKEA) have been listed down under the Economic Transformation Programme-A Roadmap for Malaysia. These NKEAs were selected based on their expected contribution to the Gross National Income (GNI) and growth opportunities in 2020. Among the 12 NKEAs, the healthcare sector one of the industries that is expected to assist Malaysia in achieving a high-income status. The NKEA sectors shown below in figure 1.1 will evolve over time in the economy according to their performance growth.

Figure 1.1: 12 main NKEA sectors in the Economic Transformation Programme, 2009



es biotechnology as a key part of its efforts to industrialise and increase its knowledge-based economy. Clinical research, infrastructure, promotion of generic drug exports and medical tourism are among the government’s strategies to develop the healthcare market through investment. Foreign investment in private healthcare facilities has also increased

as the country has expanded its role in the medical tourism market – with the number of medical tourists doubling from 2007–2012 (The Tenth Malaysia Plan 2011-2015).

Malaysia given a top priority to healthcare sector with almost a dozen new projects worth about \$300 million under the healthcare NKEA were announced by the Malaysian government in 2014. These projects include three new manufacturing plants, several foreign-domestic joint ventures and the expansion of a current production facility (The Tenth Malaysia Plan 2011-2015). Along with well-established infrastructure and good patent protection, Malaysia has also put in place a set of policies aimed to attract foreign healthcare companies to set up in-country facilities. Malaysia's Science and Technology (S&T) Policy has highlighted the importance of the advancement of S&T as a tool for sustaining economic development and improving the quality of life and national security by 2020. The healthcare sector has been identified as an economically robust sector and a huge contributor to the nation's Gross Domestic Product (GDP). According to the Malaysia Healthcare Travel Council (MHTC), the contribution by the healthcare industry to the GDP exceeded RM 1 billion in 2016. Alternatively, medical tourism has captured the attention of other ASEAN countries towards Malaysia. Malaysia's healthcare sector is thriving and essential to the Malaysian economy. Annually, 10% of the national budget is allocated to the development of the healthcare industry. Despite that, most researchers placed their attention on pharmaceutical and biotechnology industries. Therefore, the researcher is very keen to explore the healthcare industry and intends to identify the factors which lead to innovation activities and the enhancement of organisation performance.

1.3 Problem Statement

According to Frost and Sullivan (2016), Malaysia is well positioned to harness

opportunities in the healthcare services industry especially in areas such as primary care, specialty services, diagnostics services, medical tourism and aged care. The healthcare sector consists of three mainstream industries namely, pharmaceuticals, medical devices and biotechnology. The healthcare industry has been a key contributor for policy makers and the nation's GDP. Through the Science, Technology and Innovation (STI) Policy, the government has allocated funds to drive the healthcare industry towards an innovation economy. Medical tourism is one of the subsectors which leads the healthcare industry with its quality service. The government's aim to achieve the status of a developed nation also relies on the development of healthcare industries in the global market. Middle-income countries such as India and China are well known for their innovative capabilities in the medical sector. Both countries have acquired the latest medical technology and strong market capabilities. Besides that, both countries have also received robust foreign direct investment for the medical sector.

In a nutshell, the Malaysian government aims to facilitate generic export opportunities, medical manufacturers, export platforms, localisation and upgrading, as well as collaboration between MNCs and local manufacturers in order to develop the medical industry. It is also understood that innovative practices by the healthcare industry can have a drastic impact on the Gross Net Income (GNI) which may achieve RM 13.9 billion by the year 2020. The demand for healthcare services is always growing worldwide. Far more high-quality healthcare services are needed, especially in emerging markets with dynamic growth. Developing countries also need substantial investments: three out of the eight United Nations Millennium Development Goals aim to enhance healthcare for large sections of the population. These goals can only be achieved by developing healthcare infrastructure on a sustainable basis, preferably in cooperation with private service-providers. To ensure sustainable and comprehensive

medical care, developing countries and emerging markets face great challenges. The government can join hands with the private sector in order to overcome these challenges. (Wieck et al., 2009)

The Malaysian healthcare industry has room for development in terms of innovation capability and market capabilities. For instance, Ramli and Taher (2008) stated that chronic diseases are the major cause of death and disability in Malaysia as they accounted for 71% of all deaths and 69% of the total number of diseases. Furthermore, Lee (2011) revealed that the healthcare industry has been slow in modifying and innovating its business model compared to other industries. According to the National Key Economic Areas (NKEA), the healthcare industry has been declared as an important sector for the economic layer. Moreover, Malaysia is one of the ASEAN countries which functions as a health hub and is prominent in the field of medical tourism (Lunt et al., 2011). Malaysia's advantages in attracting medical tourists include good location, high quality services and cost-effective healthcare. Additionally, with the current international wave of interest for wellness and traditional therapies, Malaysia is able to attract travelers seeking affordable and high-quality treatment. Therefore, this study intends study the Malaysian healthcare sector and focus on the innovation stream as a resource gap which which has the potential to be developed in the healthcare sector. Enhancement in innovation capabilities can propel healthcare industries to another level. Innovation infusion can also improve organisation performance in term of sales, profit and market share. This study also emphasises that innovation does not stand alone without a competitive advantage. Competitive advantage is a vital source which makes the industry stand out in a global market. Healthcare industry development can lead to a positive impact on medical tourism as well.

Studies of innovation in recent years, (Bers et al., 2009; Naidoo, 2010;

Quintana-garcia, 2010; Liu et al., 2011; De Tienne and Mallette, 2012) have provided empirical evidence that innovation increases profits, new products in the market, sustainability in the economy, ecological and social development , export rates of products and the lifetime of firms in the market. In the Malaysian context, studies applying innovation in the supply chain (Lee, Lee, Schniederjans, 2011), six sigma applications in process innovation (Khaidir and Habidin, 2014), supply chain management (Alain, Chong, Chan, 2010) and also mindfulness-based strategies (Ndubisi, 2012) have been conducted. Furthermore, few scholars have underlined factors that determine innovation in the healthcare sector (Barei, Pen, Simoens, 2013 and Fatokun, Ibrahim & Hassali, 2013). However, there is limited empirical evidence proposing innovative factors towards enhancing organisation performance of the healthcare industry in the Malaysian context. Therefore, more research is needed to address the antecedents of innovative practices in order to boost up organisation performance in the healthcare sector. Limited studies on innovation factors in the healthcare sector in Malaysia led the researcher to review the innovation factors which could affect organisation performance in terms of profit, sales, market share, export rate and the number of patents. Thus, this study emphasises on innovation factors which lead to innovation and organisation performance. The metrics of organisation performance include market share, sales and profit and the number of patents.

1.4 Research Objectives

This research intends to uncover the salient factors needed to encourage more efficient new product development processes in healthcare industries that will eventually lead to radical innovation research output. The findings of this study will be a basis for the healthcare industry to re-strategise the innovation process in order to achieve greater outcomes i.e. radical innovation, new products and commercialisation. The objectives of

this research are as follows:

1. To investigate the innovation factors in the healthcare industry.
- 2a. To analyse the relationship between innovation factors towards enhancing innovation in the healthcare sector.
- 2b. To analyse the relationship between innovation factors towards enhancing organisational performance in the healthcare sector.
3. To determine the most significant innovation factor for practising innovation and enhancing performance of the healthcare industry.

1.5 Research Questions

1. What are the innovation factors in the healthcare industry?
- 2a. To what extent do innovation factors lead to the enhancement of innovation in the healthcare sector?
- 2b. To what extent do innovation factors enhance the organisational performance of the healthcare industry?
3. Which factor is most significant for innovative practices and performance enhancement of the healthcare industry?

1.6 Research Scope

The research scope focuses on identifying and analysing innovation factors which influence innovation and lead to organisational performance within Malaysian healthcare industries. In the context of NKEA, Malaysian healthcare industries consist of biotechnology, pharmaceuticals and medical devices. This research gauges the relationship between factors influencing innovation and performance growth in healthcare industries. Organisations which engaged in this study are companies furnished with pharmaceutical products and medical technology, as well as biotechnology firms with bio-nexus status within Malaysia. Overall, there are a few

categories of organisations involved in this research: public listed companies, multinational companies, local big companies, government-linked companies and small and medium enterprises. The sample size derived in this study are from selected states in peninsular of Malaysia.

This section has discussed the scopes that are covered in this study. However, this study is not complete without its importance of the project. The next section will highlight the outcomes of the project.

1.7 Importance of the project

The key motive of this project is to identify the innovation factors vital for research and development of healthcare industries. Applying innovative practices in the healthcare industry will enable medical tourism to thrive and increase its competitiveness in the global market. Moreover, the healthcare industry is one of the key drivers of a nation's economy. The enhancement of organisation performance of healthcare industries tends to increase its contribution towards GDP growth in future.

In terms of social impact, the use of innovation and technology can lead to healthy lifestyles among the community. In addition, the community will be able to enjoy generic medicine at reasonable prices. This research study can help highlight the importance of innovative ventures in the healthcare industry. In addition, Malaysian healthcare manufacturers as well as Research and Development (R&D) institutes can meet domestic health needs and contribute to global research efforts. Healthcare sector enhancement in performance will contribute good impact on export rates of medicines and medical devices to global market. Malaysian healthcare sector have bright and strong export market in middle eastern countries with halal medicines. Moreover, Malaysia would be strong medical hub among the ASEAN Countries.

1.8 Definition of Terms

In this study, several references and specialised terms have been identified as follows;

Innovation is a complex process related to changes in production functions and processes whereby firms seek to acquire and build upon their distinctive technological competence. It is understood as a set of resources a firm possesses and the way in which these are transformed by innovative capabilities.

The healthcare sector has been identified as one of the National Key Economic Area (NKEA) sectors which is gaining increasing attention from policy makers. In this study, the healthcare sector consists of three main industries namely, pharmaceuticals, medical devices (medical technology) and biotechnology.

Organisation performance is an analysis of healthcare industry performance as a result of innovation factors (Top management, Market Orientation and Research & Development(R&D) alliances). Organisation performance measures the performance of firms through sales and profit, market entry and the number of patents.

Resourced-based view categorises resources into four attributes: valuable, rare, unimitable and non-substitutable (VRIN). The resource-based view (RBV) is a managerial framework used to determine the strategic resources with the potential to deliver comparative advantage to a firm. These resources can be exploited by the firm in order to achieve sustainable competitive advantage.

Top management Support in this study, the top management translates the policy (formulated by the board-of-directors) into goals, objectives, strategies and projects into a shared vision of the future. It makes decisions that affect everyone in the organisation, and is held entirely responsible for the success or failure of the enterprise.

Market orientation, this study utilised Narver and Slater (1990)'s market orientation elements namely, customer orientation, competitor orientation and inter-functional coordination.

Customer orientation as the first component requires understanding not only the current needs of the customer, but also the whole value network of the customer.

Competitor orientation as the second MO component provides the firm with an opportunity to benchmark and compare, e.g. with alternative suppliers

Interfunctional coordination relates to the involvement of personnel and other firm resources across the whole company in creating value for the customers and other stakeholders

1.9 Thesis Layout

This thesis consists of six chapters. Each chapter is devoted to several major aspects of the study.

Chapter 1 explains the background of the study, followed by a problem statement, research objectives, research scope, as well as research limitations. The final part of this chapter highlights the importance of the study.

Chapter 2 summarises the research framework derived from the literature. The overview of manufacturing industries, Malaysian healthcare industries, the importance of innovation for the healthcare sector, factors which lead to innovation activities and organisation performance and the impact of organisation performance are presented.

Chapter 3 illustrates the conceptual model, operationalisation variables and questionnaire construct in detail. This chapter presents the hypotheses that were tested in

chapter 5.

Chapter 4 presents the research methodology of this study which includes sampling method, data collection, target respondents and finally a detailed explanation on the analysis methods used in the research.

Chapter 5 discusses the descriptive analysis, Exploratory Factor Analysis, correlation, regression and logistic analysis. It also includes a detailed discussion and justification of the findings.

Chapter 6 explains the research findings and presents the conclusion of this study. Finally, important implications such as implication theory and implication for managers and policy makers are explained, followed by the limitations and future direction of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter gives an overview of the Malaysian economy and healthcare industries in Malaysia. This chapter intends to highlight how innovative practices evolve in developed and developing countries. In addition, this study identifies salient factors which result in positive impact towards organisation performance.

2.2 Overview of Malaysian economy

Since achieving independence in 1957, Malaysia has demonstrated stable improvement in its economy. Malaysia is a strategic location for investors to set up offshore manufacturing of advanced technological products for local and global markets. Malaysia offers investors a dynamic and vibrant business environment with the ideal fundamentals for growth and profits, supported by a market-oriented economy and pro-business government policies. A well-developed infrastructure and productive workforce are Malaysia's key strengths. In addition, a nation which is politically stable with a well-organised legal system provides incentives for investors to attempt good business deals. The presence of foreign manufacturers in Malaysia continuously demonstrates prospective economic growth through business expansion and diversification (The Malaysian Industrial Development Authority 2016).

Compared to other industrialised nations in ASEAN, Malaysia is considered as the most technologically developed country (The World Bank 2015). The innovatively disposed economy of Malaysia is demonstrated through the nation's inclusion of a highly automated manufacturing sector, advanced electronics manufacturing, R&D, logistics, biotechnology, photonics, design, and innovation. The government's goal is likewise to make Malaysia a center point for other value chain exercises such as design and development (D&D), research and development (R&D), procurement, logistics, distribution and marketing, business support services and shared services. Malaysia achieved a Gross Domestic Profit (GDP) growth of about 4.5%- 5.5 % in 2015 (The Malaysian Industrial Development Authority, 2016).

Understanding innovation in the manufacturing sector is important on several counts. First, despite its impressive growth and contribution to both GDP and employment, a lower productivity suggests deficiencies in both capital and human resource efficiencies. The extent in which innovation drives productivity should be a cause for concern. Second, any reliance on innovation to lift the economy from the “middle-income” status must include innovation in large and dominating manufacturing sectors (Narayanan and Hosseini, 2014).

2.2.1 An overview of manufacturing industries

Manufacturing sectors are closely integrated in a modern economy such that the competitiveness of manufacturing is crucially dependent on the productivity and efficiency of services (Narayanan and Hosseini, 2014). The manufacturing sector contributes largely to GDP growth, external trade and job creation. The manufacturing sector remains as a driving factor for the nation’s economic growth. A strong domestic- and export-oriented industry serves to accelerate the manufacturing sector. Malaysia's

economy increased by 4.5% in the final quarter of 2016 as it was reinforced by the manufacturing and service sector (Bank Negara Malaysia 2016). In 2016, the GDP growth increased by about 4.2%. Table 2.1 shows Malaysia's GDP growth between 2015 and 2016.

Table 2.1: Malaysia's GDP Growth

Sector	Share 2016 (%)	2015		2016		
		Q4	Year	Q3	Q4	Year
		Annual change (%)				
Service	54.2	5.0	5.1	6.1	5.5	5.6
Manufacturing	23.0	5.0	4.9	4.2	4.8	4.4
Mining	8.8	-1.3	4.2	3.0	4.9	2.7
Agriculture	8.1	1.5	1.2	-6.1	-2.4	-5.1
Construction	4.5	7.4	8.2	7.9	5.1	7.4
GDP	98.6	4.5	5.0	4.3	4.5	4.2

Source: Bank Negara Malaysia, 2016

To capitalise on this continuous growth, the Economic Transformation Programme (ETP), domestic finance condition and strong inflows of foreign direct investment are expected to boost business opportunities in the manufacturing sector.

The Malaysian manufacturing industry consists of eleven sectors namely, non-metallic mineral industry, aerospace, textiles and textile products, basic metal products, electrical products, engineering support, food and sustainable resources, machinery and

equipment, medical devices, petrochemicals, and pharmaceuticals (Malaysian Investment Development Authority, 2016). According to Hipp and Grupp, (2005); Cunningham, (2007), Narayanan and Hosseini, (2014) innovation is defined and measured largely in the manufacturing sector. Thus, data on expenditures on R&D, the number of staff employed exclusively for R&D, the number of patents obtained, the introduction of new products, services or processes are considered evidence of innovative activities.

2.3 Overview of healthcare industries in Malaysia

The healthcare industry in Malaysia has become a powerful economic growth engine as a result of demographic change as well as greater prosperity and dynamic lifestyles. The healthcare industry in Malaysia has been growing rapidly and steadily since the beginning of the 90s. It has been identified as one of the National Key Economic Areas (NKEA) under the 10th Malaysia Plan (2011-2015). According to Hidayah Jamaludin et al (2013), healthcare in Malaysia has undergone radical transformation. Healthcare is a vital sector which will prove challenging to endure in this comprehensive economic climate (Khaidir et al., 2013). The booming healthcare industry has been supported by the government allocating RM23bn (US\$5.2bn) for healthcare projects in 2016, which is approximately 10% of the annual budget (Economic Transformation Programme, ETP 2014). Moreover, healthcare is recognised as a fast growing industry which is one of the key drivers for economic growth.

Medical tourism under the ETP has been flourishing, evolving and attracting foreign patients. Revenues from medical tourism are expected to achieve close to thirty percent by 2020 (ETP, 2014). Malaysia is well-positioned to attract medical travelers from China, India, Japan, the United Kingdom (UK) and the Middle East (Saudi Arabia