INTERNATIONAL ACADEMIC RESEARCH JOURNAL of BUSINESS AND TECHNOLOGY
WWW.IARJOURNAL.COM
IARJ - BT

IARJ INTERNATIONAL ACADEMIC RESEARCH JOURNAL

ISSN :2289-8433

International Academic Research Journal of Business and Technology

Journal homepage : www.iarjournal.com

The Influence of Inventory Management Practices Towards Inventory Management Performance in Malaysian Public Hospitals

Fariza Ahmad Mahyadin@Mahidin[1], Rohaizah Saad[2], Mohd Norhasni Mohd Asaad[3], Rushami Zien bin Yusoff[4]

[1,2,3]School of Technology Management & Logistics, College of Business, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia;

[4]School of Business Management, College of Business, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia

[1]1974fariza@gmail.com; [2]rohaizah@uum.edu.my; [3]mnorhasni@uum.edu.my; [4]rzy278@uum.edu.my

Article Information

Keywords
Inventory Management Performance,
Inventory Management Practices,
Supply Chain Activities,
Public Hospitals,
Drug Management

Abstract

Effective inventory management provides a potential system nowadays to improve performance by matching inventory management practices and competitive advantages in the competitive world. Logistics networks, supply chain activities and inventory management practices are seen as a matter of survival and competitive advantage for an organisation. Studied conducted in the area of inventory management practices revealed that improper management may have been caused by various reasons such as the level of management commitment, the costs incurred and also the level of skills that the workers have. Inventory management across the supply chain is a big challenge for improving coordination among the value chain in the organizations. Controlling inventory is the need of the hour as it formulates the future of the business in terms of its success/failure as competition is intense, growing day-by-day. This research conceptualizes and develops the role of inventory management practices in fostering inventory management performance. The relationships among different variables are proposed to be tested using the quantitative method. The insight from this proposed framework will help the respective Head of Pharmacists in the Malaysian public hospitals and other public or private inventory managers in implementing a proper system of inventory management practices to enhance the overall performance of inventory management.

INTRODUCTION

In the era of globalization and intense competitiveness, the requirement for each organization either private or public services is the need to be effective and efficient in organizing resources and avoiding waste. Seven (7) types of waste as mentioned by Japan and Toyota Production System (TPS) included waste from overproduction, waiting times, transportation & handling, useless & excess of inventories, production process, useless motions and waste from scrap and defects. One of the wastes as mentioned is inventories.While wastage

from the Islamic perspective, based on the Quran and Sunnah are very clearly stated in that avoiding waste and prodigality is a matter of the highest importance. As stated in the Holy Al-Quran where Allah said:

"Indeed the spendthrifts are the brothers of the devils (Satan) and the Satan is ever ungrateful to his Lord".
(Surah Al-Isra 17:27)

Due to that this study intends to conceptualize the factors that focusing in inventory management practices to eliminate inventory waste. Hence, this study on healthcare sectors in Malaysia is due to mismanage of drugs.

ISSUES AND CHALLENGES OF PUBLIC HEALTHCARE IN MALAYSIA

Multiple issues threaten the performance and sustainability of Malaysia's healthcare system against a background of rising health expenditure. Even though the global healthcare industry is among the most dynamic and rapidly growing industries in the world economy, unfortunately the healthcare delivery system in Malaysia has been far from efficient and that there has been a tremendous wastage of resources within the public and private sector*(Country Health Plan – 10th Malaysian Plan, 2011 - 2015)*. Among the current issue that can be highlighted is related to waste and stolen or missing of inventory, is the National Audit Chief Report 2013 on lack of control and administration as tabulated in the following Table 1.1 :

Table 1.1 Location, Types of Inventories and Estimated Cost

Location	Types of Inventories	Estimated Cost
Kuala Lumpur Hospital Nov 2011	**Medicine**	**RM1.21 million**
Kuala Lumpur Hospital Dis 2013	Control Panel model Shimadzu – component to General X-ray	RM300,000.00
Kuala Lumpur Hospital Dis 2013	Aircon compressor, Syringe Pump, Phycologic System and Pulse Oxymeter	RM610,000.00
Pulau Pinang Hospital	**Medicine**	**RM240,000.00**
Pulau Pinang Hospital Feb 2013	**Medicine**	**RM242,125.00**

Table 1.1 above shows that, a total of RM1, 692125.00 lost of medicine due to stolen and mismanage involved medicine. It showed that the situation is critical and needs proper inventory management practices to control it. The medicine or drugs are not properly control and lead to excess of stock. This excess or surplus will lead to the reduction in the number of drugs ready to serve to the patients and due to that, the quality of healthcare would be negatively affected (Kagashe & Massawe, 2012). In viewing that, the healthcare sector must transform to be an extra effective and efficient healthcare providing system in ensuring worldwide explore to healthcare and must speedily react to the changes in products and services in order to be at the forefront on the coming up of advance technologies, and applying innovative processes while substitute past processes (*Country Health Plan - 10th Malaysia Plan*, 2015).

Based on the above discussions, it is noted that public hospitals, as the general healthcare provider, are important contributors to the Malaysian economic growth and in relation to their inventory management practices, it is vital for the public hospitals to move up their service standards to a higher value chain. To do so, this service needs a systematic approach of inventory management practices that would accelerate service (inventory management) performance, thus can lead to excellence in healthcare. As highlighted by Puan Eisah binti A.Rahman, Pharmaceutical Service Senior Director of the Malaysian Health Ministry, the staff concerned must properly manage the inventory through accountability, integrity, and following the current act and rules in order to avoid misconduct, misuse of power and wastage (Pharmaceutical Service Division, 2009).

The study by Anil et.al. (2012) examined that inventories should be allocated without having any waste. However, it was later shown that the pharmacy department faced difficulty in managing the inventory after investing in it (Ali, 2011). Among the reasons that leads to waste and economic inefficiency as highlighted by Romero (2013) are (1) inadequate and incompetent workforce, (2) poor supply chain and the presence of mismatched services, (3) underutilized and unused high end equipment when skilled specialists resigned from the public sector, (4) some hospitals in the public sector had low bed occupancy ratio and (5) lack of clinical quality.

Since drug expenditure is the main component of the hospital's spending, drug inventory management practices is an interesting area to investigate Theptong (2010) and as suggested by Romero (2013), very limited study has

been circulated on the major concerns towards the administration of drugs in public hospitals. Therefore, public hospitals in Malaysia will be the scope of this research in investigating the practices level of inventory management. Based on the above discussion, clearly the study on inventory management practices are highly needed to ensure a better inventory management performance among the public hospitals in Malaysia.

PROBLEM STATEMENT

Inventory management is part of the supply chain and it always being discuss in previous literature. Numerous research was conducted to determine the influence of supply chain with organization performance such as manufacturing (Chalotra, 2013), automobile (Othman, 2012), service logistics (Shams-ur & Tritos, 2008), motor industry (Hussain & Waveren, 2009) retailing (Rajwinder, Sandhu, Metri, & Kaur, 2010) and integrated operations strategy (Kannan & Choon, 2005). Othman (2012) studied on the strategy and practices of supply chain towards performance of supply chain in the automobile industry while (Rajwinder et al., 2010) examined the relationship between practices in managing supply chain towards achieving competitive advantage and organizational performance of retailing. Another researcher looked deeper, Jonsson & Mattsson (2010) studied on the inventory management practices and its implications on perceived planning performance, while Heck, Berg, Davarynejad, Duin, & Roskott (2010) discussed in more detailed in his proposed framework with regard to improving the performance of inventory management with a process-oriented measurement framework. Research done in Malaysia by Agus & Hajinoor (2012) looked to the direction of practices on inventory and supply chain management towards the level of performance in the industry. However, there is limited research focusing on inventory management practices towards inventory management performance (Kagashe & Massawe, 2012).

There is no doubt that inventory needs proper control due to it being the largest asset of a business Singh & Singh (2014) and the balancing of strategy in supply chain , management of inventory and characteristics of the product are highly urgent for the performance operations of an organization (Srinivas, 2013). This issues are in line with the research conducted by Chalotra (2013) where a greater degree of inventory control is important in hourly basis, as it contributes the organizations performance as the challenge is strong, and daily growth.

In the context of business services, particurlarly towards public hospitals in Malaysia, Rossetti (2008) had proposed inventory management implimentation in the hospital as the future research areas. Therefore, the performance measurement that would be addressed in this research is by focusing on three key measures of performance, which are operational performance by Heck (2009), problem-solving performance and decision-making performance by Basaran (2013) under non-financial performance.

Meanwhile, among the inventory management practices that can be highlighted based to previous studies are as tabulated in the following Table 1.2 :

Table 1.2 Proposed Inventory Management Practices

Singh (2013)	Singh & Singh (2014)	Heck et. al.(2010)
support by highest management	current stock counting	improved production process
involvement from staff	managing employees	less faults of master data by single registration
investment in information technology	cyclical counting	improved inventory turnover visibility
vendor development	stock controlling	real-time and advance control of budget
process automation	keeping accurate records	improved ‘three-way-matching” of purchase order
the effectiveness of marketing process	controlling supply and demand	invoice and packing note
production planning & control	managing small items	reliability monitoring of better supplier
supply chain integration		automatic restriction of approved supplier
efficient material plan		improved dead inventory visibility
product cost reduction		less waste
delivery on time		rush orders planning
performance improvement of supply chain		better supplier-contracts registration

Table 1.2 above shows the proposed inventory management practices by Singh (2013), Singh & Singh (2014) and Hect et. al. (2010) for effective inventory management that can enhance the business process performance. However, all these thirty (30) practices are derived from a framework and not empirically tested . After critically reviewing the thirty (30) practices, the current study will take all the practices to be tested by clustering them

into three different groups. The descriptions of groups are falled into: (1) Inventory System and (2) Inventory Control. The groups was form based on the combination of previous literature review and logical analysis.

From the above discussion, it can be concluded that it is important to develop a comprehensive study on inventory management practices and inventory management performance in the context of the public hospitals. Thus, this study will focus on practicing a proper system of inventory management for a better inventory management performance among the public hospitals in Malaysia. Therefore, the objectives for this study are:

(1) to investigate if any relationship exists between inventory management practices and inventory management performance in the public hospitals.

(2) to investigate the most influential inventory management practices (represented by inventory system and inventory control) that may affect the inventory management performance.

LITERATURE REVIEW

Inventory management practices in healthcare segment is more difficult if compared with the rest of the industries due to patient needs accurate service, particularly the sufficient medical supply (Hani, Basri, & Winarso, 2013).This study will look into the following inventory management practices:

Inventory System

Material and supplies are part of inventories that organizations carries for the purpose of sale or as inputs to production process. Therefore, having a good inventory system enable the company to keep track on their inventory level as low as possible at minimum cost. Choosing the right method and appropriate system enable the company to be more efficient (Mohd Lair *et al.*, 2014). A successful business depend on many reasons, one of the factor is a consistent system of inventory management which offers info to smoothly manage the materials, fully utilize people and equipment, communicate with customers and coordinate internal activities. Inventory system is used to analysing product sales, detect popular item in stock and ready to instantly fulfilling any customer's order. It also helps us know which special orders sell on occasion and have those products available in a limited quantity to keep inventory costs down and to develop a positive reputation for quickly filling special orders (Ali et al., 2012).

A good inventory system means that organization have an up to date inventory count at all times, giving good customer service, giving accurate information to customer and improve image of the organizations (Ali, 2011).It is a vital that inventory management system allows managers to receive real time information on inventory. This will assist management to accurately made informed decisions, anywhere, anytime and save time and cost used for labour and thus working on inventory management properly (Mathaba, Dlodlo, Smith, & Adigun, 2011). A properly managed inventory system can considerably improve the firm's performance (Koumanakos, 2008). Without doubt, the upgrade of technology change will increase the expenditure of health care but the best parts and among the benefits from its are technologies become cheaper, faster, mobile and more featured (Medical Development Division, 2011).

Inventory Control

Inventory control in the activity which organizes the availability of items to customers. Inventory enables a company support the customer service, logistic, or manufacturing activities in situations where purchase or manufacture of the items is not able to satisfy the demands. The purpose of the inventory control function in supporting the business activities is to optimize the three targets which is customer service, inventory costs and operating cost (Tony Wild, 2002). Good inventory control means that time to fulfilling and orders stays low (Ali et al., 2012). Thus, material managers are suggest to be more focus and putting attention to the areas of inventory control, process of procurement and relationship towards vendors and physicians. Pharmaceutical department is one of the important department supply medicine to patient. Pharmacy department also one of department using high expenses in the purchase of stock. An inventory control practice in pharmacy is the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum investment (Anil, Aubid, Rashid, A, & At, 2012). The pharmacy department is most often charged with responsibility for managing drug and delivery system costs. The pharmacy management team should focus on developing effective strategies to maximize leverage of drug and human resource cost (Anil et al., 2012).

Inventory Management Performance

Improving the performance of inventory management (drug management) in the Malaysian public hospitals require a good indicator to measure and to support a reduction in wastage. This study will look into the following performance indicators :

Operational performance

Saraste (2013) refers operational performance as the strength and swiftness of the logistic chain. One of the characteristics in the operational performance as mentioned by Bowersox, Closs, & Cooper (2002) is speed and the consistency of the supply chain. Handling inventory especially drug in medical store is very crucial due to drug can save lives of many if it is used in a good way, right time, right quantities, right quality and at affordable cost. Studied done by Kagashe & Massawe (2012) in public hospitals in Tanzania showed that problems of maintaining stocks of drug at the level needs exist in Dar Es Salaam Region hospitals. Among the factors contributing to under stock of drug are lacks of funds, changing treatment guidelines, medicines not commonly used, unexpected increase of patients, small size of warehouse, bureaucracy, not paying supplier on time and procurement procedure too long (Kagashe & Massawe, 2012).

Problem solving performance

Basaran, 2013 states that if the inventory problems can faster be detected, the actions plan for the solution also can quicker be taken. Among the problem solving performance indicators of overcoming the problems as stated by Basaran (2013) are faster determination of the problems, acceptance of it, no hidden agenda, and solving without harm. Thus, ability to solve problems faster in effective and efficient ways is recognized as a performance benchmark before the problems get more and extent all over the whole productions. From the healthcare perspective, due to the hospital pharmacy plays a vital role in patients care, the problem solving performance may become a good indicator for hospitals in general and hospitals pharmacies in reducing operations costs and patient security through inventory management practices towards inventory management performance.

Decision making performance

Decision making related to management of inventory either in public or industries are complicated. Inventory managers are always facing with these situations in their daily operations. As deciders, there are numerous categories of mutually involved systems that need link one another before deciding any decisions and it is behind intuitive power of inventory managers (Basaran, 2013). Among the indicators under decision making performances are faster, logic, scientific, and compliant when the inventory related decisions are being made. More than that, using of computer support, not conflict with other decisions in the organization and the decisions making have to be inform simultaneously to all departments can more contribute to better decision making (Basaran, 2013). Since medicine represents a critical component of healthcare, been notified as not well managed in hospitals pharmacies (Basaran, 2013) and inventory management has an impact on wastage (Stanger, Wilding, Yates, & Cotton, 2012), these study intended allows better decisions making to be made in leading to an improved practices of inventory management towards inventory management performance.

Inventory Management Practices and Inventory Management Performance

Ali (2012) stated that the efficient and effective management of inventories will lead to higher satisfaction level in customers. Thus, the use of proper practices in inventory management especially at hospital pharmacies can enhance inventory management performance of drug management. Study done by Anil et al. (2012) proposed necessary effective and efficient management of drug stores in order to make sure the performance of medicines is high. Among the ideas are efficient priority setting, purchase decision making, specific drug distribution, higher supervision of drugs, and avoiding of pilferage drug.

METHODOLOGY

This study focuses on the descriptive study approach and hypothesis testing of testable relationships between the constructs in order to achieve the objectives. The testable statements will be used to describe the relationship between the study's variables. In order to choose an appropriate research design to answer the above research questions, this study employs several methods, which are non-probability sample, besides consultations with content experts such as the person in charge of inventory in the organization and the lecturers from a local university. The measurement issue in social science research and previous studies from other disciplines were based in reference on the selection of accurate data analysis. Hence this study utilizes descriptive statistics, which is quantitative study design. As this study investigates the relationship between various variables as

depicted in the framework of the study, this research can be categorized as a correlational study. Correlational studies are always conducted in the natural settings, and correlational studies done in organizations are called field studies (Sekaran, 2003). Rasch Analysis Model is suggested for this study as analysis method while WINSTEPS Software as analysis tools.

SIGNIFICANCE OF THE STUDY

There are some significant contributions of this study. Theoretically, this study will look at the ability of the Malaysian public hospitals in implementing the drug management practices, particularly on the implementation process (how) and outcome (what) of the performance. The findings of this study will help the public hospitals, as well as public and private organizations to gain the benefit from the proposed framework. Practically, this study will shed light and provide guidelines to the public and private healthcare or other organizations for better inventory management practices and performance.

CONCLUSION

This study provides substantive support for previous findings in the inventory management practices literature and fresh insight about inventory management. This study will investigate the relationship and the ability between inventory management practices towards inventory management performance. Thus, the result of this finding will help an organization in assessing their level of inventory management practices and also will be a guideline on what they need to do in order to outperform their organizational performance by using a proper inventory management practices as a tool. Hopefully this study will be able to fill in the knowledge gap in the area of inventory management, especially the proper technique of inventory management practices in assisting the organizations to outperform their performance and makes them closer towards achieving business excellence. The empirical research may require further investigation on the study of inventory management practices (drug management) among the private hospitals in Malaysia.

REFERENCES

Agus, A., & Hajinoor, M. S. (2012). Lean production supply chain management as driver towards enhancing product quality and business performance : a case study of manufacturing companies in Malaysia. *International Journal of Quality and Reliability Management*, *29*(1), 92–121.

Ali, A. K. (2011). Inventory Management in Pharmacy Practice : A Review of Literature, *2*(4), 151–156.

Ali, M., Asif, M., Hassan, F., Khan, U., Khan, S., Shahzad, Q., … Khan, J. (2012). Inventory Management and Its Effects on Customer Satisfaction. *Oeconomics of Knowledge*, *4*(3), 11–22.

Anil, M., Aubid, M., Rashid, H., A, S. M., & At, S. (2012). Analysis of Inventory of Drug and Pharmacy Department of a Tertiary Care Hospital, *25*(3), 183–185.

Bahagian Perkhidmatan Farmasi, K. K. (2009). *Garispanduan Pengurusan Stor Farmasi di Hospital & Klinik Kesihatan Kementerian Kesihatan Malaysia*.

Basaran, B. (2013). Effects of Operational and Structural Conditions on Inventory Management in Large Manufacturing Enterprises. *School of Business, Istanbul University*, *42*, 41–60.

Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2002). *Supply chain logistics*. McGraw Hill.

Chalotra, V. (2013). Inventory management and small firms growth : An analytical study in supply chain. *The Journal of Business Perspective*, *17*(3), 213–222.

Hani, U., Basri, M. H., & Winarso, D. (2013). Inventory Management of Medical Consumables in Public Hospital : A Case Study, *3*(2), 128–133. http://doi.org/10.5923/j.mm.20130302.10

Heck, G. van. (2009). *Inventory Management - Introducing A Framework To Assess Operational Performance*. Delft University of Technology.

Heck, G. Van, Berg, J. Van Den, Davarynejad, M., Duin, R. van, & Roskott, B. (2010). Improving Inventory Management Performance Using a Process-Oriented Measurement Framework, 279–288.

Hussain, F., & Waveren, C. C. van. (2009). The implementation of TQM in the Component Supply Chain : A Case Study in the South African Motor Industry. In *PICMET 2009 Proceedings* (pp. 1659–1665).

Jonsson, P., & Mattsson, S.-A. (2010). Inventory Management Practices and Their Impact on Perceived Planning Performance. *International Journal of Production Research*, *46*(7), 1787–1812.

Kagashe, G. A. B., & Massawe, T. (2012). Medicine Stock Out and Inventory Management Problems in Public Hospitals in Tanzania : A Case Of Dar Es Salaam Region, *2*(2), 252–259.

Kannan, V. R., & Choon, K. (2005). Just in time , total quality management , and supply chain management : understanding their linkages and impact on business performance, *33*, 153–162. http://doi.org/10.1016/j.omega.2004.03.012

Koumanakos, D. P. (2008). The effect of inventory management on firm performance. *International Journal of Productivity and Performance Management*, *57*(5), 355–369. http://doi.org/10.1108/17410400810881827

Mathaba, S., Dlodlo, N., Smith, A., & Adigun, M. (2011). The use of RFID and Web 2 . 0 Technologies to Improve Inventory Management in South African Enterprises. *Electronic Journal Information Systems Evaluation*, *14*(2), 228–241.

Medical Development Division, M. O. H. (2011). *Country Health Plan - 10th Malaysia Plan*.

Othman, A. A. (2012). *Hubungan strategi rantaian bekalan dengan prestasi rantaian bekalan di dalam industri automotif di Malaysia*. University Utara Malaysia.

Rajwinder, S., Sandhu, H. S., Metri, B. A., & Kaur, R. (2010). Relating o retail supply chain management practices, competitive advantage and organisational performance. *The Journal of Business Perspective*, *14*(3), 173–190.

Romero, A. (2013). Managing Medicines in the Hospital Pharmacy : Logistics Inefficiencies, *II*, 23–25.

Rossetti, M. D. (2008). *Inventory Management Issues in Health Care Supply Chains*. University of Arkansas.

Saraste, S. (2013). *A Framework for Evaluating Inventory Management in Healthcare Case : HUS Logistics*. Aalto University.

Sekaran, U. (2003). *Research Methods for Business : A Skill Building Approach*. New York: John Willley.

Shams-ur, R., & Tritos, L. (2008). Quality management practices in logistics services. *International Journal Intergrated Supply Management*, *4*(1), 49–58.

Singh, & Singh, R. (2014). Inventory Management Delivering Profits through Stock Management. *International Journal of Research*, *1*(10), 751–757.

Srinivas, R. (2013). Supply Chain Management in Indian Firms : The Road Ahead. *International Journal of Logistics & Supply Chain Management Perspectives*, *2*(1), 100–109.

Stanger, S. H. W., Wilding, R., Yates, N., & Cotton, S. (2012). What Drives Perishable Inventory Management Performance? Lessons Learnt From the UK Blood Supply Chain. *Supply Chain Management: An International Journal*, *17*(2), 107–123. http://doi.org/10.1108/13598541211212861

Theptong, J. (2010). *Drug Inventory Control Case : Thai International Hospital Mahasarakham*. Tampereen Ammattikorkeakoulu University of Applied Sciences.

Tony Wild. (2002). *Best practice in inventory management* (2nd ed.). Wuborn MA: Elsevier Science Limited.