

## **The Effect of Service Supply Chain Management Practices on the Public Healthcare Organizational Performance**

**Lang Ling Yap**

Graduate School of Business  
Universiti Sains Malaysia  
11800 USM, Penang, Malaysia

**Cheng Ling Tan**

Graduate School of Business  
Universiti Sains Malaysia  
11800 USM, Penang, Malaysia

### **Abstract**

*This paper builds on to the previous work done on service supply chain management practices and organizational performance. The aim of this paper is to propose a conceptual framework for examining the relationship between service supply chain management practices and public healthcare's organizational performance that recognizes the mediating effect of alliance integrated network in Malaysia. Supply chain theory such as resource-based view is found to support the conceptual framework. A total of 5 dimensions of service supply chain management practices (information and technology management, demand management, customer relationship management, supplier relationship management, capacity and resource management) were determined to have significant and positive direct relationship with organizational performance. Additionally, alliance network was found to have the mediation effect on the direct relationship. The proposed research framework is applied to Malaysian public healthcare industry which has limited studies.*

**Keywords:** Service supply chain management practices, organizational performance, alliance network, healthcare industry.

### **1. Introduction**

Today, the largest share of Gross Domestic Product (GDP) in developed countries is accounted by the service sector. Above and beyond, the major employment opportunities in developed and developing countries are also largely contributed by service sector (Breen & Crawford, 2004). In Malaysia, the service sector has been the main source of GDP, which contributed to 58% of GDP in 2010 and expanding by 6.8% per annum (Economic Planning Unit and Department of Statistics Malaysia, 2010). It is very apparent that service sector is beginning to gain more importance than other sectors towards Malaysia economy. Malaysia healthcare industry is one of the important service sectors that has a strong potential to compete successfully and to be an earner of foreign exchange. Under the Tenth Malaysia Plan, a recurring theme across National Key Economic Areas (NKEAs) in the context of specialization is the focus on quality and strengthening the value chain. The emphasis on quality as a strategy is reflected in terms of international accreditation of healthcare providers (Malaysia Tenth Plan, 2010).

Healthcare is one of the industries with high potential to contribute further towards Malaysia economy. Therefore, it is important to look into the determinants that will improve healthcare organizational performance. Of the various determinants, supply chain management practices have been viewed as the vital determinant to improve healthcare organizational performance. The supply chain management practices are viewed to be related to supply chain responsiveness which will increase supply chain competitive advantage and then lead to organizational performance (Sukati, Hamid, Baharun & Huam, 2011). The effective supply chain management practices will reduce costs, boost revenues, increase customer satisfaction, and also improve service delivery (Baltacioglu, Ada, Kaplan, Yurt & Kaplan, 2007).

Although there was a study revealed that Malaysia manufacturing and service organizations do not have a significant difference in supply chain management practices (Chong, Chan, Ooi & Sim, 2010), the unique characteristics of service which is different from goods warrant for emphasis to distinguish service supply chain from the generic supply chain (Baltacioglu et al., 2007).

Malaysia expenditure on health as percentage of GDP has been trending upwards from 4.3% in 2008 to 4.8% in 2009. It is also trending higher compared to our neighboring countries such as Indonesia, Thailand, Singapore, Brunei Darussalam and Philippines (Performance Management and Delivery Unit, 2011). The Malaysia Ministry of Health has targeted to increase healthcare expenditure to an estimated 7.0% of GDP by 2020 to match the developed-country standards (Borneo Post Online, 2012). Malaysia Budget 2011 tabled one of the four key strategies was enhancing quality of life for the citizen by allocating RM15.2 billion to build new hospitals, increase number of doctors and nurses, obtain medicines and equipment. Despite all these focuses, there are still a lot of complaints published in local newspapers. The performance of public hospitals is always perceived as low productivity, low efficiency, long waiting time, stressful medical staff, and unhappy patients.

The Sun dated November 7, 2011 has a patron to Raja Permaisuri Bainun Hospital in Ipoh who complained about lack of toilet facility for the disabled patients. The Sun dated July 20, 2010 mentioned about patients in Kuala Lumpur Hospital or University Hospital were given six months to a year for follow-ups. The long waiting time is applied to patients with serious and terminal disease. The news provided a view that Malaysia hospitals cannot cope with current demand due to limited resources including drugs, equipment and professionals as the public healthcare is servicing 80% of the population (The Sun, 20 July 2010). According to the United Nations' figure, the proportion of Malaysia's population aged 65 and above is projected to reach 7.1% in 2020, which is considered an ageing society per the definition from United Nations (The Star, 4 September 2010). The aging society will need more healthcare services which translate to higher usage and higher spending on healthcare (Kowalski, 2009). Against this backdrop, a study on the public healthcare's organizational performance is warranted to determine the predictors.

To achieve corporate strategic objectives, mission and values, organization needs to improve on its organizational performance (Cho, Lee, Ahn & Hwang, 2012). Organizational performance usually involves tasks that establish organizational goals, track progress to achieve goals, and make adjustments to hit those goals. It is an integral part of managing an organization. The possibility of proactively surfacing the performance gaps will mitigate risk that may impact achievement of the defined goals. Past literatures tend to focus on organizational performance extensively in manufacturing industry. The measures of organizational performance usually include financial performance, product sales performance and shareholder return. Business firms may use profits, sales, market share, productivity, debt ratios and stock prices as the measurements (Cho et al., 2012). There are other measures focus on product quality, competitive position and customer service (Lin, Chow, Madu, Kuei & Yu, 2005). The measures used in healthcare industry must truly capture the relevance and essence of the healthcare organizational performance (Cho et al., 2012). According to Mays, Smith, Ingram, Racster, Lambreth & Lovely (2009), the studies on public healthcare organization between 1990 and 2007 focus generally on the aspects of financing, staffing and service delivery. Some specific measures in terms of cost recovery, mortality and morbidity rates, board-certified physicians and occupancy rates can be taken into account in the healthcare organizational performance (Hariharan, Dey, Moseley, Kumar & Gora, 2004).

## **2. Organizational Performance**

Organizational performance refers to how well an organization meets its financial goals and market criteria (Li, Rao, Ragu-Nathan & Ragu-Nathan, 2005; Koh, Demirbag, Bayraktar, Tatoglu & Zaim, 2007). In general, organizational performance can be measured from both financial and non-financial criteria (Demirbag, Koh, Tatoglu & Zaim, 2006). The measures of financial goals include profit, return on investment, sales growth, business performance, and organization effectiveness (Venkatraman & Ramanujam, 1986). On the other hand, the measures of non-financial criteria are innovation performance and market share (Demirbag et al. 2006), quality improvement, innovativeness and resource planning (York and Miree, 2004). Organizational performance is also being studied from the perspective of SCM organizational performance which includes increased sales, organization-wide coordination and supply chain integration (Koh et al., 2007; Petrovic-Lazarevic, Sohal & Baihaiqi, 2007). Operational and organizational performance dimensions may also include innovation and R&D performance (Prajogo & Sohal, 2003; Singh & Smith, 2004).

Many empirical studies have examined the relationship between supply chain management (SCM) and organizational performance (Lee, Lee & Schniederjans, 2011; Zacharia, Nix & Lusch, 2009; Chong, Chan, Ooi & Sim, 2010; Wong & Wong, 2011). The relevant items adopted to measure organizational performance includes higher sales, higher accuracy in costing, and improved coordination between departments, improved coordination with suppliers, and improved coordination with customers (Koh et al., 2007). Some other measures that are related to organizational financial performance may include return on investment, market share, profit margin on sales, growth of return on investment, growth of sales, and growth of market share to measure organizational performance (Wong & Wong, 2011). Petrovic-Lazarevic et al. (2007) use measures such as lead time, inventory turnover, product return, sales level, cost reduction and meeting customers' requirements to measure the operational performance.

Our interest for this study is an aggregate assessment of organizational performance that is relevant to public healthcare sector. The primary service measures of hospital are based on quality of healthcare delivery, cost, promptness, safety, effective and efficient diagnosis and treatment, reduced process/procedure times, internal customer satisfaction, Total Quality Management methodology implementation, technology and innovation, patient relationship management, supplier relationship management, patient satisfaction, speed of recovery, ability to provide efficient service (Acharyulu & Shekhar, 2012). The measures are finally streamlined to key performance outcome measures such as reliability, responsiveness, assets, cost, revenue, customer satisfaction, sustainability and safety (Acharyulu & Shekhar, 2012). This study will adopt the measures from Acharyulu and Shekhar (2012) which are reliability, responsiveness, assets, cost, revenue, customer satisfaction, sustainability and safety. It is important to look into the supply chain management aspects and identify areas in which they can improve public healthcare organizations.

### **3. Supply Chain Management (SCM) Practices**

SCM practices involve a set of activities undertaken in an organization to promote effective management of its supply chain (Koh et al., 2007). The short-term objectives of SCM are to enhance productivity, reduce inventory and lead time. The long-term objectives of SCM are to increase market share and integration of supply chain (Koh et al., 2007). SCM practices can be defined in various ways. Donlon (1996) coined SCM practices as practices that include supplier partnership, outsourcing, cycle-time compression, continuous process flow and information technology sharing. Li et al. (2005) defined SCM practices as the set of activities that organizations undertake to promote effective management of the supply chain. Otto and Kotzab (2003) termed SCM practice as a special form of strategic partnership between retailers and suppliers. Alvarodo and Kotzab (2001) viewed SCM practices in terms of reducing duplication effects by focusing on core competencies and using inter-organizational standards such as activity-based costing or electronic data interchange, and eliminating unnecessary inventory level by postponing customizations towards the end of the supply chain. Koh et al. (2007) categorized SCM practices from the following aspects: close partnership with suppliers, close partnership with customers, just-in-time supply, strategic planning supply chain benchmarking, few suppliers, holding safety stock and sub-contracting, e-procurement, outsourcing and many suppliers. Ellram, Tate and Billington (2007) identified seven theoretical processes of service supply chains which include information flow, capacity and skills management, demand management, customer relationship management, supplier relationship management, service delivery management and cash flow. In general, SCM practices are categorized into demand management, customer relationship management, supplier relationship management, capacity and resource management, service performance, information and technology management, service supply chain finance, and order process management (Chong, et al., 2010).

A synthesis of literature review indicated that the shortcoming of previous studies on SCM relates to their focus on general forms of SCM that are applicable across different type of organizations. To address this limitation, the specific requirement of service organizations urge future researchers to focus on the specific form of SCM which is service SCM practices (Boon-itt and Pongpanarat, 2011). This warrants for further research into the service industry's SCM practices by focusing on public healthcare in Malaysia. In this regard, this study concludes the SCM practices that are suitable to public healthcare, namely information and technology management, demand management, customer relationship management, supplier relationship management, capacity and resource management to be included in the research framework.

#### **4. Alliance Integrated Network**

The healthcare service enterprise is a combination of various product and services such as medical devices, pharmaceuticals, catering, laundry cleaning, medical waste and general waste management, home-care products, vehicle fleet management, and housekeeping. There are various parties involve in a healthcare service enterprise. Thrasher, Craighead and Byrd (2010), reported strategic alliances in healthcare as clusters of organizations that make decisions jointly and integrate efforts to provide a service. The formation of the alliance network is a beginning point of integration and realization of the significant benefits. The benefits can be achieved by integration to promote collaboration and cooperation to improve the quality of medical services, to reduce costs and, in general, to achieve performance improvement and competitive advantage. Therefore, alliance network integration is defined as alliance network capability that is created from the synergistic effect of information technology (IT) where there is seamless access to timely information within and among the network members, and process / decision making integration that allows for collaborative and efficient decision-making within and among the members. Chong, Ooi and Sohal (2009) included IT collaboration tools and supplier relationships in their study as a dimension on supply chain practices. Alvarado and Kotzab (2001) recommended the use of inter-organizational systems such as electronic data interchange in supply chain management. Lee et al. (2011) proposed companies to explore information technologies such as radio-frequency identification (RFID) for transportation tracking and shared databases, and electronic data interchange (EDI) for order placement and invoicing. Zhang, Donk and Vaart (2011) revealed that SCM and performance has a direct relationship as well as indirect relationship via information and communication technology (ICT). In this study, alliance integrated network plays a vital role to intervene the relationship between service SCM practices and organizational performance.

#### **5. Supply Chain Management Practices and Organizational Performance**

Supply chain innovation and efficiency has been found to be positively related to organizational performance. Besides, customer value creation such as efficient data management, reduction in medical error, and speedy processing of patient care were also found to have positive impact on organizational performance (Lee et al., 2011). Kim, Cavusgil and Calantone (2006) stated that SCM practices should shift to integrative in order to value its performance effectiveness. Empirical evidence was provided to show how SCM practices could potentially enhance organization's competitive capabilities such as cost leadership, customer service and product differentiation. Koh et al. (2007) identified that SCM practices have significant direct positive impact on small and medium enterprises' performance. Khang, Arumugam, Chong and Chan (2010) found SCM practices such as leadership, IT adoption, customer orientation and training have significant impact on service organizational performance. Lin et al. (2005) supported the view with results and indicated that SCM practices such as quality management and supplier relationship management improve organizational performance. Effective SCM practices improve organization's market performance and financial performance (Li et al., 2005).

Based on above discussion, organizational performance is closely linked with SCM and would be appropriate in this study and suitable for public healthcare context. A positive relationship for SCM and organizational performance can be proposed. As a result, the following proposition will be explored,

P1: Service Supply Chain Management practices (information and technology management, demand management, customer relationship management, supplier relationship management, and capacity and resource management) will be positively related to organizational performance. With the studies of many scholars regarding service supply chain practices, a meta-analysis is presented as in Table 1 to showcase the detailed list of service SCM practices from different researchers.

**Table 1: Meta-analysis of Service SCM Practices**

SCM Practices/Processes	Donlon (1996)	Tan et al. (1998)	Alvarado & Kotzab (2001)	Li et al. (2005)	Baltacioglu et al. (2007)	Koh et al. (2007)	Ellram et al. (2007)	Chong et al. (2010)	Sundram et al. (2011)	Cho et al. (2011)	Boonitt et al. (2011)	Total Occurance
1 Outsourcing	*					*						2
2 Cycle-time compression	*					*						2
3 Continuous process flow	*					*						2
4 Information & technology mgmt	*			*	*	*	*	*	*	*	*	9
5 Quality		*										1
6 Purchasing		*										1
7 Electronic data interchange			*									1
8 Postponement strategy			*	*				*				3
9 Just-in-time supply						*						1
10 Strategic planning supply chain benchmarking						*						1
11 Few suppliers						*						1
12 Holding safety stock & sub-contracting						*						1
13 e-procurement						*						1
14 Many suppliers						*						1
15 Capacity and skills/resource management					*		*			*	*	4
16 Demand management					*		*			*	*	4
17 Customer relationship management		*		*	*	*	*	*	*	*	*	9
18 Supplier relationship management	*			*	*	*	*	*	*	*	*	9
19 Service delivery management							*					1
20 Cash flow							*					1
21 Service performance management					*					*	*	3
22 Service supply chain finance										*		1
23 Order process management					*					*	*	3
24 Training								*				1
25 Internal operation/lean practices				*				*				2
26 Information quality				*					*			2
27 Agreed vision and goal									*			1
28 Risk and award sharing									*			1

Donlon (1996) identified SCM practices such as outsourcing, cycle-time compression, continuous process flow, information technology sharing and strategic supplier partnership. Tan et al. (1998) studied three practices which were quality, purchasing and customer relationship management. Alvarado and Kotzab (2001) viewed SCM practices in terms of electronic data interchange and postponement strategy. Li et al. (2005) identified six SCM practices namely information flow, postponement strategy, customer relationship management, strategic supplier partnership, internal operation practices and information quality. Batacioglu et al. (2007) identified seven service SCM practices namely information and technology management, capacity and resource management, demand management, customer relationship management, supplier relationship management, service performance management, and order process management. Koh et al. (2007) identified the most number of SCM practices which includes outsourcing, cycle-time compression, continuous process flow, information technology sharing, customer partnership, just-in-time supply, strategic supply chain benchmarking, few suppliers, holding safety stock and sub-contracting, e-procurement, and many suppliers. Ellram et al. (2007) identified seven theoretical processes of service supply chains which include information flow, capacity and skills management, demand management, customer relationship management, supplier relationship management, service delivery management and cash flow. Chong et al. (2010) categorized service SCM practices into information and technology management, information flow, customer relationship management, strategic supplier partnership, training, and internal operation practices.

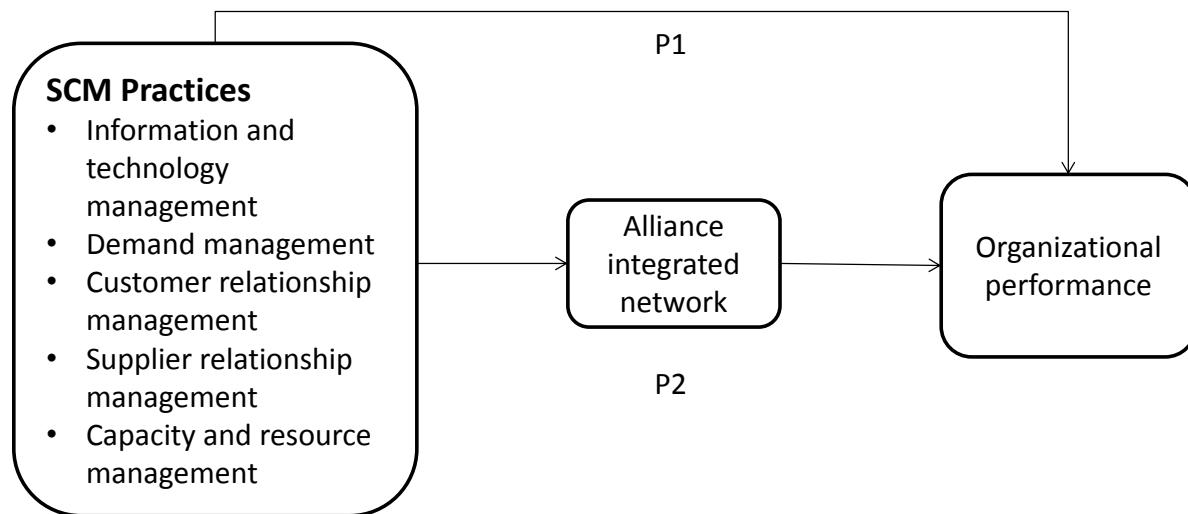
Sundram, Ibrahim and Govindaraju (2011) studied practices such as information flow, postponement strategy, customer relationship management, strategic supplier partnership, information quality, agreed vision and goal, and risk and award sharing. Cho et al. (2011) looked into eight service SCM practices namely information and technology management, capacity and resource management, demand management, customer relationship management, supplier relationship management, service performance management, service supply chain finance, and order process management. Boon-itt and Pongpanarat (2011) adapted the seven service SCM practices from Ellram et al. (2004) which are demand management, customer relationship management, supplier relationship management, capacity and resource management, service performance management, information and technology management, order process management. Based on the detailed analysis, there are five main dimensions of SCM practices widely acknowledged by the researchers as well as suitable to be applied in healthcare industry. These five service SCM practices are information & technology management, customer relationship management, supplier relationship management, demand management, and capacity and resource management. For the purpose of this study, the SCM practices in healthcare industry are conceptualized as a multidimensional construct comprising of the five dimensions mentioned above.

**6. Alliance Integrated Network as a Mediator**

Tukamuhabwa, Eyaa and Derek (2011) found market orientation components such as supplier and customer relationship affect supply chain performance. The supply chain collaboration as a mediator improved the supply chain partners’ operational performance. Boon-itt and Wong (2011) clarified that supply chain integration includes the collaboration of functional departments, suppliers and customers to link and coordinate information flow and processes so that the supply chain is able to achieve on-time delivery. They provided practical guidance to logistics and supply chain managers in terms of the effectiveness of supply chain integration in influencing customer delivery performance. Hence, the position is conceived as below:

P2: Alliance integrated network mediates the relationship between service SCM practices (information and technology management, demand management, customer relationship management, supplier relationship management, and capacity and resource management) and organizational performance.

Based on the discussion of the literatures, the research framework is shown in Figure 1.



**Figure 1: Research Framework**

**7. Underlying Theory**

There is growing amount of empirical literature that supports usage of Resource-Based View (RBV) Theory on the overall performance of an organization (Ray, Barney & Muhanna, 2004). The RBV theory examines the impact of organization resources and capabilities on competitive advantage that leads to overall organizational performance. Based on Ray et al.’s (2004) study, the resources and capabilities that are not conditioned into sustaining activities and business processes will not have positive impact on an organizational performance.

Capacity and resource management is one of the SCM practices dimension studied in this framework. Capacity and resource management is defined as management capacity and resources of service that are organized effectively and operated efficiently at optimal level (Baltacioglu et al., 2007). Therefore, by integrating RVB theory into this study's framework, service SCM practices for public healthcare organization should have positive impact on the organizational performance if the resources and capabilities are conditioned into sustaining SCM practices. The purpose of recognizing competitive advantage has to do with an organization's resources, capabilities and core competencies. Competitive advantage theory recommends nations and businesses to go for policies that create high quality products to be sold at high prices (Wang, Lin & Chu, 2011). Competitive advantage is necessary to satisfy customers by fulfilling customers request (Wang et al., 2011). Demand management is defined as managing and balancing customer demand by keeping updated demand information (Baltacioglu et al., 2007). Customer relationship management is defined as maintaining and developing long-term customer relationships by developing information continuously and understanding what customers want (Baltacioglu et al., 2007).

Demand management and customer relationship management are two dimensions in the service SCM practices studied in this framework. Porter (1985) debated that an organization's strengths can be mapped to two categories which are cost advantage and differentiation. Applying the organization's strengths will result in cost leadership, differentiation and focus. These are the results which will be relevant for public healthcare organization. The differentiator of a public healthcare organization is to provide affordable healthcare to all citizens. The focus is the well-being and quality of life for patients. Good supply chain practices will result in cost leadership due to optimal contracting and supplier relationship management. Supplier relationship management is defined as a process where both customers and suppliers maintain long-term close relationship as partners. The five key components include coordination, cooperation, commitment, information sharing and feedback (Baltacioglu et al., 2007). Therefore, both RBV and competitive advantage theories will glue the five dimensions in service SCM practices with organizational performance in this proposed conceptual framework.

## 8. Discussion and Conclusion

In Malaysia, the public healthcare represents a key component of the fast-growing service industry due to the rising demand of medical. The public healthcare contributes to 78% of hospital beds, 74% of hospital admissions and 55% of doctors available in Malaysia. Therefore, it is important for public healthcare to find way to improve its organizational performance in order to deliver a quality service to the patients. From the theoretical perspective, the Resource-Based View Theory is used to examine the impact of organizational resources and capabilities that leads to overall organizational performance. A review of literature has demonstrated the critical role of service SCM practices in influencing the public healthcare organizational performance. Hence, a conceptual model has been postulated linking a comprehensive service SCM practices (information and technology management, demand management, customer relationship management, supplier relationship management, capacity and resource management) as possible determinants for public healthcare organizational performance. Additionally, since the alliance network integration which is created from the synergistic effect of information technology (IT) may intervenes the relationship between service SCM practices and organizational performance, this variable has been posited as a mediator.

## 9. References

- Acharyulu, G. V. R. K., & Shekhar, B. R. (2012). Role of value chain strategy in healthcare supply chain management: An empirical study in India. *International Journal of Management*, 29(1), 91-97.
- Adcroft, A., & Willis, R. (2005). The (un)intended outcome of public sector performance measurement. *International Journal of Public Sector Management*, 18(5), 386-400.
- Alvarado, U. Y., & Kotzab, H. (2001). Supply chain management: The integration of logistics in marketing *Industrial Marketing Management*, 30, 183-198.
- Baltacioglu, T., Ada, E., Kaplan, M. D., Yurt, O., & Kaplan, Y. C. (2007). A new framework for service supply chains. *The Service Industries Journal*, 27(2), 105-124.
- Boon-itt, S., & Pongpanarat, C. (2011). Measuring service supply chain management processes: The application of the Q-sort technique. *International Journal of Innovation, Management and Technology*, 2(3), 217-221.

- Boon-itt, S., & Wong, C. Y. (2011). The moderating effects of technological and demand uncertainties on the relationship between supply chain integration and customer delivery performance. *International Journal of Physical Distribution & Logistics Management*, 41(3), 253-276.
- Borneo Post Online (2012). Healthcare sector to grow between eight and ten percent per annum. Retrieved March 15, 2012, from <http://www.theborneopost.com/2012/03/23/healthcare-sector-to-grow-between-eight-and-10-percent-per-annum/>
- Breen, L., & Crawford, H. (2004). Improving the pharmaceutical supply chain: Assessing the reality of e-quality through e-commerce application in hospital pharmacy. *International Journal of Quality & Reliability Management*, 22 (6), 572-590.
- Cho, D. W., Lee, Y. H., Ahn, S. H., & Hwang, M. K. (2012). A framework for measuring the performance of service supply chain management. *Computers & Industrial Engineering*, 62(3), 801-818.
- Chong, A. Y. L., Chan, F. T. S., Ooi, K. B., & Sim, J. J. (2010). Can Malaysian firms improve organizational/innovation performance via SCM? *Industrial Management & Data Systems*, 111(3), 410-431.
- Chong, A. Y.-L., Ooi, K.-B., & Sohal, A. (2009). The relationship between supply chain factors and adoption of e-Collaboration tools: An empirical examination *International Journal Production Economics*, 122, 150-160.
- Demirbag, M., Koh, S. C. L., Tatoglu, E., & Zaim, S. (2006). TQM and market orientation's impact on SMEs' performance. *Industrial Management & Data Systems*, 106(8), 1206-1228.
- Donlon, J.P. (1996). Maximizing value in the supply chain. *Chief Executive*, 117, 54-63.
- Economic Planning Unit (2010). *The Tenth Malaysia Plan 2011-2015*. Malaysia. Available at <http://www.epu.gov.my/rmkesepuluh>
- Economic Planning Unit and Department of Statistics Malaysia (2010). *Key Economic Indicators*. Malaysia.
- Ellram, L. M., Tate, W. L., & Billington, C. (2007). Services supply management: The next frontier for improved organizational performance. *California Management Review*, 49(4), 44-65.
- Hariharan, S., Dey, P. K., Moseley, H. S. L., Kumar, A. Y., & Gora, J. (2004). A new tool for measurement of process-based performance of multispecialty tertiary care hospitals. *International Journal of Health Care Quality Assurance*, 17(6), 302-312.
- Khang, T. S., Arumugam, V., Chong, A. Y.-L., & Chan, F. T. S. (2010). Relationship between supply chain management practices and organisation performance: a case study in the Malaysia service industry. *International Journal Modelling in Operations Management*, 1(1), 84-106.
- Kim, D., Cavusgil, S. T., & Calantone, R. J. (2006). Information system innovations and supply chain management: Channel relationships and firm performance. *Journal of the Academy of Marketing Science*, 34(1), 40-54.
- Koh, S. C. L., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management & Data Systems*, 107(1), 103-124.
- Kowalski, J. C. (2009). Needed: A strategic approach to supply chain management. *Healthcare Financial Management*, 63(6), 90-98.
- Lee, S. M., Lee, D., & Schniederjans, M. J. (2011). Supply chain innovation and organizational performance in the healthcare industry. *International Journal of Operations & Production Management*, 31(11), 1193-1214.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *The International Journal of Management Science*, 34, 107-124.
- Lin, C., Chow, W. S., Madu, C. N., Kuei, C.-H., & Yu, P. P. (2005). A structural equation model of supply chain quality management and organizational performance. *International Journal Production Economics*, 96, 355-365.
- March, J. G., & Sutton, R. I. (1997). Organizational performance as a dependent Variable. *Organizational Science*, 8(6), 698-706.
- Mays, G. P., Smith, S. A., Ingram, R. C., Racster, L. J., Lamberth, C. D., & Lovely, E. S. (2009). Public health delivery systems: evidence, uncertainty, and emerging research needs. *American Journal of Preventive Medicine*, 36(3), 256-265.
- Mustaffa, N. H., & Potter, A. (2009). Healthcare supply chain management in Malaysia: a case study. *Supply Chain Management: An International Journal*, 14(3), 234-243.



- Otto, A., & Kotzab, H. (2003). Does supply chain management really pay? Six perspectives to measure the performance of managing a supply chain. *European Journal of Operational Research* 144, 306-320.
- Performance Management and Delivery Unit (2011). *Economic Transformation Programme*. Malaysia. Available at [http://etp.pemandu.gov.my/upload/etp\\_handbook\\_chapter\\_16\\_healthcare.pdf](http://etp.pemandu.gov.my/upload/etp_handbook_chapter_16_healthcare.pdf)
- Prajogo, D. I., & Sohal, A. S. (2003). The Relationship between TQM practices, quality performance, and innovation performance: An empirical examination *International Journal of Quality & Reliability Management*, 20(8), 901-918.
- Petrovic-Lazarevic, S., Sohal, A., & Baihaqi, I. (2007). Supply chain management practices and supply chain performance in the Australian manufacturing industry. <http://www.buseco.monash.edu.au/mgt/research/workingpapers/2007/wp21-07.pdf> (accessed on 22 June 2012).
- Porter, M.E. (1985). *Competitive Advantage*. New York: Free Press
- Ray, G., Barney, J. B., & Muhanna, W. A. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical test of the resource-based- view. *Strategic Management Journal* 25, 23-37.
- Singh, P. J., & Smith, A. J. R. (2004). Relationship between TQM and innovation: An empirical study. *Journal of Manufacturing Technology Management*, 15(5), 394-401.
- Sukati, I., Hamid, A. B. A., Baharun, R., & Huam, H. T. (2011). A study of supply chain management practices: an empirical investigation on consumer goods industry in Malaysia. *International Journal of Business and Social Science*, 2(17), 166-176.
- Sundram, V. P. K., Ibrahim, A. R., & Govindaraju, V. G. R. C. (2011). Supply chain management practices in the electronics industry in Malaysia: Consequences for supply chain performance. *Benchmarking: An International Journal*, 18(6), 834-855.
- Tan, K. C., Kannan, V. R., & Handfield, R. B. (1998). Supply chain management: Supplier performance and firm performance *International Journal of Purchasing and Materials Management*, 34(3), 2-9.
- The Star (September 4, 2010). *Coming to Grips with an Ageing Society*.
- The Sun (July 20, 2010). *National Health Plan still in First Gear*.
- The Sun (November 7, 2011). *Hospital without Toilet for Disabled*.
- Thrasher, E. H., Craighead, C. W., & Byrd, T. A. (2010). An empirical investigation of integration in healthcare alliance network. *Decision Support Systems*, 50, 116-127.
- Tukamuhabwa, B. R., Eyaa, S., & Derek, F. (2011). Mediating variables in the relationship between market orientation and supply chain performance: A theoretical approach. *International Journal of Business and Social Science*, 2(22), 101-107.
- Venkatraman, N., & Ramanujam, V. (1987). Measurement of business economic performance: an examination of method convergence. *Journal of Management*, 13(1), 109-122.
- Wang, W.-C., Lin, C.-H., & Chu, Y.-C. (2011). Types of competitive advantage and analysis. *International Journal of Business and Management*, 6(5), 100-104.
- Wong, W. P., & Wong, K. Y. (2011). Supply chain management, knowledge management capability, and their linkages towards firm performance. *Business Process Management Journal* 17(6), 940-964.
- York, K. M., & Miree, C. E. (2004). Causation or covariation: An empirical re-examination of the link between TQM and financial performance. *Journal of Operations Management*, 22, 291-311.
- Zacharia, Z. G., Nix, N. W., & Lusch, R. F. (2009). An analysis of supply chain collaborations and their effect on performance outcomes. *Journal of Business Logistics*, 30 (2), 101-120.
- Zhang, X., Donk, D. P. v., & Vaart, T. v. d. (2011). Does ICT influence supply chain management and performance?: A review of survey-based research *International Journal of Operations & Production Management*, 31(11), 1215-1247.