

**THE IMPACT OF SUPPLIER SELECTION
CRITERIA AND SUPPLIER INVOLVEMENT ON
BUSINESS PERFORMANCE: HIGH-TECHNOLOGY
MEDICAL EQUIPMENT IN PRIVATE HOSPITALS
IN MALAYSIA**

LEE JUN LI

**UNIVERSITI SAINS MALAYSIA
2008**

LEE JUN LI

**THE IMPACT OF SUPPLIER SELECTION CRITERIA AND INVOLVEMENT
ON BUSINESS PERFORMANCE**

2008 M.B.A.

**THE IMPACT OF SUPPLIER SELECTION CRITERIA AND
SUPPLIER INVOLVEMENT ON BUSINESS PERFORMANCE:
HIGH-TECHNOLOGY MEDICAL EQUIPMENT IN PRIVATE
HOSPITALS IN MALAYSIA**

LEE JUN LI

**Research report in partial fulfillment of the requirements for the
degree of MBA**

April 2008

ACKNOWLEDGEMENT

My deepest gratitude goes to the following people for their unlimited help and guidance, which enabled me to finish this research project as part of the requirement for the MBA course. I am forever grateful. Firstly, I wish to thank Dr. Azizah Omar, my principal supervisor who graciously shared her experience and knowledge with me and always attend to my questions. Thanks to Associate Professor Dr. Ramayah, my co-supervisor for his helpful comments and suggestions in my project. Not forgetting also the administrative and academic staff of the School of Management for their help during the progress of this research project.

Last but not least, I would like to share my greatest gratitude towards my beloved family members and friends for their support during the progress of this research project. Their unconditional love and encouragement have made me braved through this challenging period. Also thanks to the management of the participating hospitals for making this research possible.

KESAN KRITERIA PEMILIHAN PEMBEKAL AND PENGLIBATAN PEMBEKAL KE ATAS PRESTASI PERNIAGAAN: ALAT PERUBATAN BERTEKNOLOGI TINGGI DALAM HOSPITAL-HOSPITAL SWASTA DI MALAYSIA

ABSTRAK

Tujuan kajian ini adalah untuk menyelidik kesan kriteria pemilihan and penglibatan pembekal ke atas prestasi perniagaan hospital-hospital swasta dalam Malaysia. Tambahan pula, kajian ini juga bertujuan untuk mengenalpasti sama ada prestasi pembekal mempunyai jalinan pertengahan antara pemilihan dan penglibatan pembekal terhadap prestasi perniagaan.

Model ini adalah dihasilkan melalui bacaan-bacaan sastera yang berkaitan dengan pemilihan pembekal. Dasar teori seperti ekonomi pemindahan kos dan pandangan dasar sumber syarikat telah digunakan untuk membentuk rangka bagi kajian ini. Dasar anggapan di sebalik teori ini mencadangkan bahawa hubungan antara para pembeli and para pembekal merendahkan kos pemindahan dan menampung pelaburan yang berhubung dengan aset tertentu (Williamson, 1991, 1995). Barney (1995) mencadangkan bahawa sumber teras dan kemahiran sesebuah syarikat adalah penting bagi organisasi tersebut untuk memperoleh dan memperkukuhkan kekuatan persaingan mereka. Oleh itu, teknologi perubatan yang digunakan oleh pihak hospital adalah dianggap sebagai sumber firma dan dipercayai boleh membawa pelbagai manfaat kepada hospital-hospital.

Berdasarkan pembacaan sastera yang lalu, soalan penyelidikan telah diubahsuaikan dan dihantar kepada hospital-hospital swasta dalam Malaysia. Keputusan menunjukkan bahawa kebanyakan kriteria pemilihan pembekal yang digunakan seperti harga persaingan, kualiti hasil keluaran, khidmat penghantaran dan kebolehan pembekal tidak memberi kesan yang nyata kepada prestasi perniagaan ataupun prestasi pembekal. Hanya kesesuaian pembeli

dan pembekal yang memberi kesan nyata terhadap prestasi pembekal. Namun demikian, lebih perhatian perlu ditumpukan terhadap penglibatan pembekal kerana kriteria ini memberi kesan yang nyata terhadap prestasi perniagaan. Selain itu, prestasi pembekal tidak mempunyai kesan perantaraan dalam hubungan antara kriteria pemilihan pembekal, penglibatan pembekal and prestasi perniagaan hospital.

Hospital-hospital swasta perlu memberi lebih perhatian dalam pemilihan pembekal untuk meningkatkan kekuatan persaingan mereka dan keperluan jangka masa panjang. Kesimpulannya, kajian ini memberi panduan kepada pihak hospital untuk membuat keputusan pemilihan dan juga memaparkan dimensi-dimensi dalam pemilihan dan penglibatan pembekal dalam industri hospital. Oleh itu, adalah diharapkan kajian ini boleh membawa manfaat yang lebih kepada strategi pembelian dan peningkatan prestasi antara pembeli and pembekal.

THE IMPACT OF SUPPLIER SELECTION CRITERIA AND SUPPLIER INVOLVEMENT ON BUSINESS PERFORMANCE: HIGH-TECHNOLOGY MEDICAL EQUIPMENT IN PRIVATE HOSPITALS IN MALAYSIA

ABSTRACT

The purpose of this study is to examine the impact of supplier selection criteria and supplier involvement on the private hospitals' business performance in Malaysia. Furthermore, this study intends to find out whether supplier performance mediates the supplier selection and involvement on the business performance.

The model is developed via extensive supplier selection literature. Theoretical basis such as the transaction cost economics and resource-based view of the firm are used to develop the framework for the present study. The basic assumption underlying the theory suggests that relationships between buyers and suppliers lower transaction costs and facilitate investment in relation-specific asset (Williamson, 1981, 1985). Barney (1995) suggested that a firm's core resources and capabilities are the important tools for the organization in gaining and preserving sustainable competitive advantage. Therefore, the medical technology adopted by the hospitals was considered as the firm resources and believed to bring numerous benefits to the hospitals.

Based on previous literature, the survey instrument is modified and the revised instrument is mailed to the private hospitals in Malaysia. Results indicate that most commonly used criteria such as competitive pricing, product quality, delivery service and supplier capability are found to be insignificant related to hospitals business performance. Only buyer-supplier fit is positively impact on supplier performance. Nevertheless, greater emphasis should be placed on supplier involvement because the intangible criteria have

significantly impact on the hospitals business performance. Consequently, supplier performance does not have the mediating effect on the relationship between supplier selection criteria, supplier involvement and hospital business performance.

Private hospitals should carefully select their suppliers to enhance their competitive advantage and long-term needs. In summary, the present study provides guidelines for the hospital boards to analyze the selection decisions and also shows the dimensions of supplier selection and supplier involvement applicable to the hospital industry. Thus, it is hoped that this study will contribute to better purchasing strategies and greater buyer-supplier performance.

Chapter 1

INTRODUCTION

1.0 Introduction

The demand for quality healthcare continues to rise in Malaysia despite the affluence and rising of consumer awareness towards their health condition. This evidence can be seen that 3% of the country's Gross Domestic Product (GDP) is spent on healthcare and expected to increase with the growing population and a longer life expectancy (Espicom, 2006). Healthcare remains a priority of the Malaysian government over the nations' health wellness. The allocation for healthcare under the Ninth Malaysia plan for 2006-2010 has focused more on upgrading and maintenance of existing facilities and equipment and the quality of healthcare.

As the baby-boom generation continues to age and the changing of new lifestyles, the healthcare system in Malaysia will continue to face the new challenges. It is known that age will incur with a higher medical expenditure as age-related illnesses such as heart diseases and diabetes often occur towards the very end of lives (www.piribo.com/publications). Moreover, the number of communicable diseases such as human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and Tuberculosis continue to grow rapidly over the years as a result of the rapid industrialization and socioeconomic changes (Ministry of Health, 2006).

While the escalation of healthcare cost continues over the years, healthcare providers have been putting lots of effort in reducing the healthcare cost and to deliver healthcare more efficiently and cost-effectively (Polley and Shanklin, 1993; Butler, 1995; Lambert, D.M., Adams, R.J., and Emmelhainz, M.A., 1997; Kumar, A., Ozdamar, L., and Ng, C.P., 2005).

Thus, purchasing has become a focal point of cost reduction for the hospitals to become more cost competitive.

1.1 Background

The cost of delivery healthcare to the public has been increased tremendously in recent years (Pauly, 1995). This has raised the concern among the healthcare providers in reducing these costs. Further to this, cost of technology is among the highest of the healthcare cost and it is expected to rise as the medical technology and innovation provides the improved methods of treatment for the patient's health (Mohagheh, 2007). However, the use of technology might attract the patient to seek treatments from the healthcare provider who have the latest technology diagnostic equipment. In addition, Irwin, J.G., Hoffman, J.J., and Lamont, B.T (1998) suggested that organizations could improve their performance by acquiring new technologies.

Besides, Bodenheimer (2005) stated that the cost of technology would also impact on the quality and healthcare's benefits. Chernew (2004) also supported that there is a connection between quality, technology and market competition. Being the perceived quality as a quality leader, the hospitals need to become indispensable, and advance technology is needed to achieve this position (Irwin, J.G., Hoffman, J.J., and Lamont, B.T., 1998).

The improved medical technology and techniques has resulted the prolonging of life. However, the demand for the better medical technology has lead the healthcare cost to rise (Mohagheh, 2007). This has lead the healthcare providers strive to reduce the healthcare cost without compromising the quality and service as the patient has been demanding high quality with low cost charges (Kumar et al., 2005). Nevertheless, the reductions of healthcare costs are doubt to be achieved at the expense of quality because of the stiff competition

among the healthcare providers to achieve profitability at the same time (Minahan, 2007). As a result, the hospitals need to enact a cost efficient management to assist them in attaining their mission.

1.2 The Importance of Supplier Selection and Supplier Involvement

Supplier selection is widely recognized as the most important responsibility of the purchasing function because the organization's suppliers can affect the price, quality, delivery reliability and availability of its products (Pearson and Ellram, 1995). Companies aim that proper supplier selection would help to reduce product and material costs while maintaining a high level of quality and after-sales services (Sonmez, 2006). Therefore, an efficient supplier selection process needs to be in place for the successful supply chain management.

Many hospitals have realized that they can sustain the cost reductions and improve their quality of care by concentrating on their purchasing and supplier management (Kumar et al., 2007). Minahan (2007) added that a 5% improvement in supply saving can help the hospitals to boost up their operating profits by 1-3%. These profits can be reinvested in hiring the best physicians, doctors and nursing staff to drive up the quality of healthcare.

Besides, supplier selection is a crucial purchasing activity for many firms as it could improve on the firm's resources and core competencies (Hsu, Kannan, Leong and Tan, 2006). The importance of purchasing and materials management has been agreed by the top management of Honda of America and Daimler-Chrysler in order to focus on their core competencies. Hence, these organizations rely heavily on their suppliers to sustain competitive advantage and improved performance (Fitzgerald, 1995; Krause, 1997).

While there was an extensive importance of supplier selection presented, supplier involvement can also lead to better supplier performance, improved manufacturing, products

and process advancements that enhance the customer satisfaction and firm performance (Tracey and Vonderembse, 2000). Relative benefits can be gained through the involvement of suppliers on product development and continuous improvement teams. As such, both supplier selection and involvement have insert a positive impact on the supplier performance and buying firm's performance (Kannan and Tan, 2002). In summary, to sustain effective and reliable sources of suppliers, buyer should select their suppliers carefully and evaluate them regularly.

1.3 Motivation for Capital Equipment Purchases

Fueled by rapid advances in technology, some private hospitals rush out to buy the latest equipment simply to compete with other hospitals in the race to offer the latest procedures of treatment (Minahan, 2007). In many cases, the medical equipment was bought without sufficient analysis that the new equipment would able to generate enough revenue to cover the debt service and operational expenses. Such imprudent decisions are due to a lack of clear perceptive policies directing the purchase of high-tech diagnostic and therapeutic equipment.

In the past, hospitals purchased diagnostic and therapeutic devices based on the recommendation of the specialists, making them the major role of the decision makers (Polley and Shanklin, 1993). Prior to preserving the relationships with these specialists as their primary source of patient referrals, the hospitals have been contently purchase the equipment without making any in-depth economic evaluation.

Today, hospitals especially the private sector are adapting to the market restraints in healthcare spending in order to remain competitive (Lambert et al., 1997). The hospital boards also realized the need of cutting expenses, segmenting their target markets to build the market share and developing new services to the patient (Kumar et al., 2006). Diagnostic and

therapeutic equipment is viewed as a long-term investment that should return more than a dollar in revenue for each dollar spent (Malcolmson, 1989). As a result, the hospitals need to develop a prospective capital equipment purchasing policies to prevent the wasteful expenditures and to support long-term hospital goals (Unikrishnan and Rao, 2002).

More attention have been placed to the capital equipment expenditures and key issues such as demographics, return on investment, service records, ease of use, ability to be upgraded and staff training to be fully addressed before the purchase was made (Malcolmson, 1988).

1.4 Hospital Purchasing Processes

According to Webster and Wind model cited by Egilson and Fanger (2000) in the organizational buying model, there are several steps in the equipment purchasing process.

- 1) Hospital's needs are identified;
- 2) Objectives and specifications established;
- 3) Identification of various buying option offered in the markets;
- 4) Evaluation and comparison of product specifications;
- 5) Establishment of tenders;
- 6) Pre-trials and product presentation;
- 7) Filtration (of the short list of suppliers);
- 8) Selecting the final supplier;
- 9) After-sales follow-up.

It is known to be normal that multiple buying influencers exist in the hospital purchasing decision. Users of the product (physicians) often propose the needs of the buying

equipment in a meeting (Polley and Shanklin, 1993). Then, purchasing organization will gather information and setting up outlines to made available to the buying center. Others members of the buying center may arise from the managerial levels such buyers-purchasing agents, office managers, vice presidents who would formally select the suppliers to be used and arrange the terms of purchase. Therefore, LaForge and Stone (1989) added that personal interaction among the members of the buying center is crucial when it involves a major and non-routine purchase especially for the acquisition of high-technology medical equipment.

1.4.1 Public and Private Hospitals Medical Equipment Purchases

The purchasing process for high-technology medical equipment in public hospitals is quite different from the buying process in private hospitals.

1.4.1.1 Public Hospitals Purchases

Generally, health equipment purchases are classified into two categories in the public sector:

Category 1: Above RM50, 000 (US\$11,800).

Category 2: Under RM50, 000

The Ministry of Health (MOH) needs to advertise the tender in the local newspapers for purchases of medical equipment greater than RM50, 000. The tender are then open to the distributors based on the stipulated date and required them to submit the specifications and prices for their products. Once tenders are closed, the member of the board of meeting that consists of one member of the MOH and at least two other members that are usually heads of department of the purchasing institutions will be formed to evaluate the bids. On the other hand, for purchases less than RM50, 000, hospitals and public institutions will call for and consider tenders on their own (Gross, 1999).

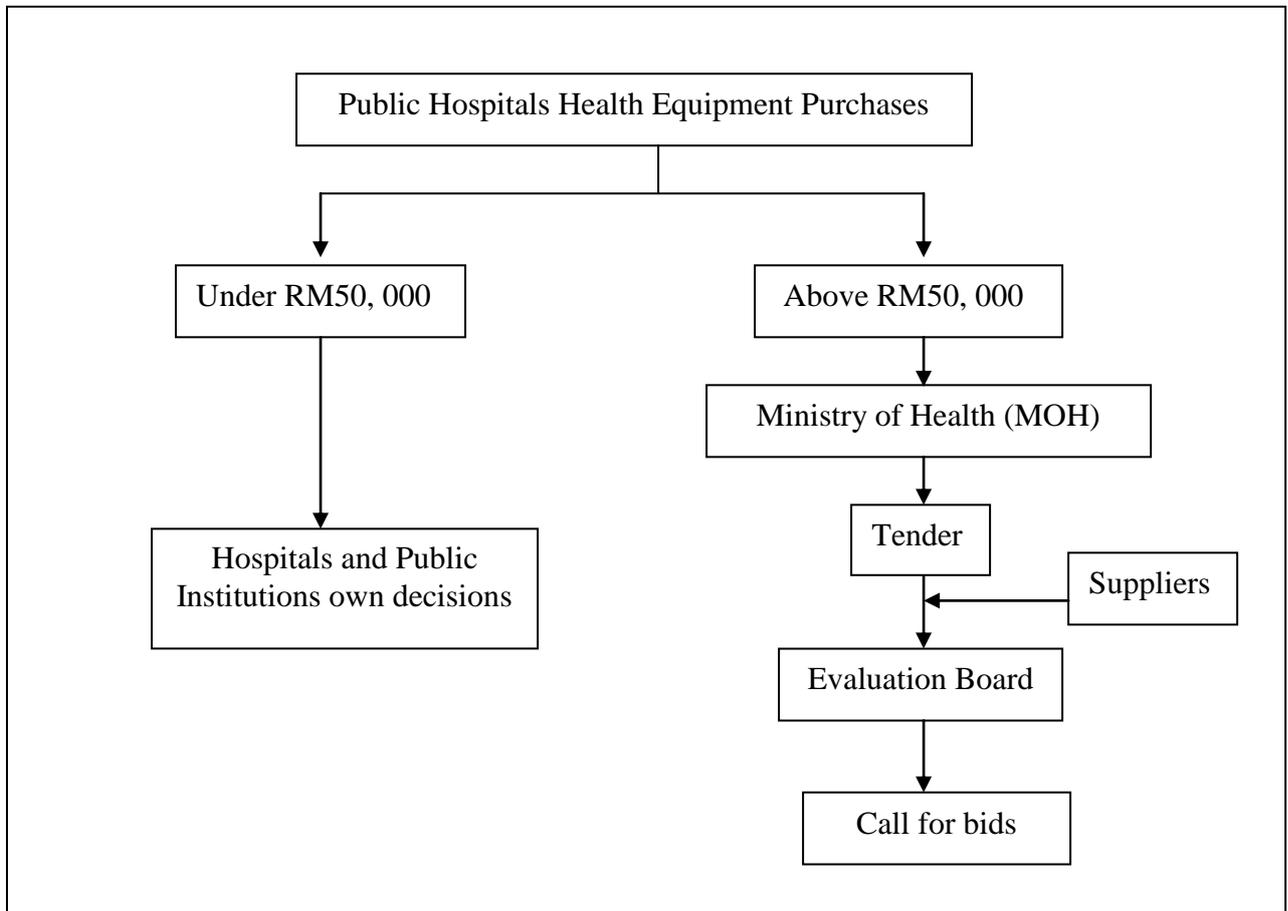


Figure 1.1. Public hospitals health equipment purchase processes.

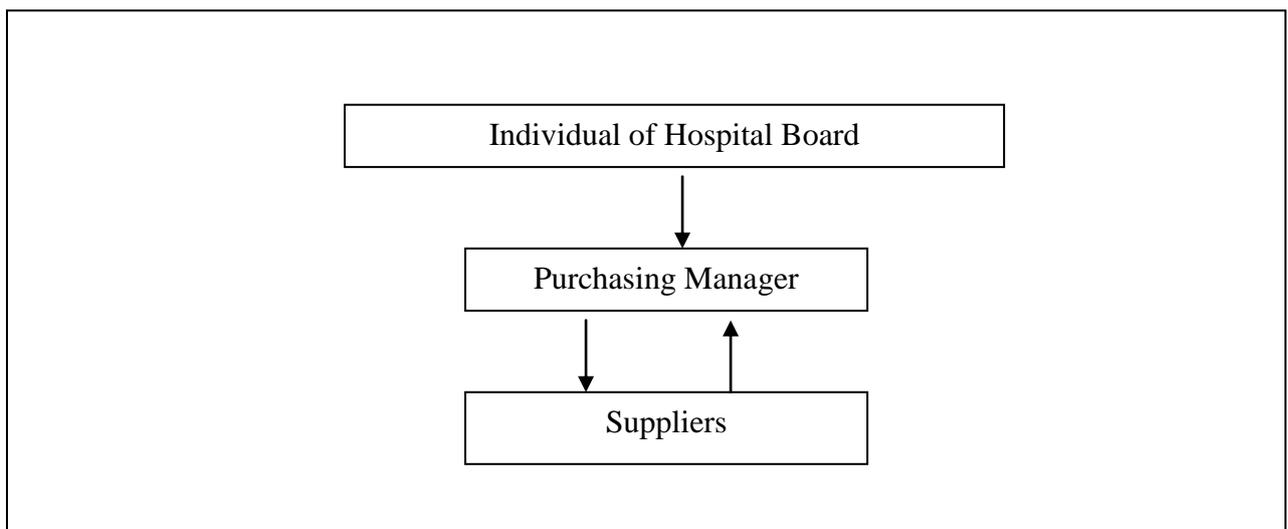


Figure 1.2. Private hospitals health equipment purchase processes.

1.4.1.2 Private Hospitals Purchases

In the private sector, the purchases processes will be simpler where the healthcare chains are the purchasing manager and the management of the hospitals consists of the chief executive officer, consultants and technician staffs. The distributors are also requested to provide the necessary specification of equipment through the hospital procurement procedure. For hospital with sub-branches, there are sometimes allowed to purchase equipment by making their own decision provided there is at least a member of the central office on the individual hospital board (Gross, 1999).

Nevertheless, while the public and private hospitals having the different methods in purchasing medical equipment, the settings of criteria are almost the same for their purchases. Among the important factors are the price, quality, equipment's specifications and after-sales service of the distributor especially for purchases of electro-medical and other high-tech equipment (Gross, 1999).

1.5 Medical Equipment Industry

It has been stated that the Malaysian market for medical equipment, devices and supplies is US\$347 million in 2005 (Espicom, 2006). Prior to this, the imports of high-technology medical equipment in Malaysia were RM929 million which was almost the same as the exports of RM904.63 million in 2002.

Besides, Malaysia offers a great opportunity for Asia healthcare market as it has occupied about 34% of the global healthcare market. There are a wide and different range of imported medical equipment and products to accommodate the growing healthcare needs. With the full realization of the ASEAN Free Trade Area (AFTA) in 2003, medical devices

manufacturers benefit from a single market with a total population of 550 million people, a combined GDP of US\$800 billion and total trade of US\$720 billion (Espicom, 2006).

The Third Industrial Master Plan (IMP3), 2006 – 2020 has also highlighted on the development of the medical device industry to enable it to advance and sustain its global competitiveness. Under this plan, foreign medical device companies are encouraged to undertake outsourcing of components, sub-assemblies and establish manufacturing facilities with design and development activities for medical devices in Malaysia (Espicom, 2006).

The Malaysian government is also actively promoting the medical device industry as a strategic industry and encourages the manufacture of more expensive and advanced equipment in the country (Espicom, 2006). As a result, many companies have developed strategies marketing to accommodate the fast changing business environment.

The major players in high-technology medical equipment industry are multinational companies having a diversified portfolio. The main companies involved in manufacturing and selling of high-technology medical equipment are Philips, General Electric, Hitachi, Toshiba and Siemens (Unikrisnan and Rao, 2002).

1.6 Types of High-technology Medical Equipment

High - technology medical equipment often make reference to the most advance and expensive diagnostic and treatment tool (Polley and Shanklin, 1993). A series of diagnostic and therapeutic procedure are usually carried out with the utilization of the sophisticated equipment to assist in the process of treatments (Unikrisnan and Rao, 2002). Typically, high-tech equipment is technically complex, costly to acquire and must meet strict requirements in terms of standards, performance and safety regulations (Gross, 1999). The cost of acquiring

medical equipment ranges from a minimum of RM50, 000 up to RM5 millions and above plus the outlays for installation.

The scope of this study is limited to high-technology medical equipment such as Magnetic Resonance Imaging Systems (MRI Systems), Computed Tomography Scanner (CT Scanner), Ultrasounds, X-ray equipment and Positron Emission Tomography Scanner (PET Scanner).

MRI systems, with their large round-shaped magnet that uses radio wave and high magnetic field to provide physicians with high quality images of the inside human body. It shows the best quality images for soft tissues diseases like cancer, multiple sclerosis, tumors and other abnormalities of the brain and spinal cord. It is a non-invasive procedure to detect disease and abnormality. MRI allows radiologist to make image evaluation of all body regions, the physicians can look at any slice at any angle and monitor the processes occurring within such as plaque building up in arteries around the heart and observe the malignant tumor to different types of therapy (Toshiba Medical Systems, 2008).

On the other hand, the CT scanner uses a fan beam of X-rays and detector system to create a thin cross – sectional images of the head, neck, chest, abdomen and extremities that enhance view ability for early detection of many conditions. It provides faster examination times and diagnosis in a wide field (Toshiba Medical Systems, 2008).



Figure 1.3. Types of medical equipment.

Besides, ultrasounds use high frequency sound waves and echoes to display images of the patient's internal organ picture on the screen of the portable machines. The main advantage is that it is a non-invasive diagnostic procedure and instantly produces images without using radiation. Ultrasounds are widely used in obstetrics and gynecology, cardiology and urology (Toshiba Medical Systems, 2008).

X-ray equipment covers line of equipment including angiography, fluoroscopy, general radiography, mammography and surgical C-arms. The principles used in these equipments are basically the same that the X-rays are radiated through the body part of interest and onto a film cassette positioned under the body part. Mammogram is a special radiological examination for the breasts by using low energy x-ray to detect early cancers such as breast tumors whereas angiography displays imaging of a system of blood vessels after the injection of a dye opaque to X-rays. Fluoroscopy is an X-ray procedure that makes it possible to see internal organs in motion whereas C-arm is a mobile fluoroscopy system used for studies ranging from orthopedics to cardiology (Toshiba Medical Systems, 2008).



Figure 1.4. Types of medical equipment.

PET scanner has the capabilities in detection of coronary artery disease and determines whether a heart tissue is functioning properly. PET scanner is used in body

scanning that detects radioactive compounds and monitor chemical and radiation therapy quickly and non-invasively (RadiologyInfo, 2008).

1.7 Demands for High-technology Medical Equipment

In a highly competitive healthcare market, advanced medical equipment is seen as a strategic tool to attract both physicians and patients to a hospital because high-tech equipment can provide higher quality images (Kung, Tsai, Yaung and Liao, 2005). Many hospitals have used the strategy to promote their high-technology equipment to attract the prominent consultants and thus attract patient referrals to the hospital because 'high-tech' hospitals are often relates to higher perceived hospital quality (Noether, 1988; Smith and Reid, 1986). As a result, hospitals are constantly upgrading themselves to fulfill the patient needs, profitability and revenue generation.

Generally, hospitals focus on its target markets to offer specialized diagnostic and treatment capabilities to attract their customers. The suppliers also helped in the marketing support programs such as providing materials consist of prototype news releases on the latest equipment installed in the hospital, educational brochures and other literature to the patients and referring doctors (Wagner, 1989). Hence, public promotion can influence the patients in the selection of healthcare providers thus making a marketing difference in the healthcare services.

This niche strategy requires substantial financial investment in high-technology equipment that contributes to the major cost in medical care (Polley and Shanklin, 1993). The advanced medical technologies are constantly referred to higher purchase price but it can make the long-term cost more effective rather that using a similar medical device with cheaper basic technology. With the advanced medical equipment, the hospitals shall be able

to increase the treating of more patients per day, reduce recovery times and early diagnosis of medical problems to achieve higher quality of life (Irwin et al., 1998). As a result, hospitals are beginning to promote their high-technology equipment to ensure that they receive a favorable return on the expensive investments.

In addition, baby boomers are living longer lives than the previous generations, requiring more sophisticated and longer-term healthcare. Thus, the demand for advanced medical electronic equipment is high. Moreover, new technologies are expected to enhance the quality and length of patients' lives when they get older (Mendelson and Schwartz, 1993).

The growth of health tourism has become the important source of income to private healthcare providers because Malaysia has increasingly become one of the medical tourist attractions (Association of Private Hospitals of Malaysia, 2008). As a result, private hospitals are competing to provide the best treatments and hospitality to their customers.

1.8 Problem Statement

Due to the healthcare paradigm shifts, hospitals need the most advanced technologies to remain competitive but they are often unable to justify the cost of a new purchase or equipment upgrade. Besides, there are other challenges that the hospitals need to consider such as expenses to start-up, hiring and training of personnel and marketing that may add in additional costs to the hospitals.

Butler (1995) pointed out that the hospitals have been alert of the increasing cost of delivery healthcare and feel the needs to overcome the expectations of higher quality in patient care. This has been highlighted by Alt (1997) that the complicated purchasing procedures and inadequacy of medical supply purchasing has drives the healthcare costs to

increase. As such, better sourcing of supplier selection criteria are crucial for the hospitals to utilize their resources more effectively.

While the cost versus quality issue is more often focused on delivery of healthcare to patient, this has also indirectly affects on the purchasing of healthcare products and supplies by hospitals. Suppliers selling to hospitals continue to feel the effects, as hospitals pressure their suppliers for concessions (Polley and Shanklin, 1993).

A decision was made to examine the hospital industry particularly the private hospitals because hospitals were once seen as noncompetitive organization but current environment changes in recent years has resulted in an increasingly competitive hospital market in Malaysia. The hospitals paradigm of delivery healthcare practices has now taken much the same characteristics as normal business organizations (Taggart and Griffin, 1989). Added to this, Mohanty, R.P., Santi, K., and Haripriya, C. (1996) argued that same forms of analysis, evaluation and improvement can be applied to the healthcare systems as the hospital share many similarities to other industrial systems despite some unique factors.

Therefore, there is a need for the private hospitals to realize the importance of finding an effective healthcare supply chain to improve their business performance in terms of revenues growth, return on assets, market share, and overall competition. The evaluation of the supplier selection and supplier involvement are necessary for the private hospitals in making the appropriate decisions through the application of supply chain best practices from other industries.

1.9 Research Objectives

1. To examine the impact of supplier selection criteria on private hospital's business performance.
2. To examine the impact of supplier involvement on private hospital's business performance.
3. To examine the impact of supplier selection criteria on supplier performance.
4. To examine the impact of supplier involvement on supplier performance.
5. To examine the impact of supplier performance on private hospital's business performance.
6. To examine whether the relationship between supplier selection criteria, supplier involvement and private hospital's business performance are mediated by supplier performance.

1.10 Research Questions

1. Does supplier selection criteria has an impact on private hospital's business performance?
2. Does supplier involvement has an impact on private hospital's business performance?
3. Does supplier selection criteria has an impact on supplier performance?
4. Does supplier involvement has an impact on supplier performance?
5. Are the chosen supplier who perform well has higher impact on the private hospital's business performance?
6. Does the relationship between supplier selection criteria, supplier involvement and private hospital's business performance mediated by supplier performance?

1.11 Definition of Key Term

1.11.1 Supplier Selection Criteria

Supplier selection criteria refer to a set of standard that a selection panel considers when assessing and evaluating suppliers. Selection criteria reflect the competencies to ensure that the suppliers have the capabilities to fulfill the organization needs.

1.11.2 Medical Equipment

As cited in Directive 90/336/EEC, the European definition of a medical equipment refers to “any instrument, apparatus, appliance, material or other article, whether used alone or in combination together with any accessories or software necessary for its proper application, intended by the person under whose name it is to be supplied, to be used for human-beings for the purposes of one or more of the following:

- Diagnosis, prevention, monitoring, treatment or alleviation of disease and injury;
- Investigation, replacement or modification of the anatomy or of a physiological process;
- Control of conception.

and does not achieve its principal intended action in or on the human body by pharmacological,

immunological or metabolic means, but which may be assisted in its function by such means” (Medical Device, 2001).

1.11.3 Private Hospitals

Private hospitals are categorized into for-profit and not-for-profit private hospitals. Unlike public hospitals that are government-funded hospitals, these hospitals need to generate

revenue to support its on-going operations and capital needs. Public hospitals are expected to provide the best possible health services to the society and their main goals are not to get a high profit.

On the other hand, private hospitals are normally control by private individuals or associates fully owned by Malaysian, local and foreign joint venture companies, or fully owned by foreign company. For-profit private hospitals are profit-oriented proprietary hospitals and expected to generate profits for their shareholders whereas not-for-profit hospitals could be part of the religious organization that could be refer as the community or charity hospitals.

1.12 Significance of the Study

The overall concern of the study is to produce knowledge about the supplier selection used for selecting high-technology medical equipment suppliers in Malaysia. The determinants of supplier selection are used to investigate whether these determinants have an impact on private hospitals' business performance. Thus, this study helps to reflect the expectation of the healthcare providers in Malaysia on the medical equipment suppliers and provide significance effects on the managerial implication of the hospital boards.

The findings of the study also communicate the purchasing professionals perceptions of the suppliers' performance in the healthcare industry. As such, they can better develop their skills in assessing the supply markets and supplier selection. For the suppliers, it helps them to understand the expectations of their customers by identifying the hospitals' perceptions regarding the strengths and weaknesses of the suppliers. Thus, this study would help them to refocus their resources that may be lag behind. The dimensions measured in the

studies could also be improved as the competitive advantage of the medical equipment suppliers.

1.13 Organization of Remaining Chapters

There are five chapters consisted in this report. Chapter 1 provides the introduction and an overview of the research that provide the background of the study. This chapter consists of the problem statement, the research objectives and research questions to be answered. The significance of the study is addressed to show the rationale of conducting the study.

Chapter 2 introduces the literature reviews on the dependent variable and independent variables. Related variables definitions are layoff in this chapter. It also provides the basic of the present study and helps to develop the theoretical framework and hypothesis. Following this, the methodology and data analysis are discussed in Chapter 3. This chapter encompasses the sample and unit analysis, data collection method, measurements and the statistical analysis.

Chapter 4 presents the profile of respondents, goodness of measures, descriptive analysis and the results of statistical data analysis. This paper concludes in Chapter 5 with the discussion of the results and the implications of these results for the healthcare industry as well as for researchers. Implications and contributions will be covered while limitations will be reviewed with recommendations for future research.

Chapter 2

LITERATURE REVIEW

2.0 Introduction

The role of technological innovation within the business setting is considered crucial for the firms to generate various positive outcomes and sustain competitive advantage (Salavou, 2004). According to Irwin et al. (1998), acquisition of new technologies helps to improve the performance of a buying firm. While numerous studies have focused on the identification of the determinants of the acquisition of technological instrumentation, fewer studies have examined on the relationship between the strategic purchasing of the advance equipment and performance (Li and Collier, 2000; Irwin et al., 1998; Damanpour, 1991).

Due to the rising cost of technology explained in the earlier chapter, one way private hospitals have attempted to reduce cost is through the implementation of an effective sourcing procedure and purchasing decision (Kumar et al., 2005). Suppliers play a vital part in helping firms to sustain their competitive advantage. Thus, buying firms are encouraged to be more carefully consider the supplier evaluation and supplier development (Humphreys, P.K., Li, W.L., and Chan, L.Y., 2004). It is interested to determine the effect of supplier selection criteria and supplier involvement on the private hospital's business performance while they acquiring high-technology medical equipment to stay competitive in the healthcare industry,

2.1 Conceptual Framework

Transaction cost economics and the resource-based view of the firm formed the theoretical basis for the construct of supplier selection.

2.1.1 Transaction Cost Economics

The theory of transaction cost economics was driven by the objective of profit maximization. The basic assumption underlying the theory suggests that relationships between buyers and suppliers lower transaction costs and facilitate investment in relation-specific asset (Williamson, 1981, 1985). This makes reference to the relative cost of using markets as opposed to firm controlled resources for determining the resource allocation decisions. In the context of sourcing decisions, the firms source internally to minimize costs. This will prevent the supplier from taking for granted on the buyer side. On the other hand, if the supplier can produce a lower cost compared to sourcing internally, then the buyer should choose for external sourcing (Hsu et al., 2006). However, transaction costs does not depend duly on the quantity or variety of the products but also the supplier ability in fulfilling the buyer expectations (Hsu et al., 2006). It is found that opportunism will not be a concern over highly specific assets if there is mutual beneficial relationship between the buyer and suppliers (Irwin et al, 1998).

2.1.2 Resource-based View of the Firm

The sources of competitive advantage and superior firm performance were a major area of research in strategic management. Barney (1995) suggested that a firm's core resources and capabilities are the important tools for the organization in gaining and preserving sustainable competitive advantage. Thus, the needs of selecting supplier were not only to meet the buyer needs in term of products and performance but also in alignment with goals and objectives of both parties (Hsu et al., 2006). According to Barney (1991) definition, resources refer to all assets, capabilities, organizational processes, firm attributes, information and knowledge controlled by a firm that can improve its efficiency and effectiveness. Therefore, the medical

technology adopted by the hospitals was considered as the firm resources in the context of this study and was believed to bring numerous benefits to the hospitals.

2.2 Review of Literature

2.2.1 Supplier Selection Criteria

The supplier selection studies have been the focus of many academics and purchasing authorities since the last decade. Research on supplier selection can be traced back to the early 1960s. Dickson (1966) as cited by Kannan and Tan (2002) conducted a survey on the purchasers in order to identify the factors considered important when awarding business to competing suppliers. He found that there were three common criteria to be considered regardless of the different situation in the selection. They were quality, on-time delivery and supplier performance history. Results of this study were confirmed by (Perrealt and Russ, 1976; as cited by Frost and Long, 2000) when they found that the delivery service criterion was rated second to product quality when it comes to influencing industrial purchasing decisions.

Later, Dempsey (1978) as cited by Kannan and Tan (2002) found that the three most important criteria for capital equipment suppliers were delivery capability, technical capability and quality. In the industrial buying process, the two most important decisions to be concerned are the selection of suppliers and the periodic evaluation of their performance (Mummalaneni, Dubas and Chao, 1996). Lambert et al. (1997) also agreed that cost, quality and service are the three main categories when deciding on supplier selection parameters. Hence, the findings revealed that the supplier selection process is usually made on the basis of cost, quality, delivery and service for major decisions making process (Ghodsypour and O'Brien, 1998).

Nevertheless, findings of previous researches also indicate that the importance of supplier selection criteria does vary based on the type of purchase and product and there is no common list of criteria used across the supplier selection studies (Pearson and Ellram, 1995). The underlying characteristics of supplier selection are abstract and difficult to measure, thus it is important to establish a set of criteria to evaluate and compare potential sources each time a purchase situation arises (Kannan and Tan, 2002).

2.2.1.1 Competitive Pricing

Competitive pricing is found to be one of the four dimensions of customer satisfaction that can improve the overall business performance of a manufacturing firm (Tracey and Tan, 2001; Tracey, 1998; Quinn, 1997). Further, price plays an important criterion in supplier selection when purchasing high-technology equipment because it takes longer time to reach the break-even points (Unikrishnan and Rao, 2002). Therefore, the company must find a high quality but value for cost equipment to achieve profit maximization (Minahan, 2007).

The perception of customers regarding on pricing of high-technology medical equipment are mostly overpriced (Unikrishnan and Rao, 2002). Fewer of them think that the high-tech medical equipment is reasonably priced or value for money. As a result, some hospitals even have to delay the buying process because of the financial constraints on the allocation fund for the healthcare expenditures.

The market for high-technology medical equipment is price sensitive (Unikrishnan and Rao, 2002). In many cases, hospitals often settle with the better deal equipment offered after they have negotiated the prices and terms with various suppliers. Hence, competitions between the medical equipment suppliers are very aggressive in order to penetrate into the sizeable market.

However, price alone may not give a sustainable competitive advantage for the suppliers as quality is viewed as the primary factor in purchasing medical equipment. Pricing strategy comes next after the product strategy has met the essential needs of the customers. Other important dimensions considered in the equipment purchasing include product performance, delivery and flexibility that are aligned with the package offered (Gunasekaran, A., Patel, C., and Tirtiroglu, E., 2001).

2.2.1.2 Product Quality

Tracey and Tan (2001) and Tracey (1998) found that product quality enhances the capabilities of the firm and results in improved firm performance through customer satisfaction. Product quality is the prime factor in purchasing equipment (Unikrishnan and Rao, 2002). In addition, Perry and Perkins (1992) applied the dimensions to capital equipment purchasing and found that performance, reliability, durability and serviceability to be the important factors in industrial purchasing. While relevant dimensions depend on the product and the buyer, buyers of similar products tend to seek similar product quality dimensions (Larson, 1994).

The vendors are normally requested to submit a summary of specifications that suits the needs of the hospitals (Dzever et al., 2001). The hospitals will then revise all the options offered and short listed the various criteria base on the equipment's functionality, ease-of-use, ergonomics and integration with workflow; flexibility, reliability, support and training.

Serviceability of the product exerts a great impact on the healthcare cost after the initial purchase of equipment is made (Chase, Jacobs, Aquilano and Agarwal, 2006). Most customers felt that the cost of spare parts supplied by the suppliers is unreasonably high. Customer expressed that some companies purposely reduce the product life by refusing to

supply spares in the name of obsolete units (Unikrishnan and Rao, 2002). Thus, servicing and spare parts are becoming increasingly important as part of the sales in the healthcare industry. It also affects the warranty and repair cost for long-term commitment of the devices (Chase et al., 2006).

2.2.1.3 Delivery Service

The strength of supplier's commitment for on-time delivery service includes follow-up services is considered in the supplier selection (Min, 1994). The supplier's ability to deliver more quickly than its competitors can be an added advantage (Chase et al., 2006) and satisfy their customers in respect to the overall business performance (Tracey and Tan, 2001).

Prior to this, suppliers need a strong sales team to better manage their pre-sales services such as response to the sales inquiries, explanation of product special features, spare parts availability and assist in the arrangement for financial advices (Unikrishnan and Rao, 2002). Generally, the end-user (physician) or purchasing managers will request for the equipment specifications and product demonstration from the salesperson before they decide on which machines to purchase (Dzever et al., 2001). Cebi and Bayrakta (2003) also stated that the delivery lead-time, flexibility in changing the order, and delivery in good condition is an important criterion for decision support on supplier selection.

Besides, delivery service also refers to the response of the suppliers towards their post-sales services such as equipment installation (Unikrishnan and Rao, 2002). These follow-ups are important to the purchasing organization in terms of procurement planning. For instance, private hospitals need to follow guidelines stipulated by the regulatory boards of government for the approvals of high-technology equipment installation in their hospitals (Unikrishnan and Rao, 2002). The approvals normally involve the compliance of Ministry of