MULTIDIMENSIONAL FRAMEWORK FOR PROCUREMENT SELECTION CRITERIA FOR WAREHOUSE MANAGEMENT IN SRI LANKA

Konara, K.M.G.K., De Zoysa, T. S., Rajini, P.A.D. and Vijerathne, M.G.D.T.

Department of Building Economics, University of Moratuwa, Sri Lanka

Abstract

A chain is only as strong as its weakest link. In order to retain the effectiveness and efficiency of a Supply Chain (SC), each segment or the link of the SC require to perform their portion, effectively and efficiently. Modern organisations are in a process of creating innovative concepts and practices in order to obtain the competitive edge among the competitors. Warehouse Management (WM) is one such concept that has been introduced to improve the performance of SC. It plays a major role as the most commonly procured business function over the years, whereas world class companies has identified it as an enabler for improving logistics. However irrespective of the worldwide revolutionary achievements gained by SC and WM, procurement of WM within the Sri Lankan context is still lagging behind. Therefore this research is mainly intended to develop framework which enable evaluating procurement options of WM within the Sri Lankan context.

To achieve the aforementioned aim literature survey and questionnaires survey were used as main data collection tools while Relative Importance Index (RII) method and Analytic Hierarchy Process (AHP) multi-criterion decision making tool were used to analyse data. The scope of the framework extends to both micro and macro environments of the related industry. Thus it comprises the criteria of economic, geographical, technological, quality related, service level, legal and social environment. The findings revealed that there are mainly three procurement methods presence in Sri Lankan WM industry namely in house option, outsource option and semi outsource option out of which outsourcing been the widely accepted method. Economic and geographical criteria became the mainly considered criteria when selecting a WM. the developed framework can be used as a guideline for decision making when procuring WM services for an orgnisation within the Sri Lankan context.

Keywords: Supply Chain Management, Warehouse Management, Outsourcing, Procurement Selection Criteria, Analytic Hierarchy Process (AHP)

1. INTRODUCTION

According to the Ballow (2003), the SC encompasses all the activities associated with the flow and transformation of goods from the raw material stage through to the end user, as well as associated information flows. A typical SC comprises with different links such as suppliers, manufacturing centers, warehouses, distribution centers including transport service

providers, retail outlets and end users. Each level in the process adds value and each stage in the SC is connected through the flow of products (Klobas, 1998). Therefore, each link of the chain should perform in its best to ensure the continuity and efficiency of the whole chain. Accordingly, to make a Supply Chain (SC) efficient and effective, each partner of the chain has to perform efficiently and effectively.

In the modern SC process warehouse is one of the most important elements for linking the chain and it is essential to give out warehouse resources efficiently and effectively to enhance the productivity of the SC (Baker, 2007). In present world, it is difficult to continue ordered production or distribution process without considering the warehousing (Lorentz, 2010). Basically there are two types of procurement options for the Warehouse Management (WM) namely in-house WM and outsource WM (Lieb, 2008; Sangam, 2010; Maini, 2009). According to the argument of Fan (2000), to be competitive in the unpredictable market, organizations are in a real need of focusing more on their core business, reduce total costs and increase the efficiency to their level best (Fan, 2000). To achieve these objectives and organizational goals outsourcing has become an increasingly popular option in many firms.

Accroding to Alwis (2015), the concept of 'Supply Chain Management' is not very well understood, locally, thus resulting in heavy productivity losses. Thus, it is time that businesses and policy makers in Sri Lanka realise the true potential of SCM to achieve competitive advantage by learning from global players and start investing in supply chain professionals to contribute to business and economic growth. Researches related to SCM are limited while only available researches have only looked into processed food, textile, supermarket and tea industries (Liyanage, 2010; Warnakularsuriya and Jayarathne, 2009; Subramaniam, Rahman and Ramachandran, 2007; Jayaratne, Styger and Perera, 2011). The concept of warehouse outsourcing (third party warehousing) is also playing a vital role in Sri Lankan SC. Although various procurement options available for the procurement of warehouses, a standard set of criteria have not been developed for selecting procurement option from the alternative procurement options. Lack of proper decision making framework for procurement of WM within the Sri Lankan context has limited its benefits. Therefore the aim of this research is to develop a multidimensional framework for the procurement selection criteria for WM in Sri Lankan context.

The paper structure begins with an introduction to the study and followed by a literature review on SC, WM and WM procurement. Section four presents factors affecting the selection of procurement options of WM while section five presents the three-steps approach in developing multidimensional framework for procurement selection criteria for WM. The final section summarises conclusions derived from the research findings and recommendations.

2. SUPPLY CHAIN AND WAREHOUSE MANAGEMENT

SC encompasses all the activities associated with the flow and transformation of goods from the raw material stage to the end user as well as associated information flows (Ballow, 2007). Lee (2004) argued that, the best supply chains are not just fast and cost effective, they are also agile, adaptable and they ensure that all their companies' interests stay aligned. According to Council of Supply Chain Management Professionals (2015), Supply Chain Management (SCM) encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. In essence,

SCM integrates supply and demand management within and across companies. According to various researches numerous advantages of SC includes reduction in unnecessary SC cost, increase in customer service expectations, supply and distribution lines are lengthening with greater complexity, addition of significant customer value.

A typical SC comprises with different links such as suppliers, manufacturing centers, warehouses, distribution centers including transport service providers, retail outlets and end users (Klobas, 1998). Warehousing plays significant role within the modern SC (Baker, 2007). Warehouses are used to hold or preserve goods in huge quantities from the time of their purchase or production to their actual use or sale (Baker, 2007). According to the argument of Baker et al. (1989), facilitating movements of goods to the end user in an effective and efficient manner is the main objective of the warehouses. Further the significance of warehouses is highlighted during seasonal production, seasonal demand, large-scale production, quick supply, continuous production and price stabilization. Therefore as a major component which is very common for most of the SC, warehousing should achieve best performances to ensure the overall performance of the SC. Although there various benefits generates from the warehousing function in terms of cost and efficiency it carries several disadvantages as well. Baker (2007) has identified the cost of inventory as being 13% of total SC costs, while warehousing accounted for a further 24% and Baker (2007) has recognized that inventory costs (24%) significantly higher than warehousing cost (22%). Therefore, researcher has identified that warehousing cost / WM cost accounts lager potion of total SC costs in worldwide.

3. PROCUREMENT OPTIONS FOR WAREHOUSE MANAGEMENT

Sourcing (in-house option), and outsource procurement have been identified as the most widely used warehouse procurement options in today's business world. In house option is where an organization has direct ownership to plan, organize and control all functions while outsourcing is contractual agreement between the customer and one or more suppliers to provide services or processes that the customer is currently providing internally (Fan, 2000). However according to the findings of many researchers outsourcing has become most significant business after 1980s. Fan (2000) clarifies some of the factors boosting the popularity of outsourcing option as improving quality, improve level of service, increase flexibility over the process and better facilitate internal and external environment changes. Further, cost reduction was identified as the major reason for out sourcing while better focus of core-activity becomes second priority. However Maini (2009) argues that, outsourcing is something more than cutting costs and saving money, it is about how to do things quickly, more efficiently and reach the market faster than competitors do. Author has mentioned that maximizing flexibility over the workforce and gaining access to highly qualified employees are also key things in outsourcing.

4. FACTORS AFFECTING THE SELECTION OF PROCUREMENT OPTIONS OF WAREHOUSE MANAGEMENT

Different researches have presented numerous factors affecting the selection of procurement options of warehouse management. Cirpin and Kabadayi (2015) presents selection criteria namely service quality, reliability, on-time performance, good communication, customer support, speed of service, flexibility, management quality, willingness to customize and order cycle time. Quality of service, size and quality of fixed assets, the quality of management,

information technology capability, delivery performance, information sharing and trust, operational performance, compatibility, financial stability, surge capacity, geographical spread and range of services, the long-term relationship, reputation and optimum cost have been recognised as the outsourcing criteria by Qureshi et al., (2008).

However these criteria identified within the international context are not always applicable for the Sri Lankan context. Therefore, is an emerging need to identify the influencing factors specific to procurement of WM in the Sri Lankan context in order to develop an effective decision making framework. Taking that requirement in to consideration a preliminary questionnaire survey was carried out among more than 20 industrial practitioners including procurement managers, executives, warehousing specialists. Questionnaire was developed based on the literature review including procurement selection criteria for warehouse management discovered by numerous international researchers. The findings of the questionnaire survey was used to determine the procurement selection criteria for WM in Sri Lanka. Preliminary questionnaire was distributed among industry practitioners who are having more than five years experience within the SCM and warehousing industry.

Based on the preliminary questionnaire survey 95% has mentioned best practice WM option as the outsource option. Additionally, semi outsourced option is also practiced by few logistics companies as a WM procurement method. Main reasons for selecting the outsource method are cost saving and better quality services. Additionally, 60% of industry experts have mentioned having a risk management approach as an added advantage in outsourced option. Remaining 5% has mentioned their less financial capability and loss of managerial control as reasons for practicing in-house option. In order to identify the impact of the factors it was necessary to rank according to their importance. Relative Importance Index (RII) analysis was used to determine the relative ranking of the factors. The results obtained from questionnaire survey were then transformed to importance indices.

According to the final results twenty-eight main procurement indicators were identified as having a significant influence over procurement of WM under the Economic, Geographical, Technological, Quality related, Time related, Legal, Social criteria. According to the findings of RII analysis complexity of the facilities, adaptability to change, quality awards, ability to develop long-term relationships and national market coverage have obtained less than 0.5 RII value. Therefore, above mentioned factors were not used for the detail questionnaire survey.

5. MULTIDIMENSIONAL PROCUREMENT SELECTION CRITERIA FOR WAREHOUSE MANAGEMENT FRAMEWORK DEVELOPMENT PROCESS

The three step approach adapted to develop procurement selection criteria for warehouse management framework is as follows;

(1) Develop hierarchy for evaluating procurement selection criteria for WM
(2) Data analysis using Analytic Hierarchy Process (AHP) tool
(3) Develop multidimensional procurement selection criteria for warehouse management framework

5.1 Develop hierarchy for evaluating procurement selection criteria for WM

In order to design the paired comparison matrices, the AHP decision hierarchy was formed as given in the Figure 1. AHP hierarchy was developed evaluating the procurement selection criteria for WM in Sri Lankan context as the overall objective, WM Procurement Selection Criteria (PSC) as the second level of the hierarchy and WM Procurement Selection Indicators (PSI) as the third level.

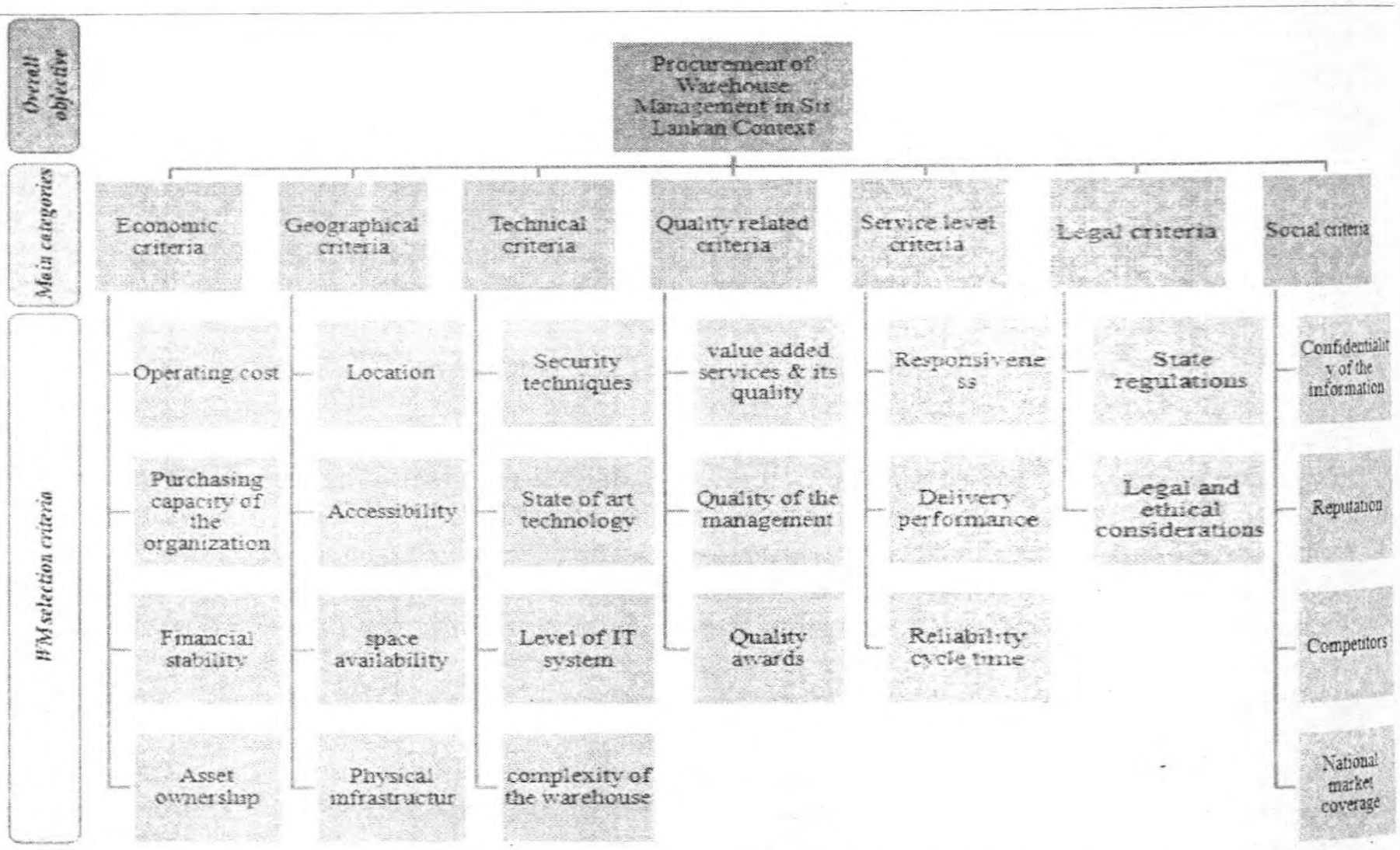

Figure 1: AHP Hierarchy for evaluating procurement selection criteria for WM in Sri Lankan context

5.2 Data analysis using Analytic Hierarchy Process (AHP) tool

A conceptual framework developed using the findings of literature and primary survey. The development of framework includes data collection and analysing using AHP information in order to prioritise key criteria to develop the framework. a detailed questionnaire survey was conducted to prioritise the key performance selection indicators in conceptual framework The general approach of AHP is a pair-wise comparison scheme that results in each criterion having a weight and each decision alternative being scored on each of the criteria. Each decision alternative then gets an overall score, computed as the weighted average of its criterion scores (Ehrhardt and Tullar, 2008). AHP uses simple pair-wise comparisons to determine weights and ratings so that the respondent may concentrate only on two factors at a time. This helped the respondent to recognize the more vital element between a pair. AHP is consisting with set of mathematical calculations mainly focusing three steps. "Pair-wise Comparisons", "Normalize the Comparison" and "Consistency Calculations".

Detail questionnaire was distributed among thirty industry practitioners including procurement managers and warehouse specialists. The respondents were asked to give their individual opinion and indicate the magnitude of the importance placed on procurement selection criteria and procurement selection indicators using the one-to-nine ratio scale. Criterion in each level was compared pair wise with respect to their importance to a criterion in the next higher level and starting at the top of the hierarchy and working down. For all decision alternatives, geometric mean was calculated from the allocated weights by the participants; the mean for each alternative was considered in the analysis. Comparisons in a matrix may not be consistent as in eliciting judgments. This gives rise to multiple comparisons of an element with other elements that leads to numerical inconsistencies. Cheng and Li (2001) concluded that the consistency calculation is a critical component of AHP, and it makes AHP more reliable and useful as decision-making tool. Table 1 shows the pair-wise comparison matrix of PSC developed using gathered data from questionnaire survey for procurement selection criteria for WM. The weightings of Table 1 are then normalized and presented in Table 2. The comparison matrix is normalised by dividing each entry by the sum of the entries in its column. After the normalising the entries in the pairwise comparison matrix, the sums of each row will be calculated. The averages of each row will be calculated in order to obtain the Procurement Selection Score (PSS) which will allow the researcher to compare and prioritise PSC and PSI. The consistency calculations are given in Table 3.

Table 1. Pair-wise comparisons of PSC

Selection criteria	A	B	C	D	E	F	G
Economic criteria	1	0.723	1.53	1.953	2.244	2.732	2.711
Technological criteria	1.383	1	1.607	2.206	2.504	2.962	3.012
Service level criteria	0.654	0.622	1	1.561	1.381	2.121	1.686
Social criteria	0.512	0.453	0.641	1	1.815	2.594	2.223
Economic criteria	0.446	0.399	0.724	0.551	1	3.065	3.234
Technological criteria	0.366	0.338	0.471	0.386	0.309	1	1.312
Service level criteria	0.369	0.332	0.593	0.450	0.326	0.762	1
SUM	4.729	3.868	6.566	8.106	9.579	15.236	15.178

A - Economic criteria; B - Geographical criteria; C - Technological criteria; D - Quality related criteria;
E - Service level criteria; F - Legal criteria; G - Social criteria

Table 2. Pair-wise normalized comparisons of the PSC

Selection criteria	A	B	C	D	E	F	G	Sum	PSS
Economic criteria	0.211	0.187	0.233	0.241	0.234	0.179	0.179	1.464	0.210
Technological criteria	0.292	0.259	0.245	0.272	0.261	0.194	0.198	1.722	0.247
Service level criteria	0.138	0.161	0.152	0.193	0.144	0.139	0.111	1.072	0.149
Social criteria	0.108	0.117	0.098	0.123	0.189	0.170	0.146	0.953	0.137
Economic criteria	0.094	0.103	0.110	0.068	0.104	0.212	0.202	0.894	0.128

Selection criteria	A	B	C	D	E	F	G	Sum	PSS
Technological criteria	0.077	0.087	0.072	0.075	0.032	0.066	0.086	0.496	0.071
Service level criteria	0.066	0.086	0.072	0.043	0.034	0.050	0.047	0.398	0.057
								7.000	

Ehrhardt and Tullar (2008) stated a perspective with a higher performance score is preferred over one with a lower performance score. According to that among the seven criteria, the highest PSS, which is 0.247, holds by the geographical criteria. Therefore geographical criteria are the most significant in the selection of WM. According to the findings of Fan (2000) and Gol (2007) the main criteria of selection of WM was the geographical criteria. Economic criteria gain the second place in the selection of WM with a 0.210 PSS. The third, fourth and the fifth places in selection of WM from importance have been given to the technological criteria (0.149), quality related criteria (0.137) and service level criteria (0.128), legal criteria (0.071), social criteria (0.057) respectively. According to the research, the least important perspective was the Social criteria with 0.031 PSS. According to the research findings of Maini (2009) social related criteria obtained less value than other criteria.

Table 3. Consistency calculations for the PSC

Selection criteria	A	B	C	D	E	F	G	Sum	SUM÷ PSS
Economic criteria	0.249	0.179	0.273	0.243	0.267	0.194	0.187	1.592	7.014
Technological criteria	0.219	0.247	0.240	0.302	0.321	0.211	0.172	1.712	7.045
Service level criteria	0.124	0.254	0.128	0.184	0.121	0.151	0.096	1.058	7.199
Social criteria	0.108	0.112	0.095	0.137	0.233	0.167	0.127	0.979	7.252
Economic criteria	0.094	0.099	0.108	0.165	0.128	0.184	0.175	0.953	7.562
Technological criteria	0.087	0.096	0.070	0.053	0.040	0.071	0.075	0.492	7.026
Service level criteria	0.056	0.042	0.088	0.062	0.042	0.054	0.057	0.401	7.570

$CR = \{(\lambda_{max} - n) / (n - 1)\} \times (1/ RI) = \{(7.238- 7) / (7 - 1)\} \times (1/1.35) = 0.029$

Where CR is Consistency Ratio, n is size of matrix (e.g.: Number of PSC, λ_{max} is the average of SUM/PSS column and RI is Random Index for n number of matrices.

As Saaty, (1994) stated that consistency ratio of 0.10 or less is positive evidence for informed judged, for all the criteria and indicators for the extended model, calculation of CR value and compare with 0.10 to check the consistency. As CR of developed model is 0.029 it can be decided that data used for criteria comparison is consistent. The AHP calculations for all the individual indicators in selection of WM model were similar to the AHP calculation on overall criteria comparison.

(3) Develop multidimensional procurement selection criteria for WM framework

The final output of the AHP tool implementation in this research process is developing the framework for procurement selection criteria for WM with prioritised criteria and prioritised

PSIs. The results of this analysis are presented in Table 4. The second column of Table 4 presents the local priorities representing the relative weights of PSIs with respect to relevant PSC criterion. The overall ranking, shown in the third column of the table, were obtained by multiplying the PSS of the each PSI by the PSS of the relevant PSC.

Table 4. Prioritized criteria for selection a WM

Criteria	PSS	Overall PSS	Overall Rank
Economic criteria	0.210		
Operating cost	0.318	0.066	3
Financial stability	0.256	0.053	6
Asset ownership	0.175	0.036	11
Size of the fixed assets	0.164	0.034	12
Purchasing capacity of the organization	0.084	0.017	17
Geographical criteria	**0.247**		
Location	0.363	0.089	1
Accessibility	0.276	0.068	2
Physical infrastructure of the warehouse	0.241	0.059	5
space availability	0.119	0.029	15
Technological criteria	0.149		
Level of IT system	0.332	0.049	7
State of art technology	0.312	0.046	9
complexity of the warehouse	0.22	0.032	13
Security techniques	0.136	0.020	16
Quality related criteria	0.137		
Ability to provide value added services & its quality	0.445	0.060	4
Quality of the management	0.335	0.045	10
Quality awards	0.22	0.03	14
Service level criteria	0.128		
Responsiveness	0.37	0.047	8
Delivery performance	0.352	0.045	10
Reliability cycle time	0.278	0.035	11
Legal criteria	0.071		
State regulations	0.542	0.047	8
Ethical considerations	0.458	0.045	10
Social criteria	0.051		
Confidentiality of the information	0.6	0.03	14
Reputation	0.287	0.014	18
Competitors	0.113	0.006	19

The geographical and economics criteria hold higher percentages comparative to the remaining criteria where social criteria holds a lower percentage from importance level. As an added advantage, AHP provided the room to compare the criteria and present the importance level thorough a magnitude. Therefore, it can be emphasized that geographical

and economic criteria are relatively two times more important than the other criteria in the selection of WM, the former two criteria are relatively four times more important than social criteria.

According to the PSS of the WM, economic criteria has obtained become second important criteria with 0.210 of PSS. Under this parent category operational cost of the organization was the most important PSI where financial stability (0.256) has become the second important PSI. According to the research done by Morbeg (2004) also emphasises that, operational cost of the warehouse is the most important factor, when selecting a WM. The third and the fourth PSIs from importance level are asset ownership time completion' (0.178) and 'size of the fixed assets (0.164). The results of PSSs indicates that purchasing capacity of the organization (0.084) is at the least in importance.

The outcome of the normalised comparison matrix of geographical criteria gives a remarkable importance to location having a PSS of 0.367. Accessibility (0.276) and physical infrastructure of the warehouse (0.241) have earned second and third positions. According to the research findings of Bhakoo (2007) stated that location is one of the main criteria when selecting WM. Space availability (0.117) PSI has achieved the least importance with a lower PSS. Level of IT performance (0.332) has achieved the highest importance in technological criteria while state of art technology (0.312) and complexity of the warehouse (0.220) have obtained second and third positions respectively. The security techniques (0.136) PSI has earned least importance comparatively with a lower PSS.

The PSS achieved through normalisation process of PSIs in service level criteria has indicated that the reliability cycle time (0.370) as the most vital indicator. It has obtained the highest PSS among others. Responsiveness (0.352) has become the second important PSI while the delivery performance (0.278) has become the least important. The quality related criteria normalised comparison matrix presents quality of the management (0.445) as the most significant PSI while quality awards (0.335) and value added services and its quality (0.220) have become the second and third respectively. According to the outcomes of PSIs in legal criteria through normalisation, the state regulation (0.542) has become the most vital PSI while ethical consideration (0.458) has become the least. Confidentiality of the information (0.600) was the most important PSI in social criteria while Level for reputation (0.287) and number of competitors (0.113) have arrived at second and third places respectively.

6. CONCLUSION AND RECOMMENDATIONS

With the evolution of businesses, various business strategies are practiced by the organizations to achieve its ultimate goals and objectives effectively and efficiently. Not only that it remarks, those strategies are key points for many commercial organizations to cope with its competitors and survive in the dynamic business world. With the increasing globalization and developing concepts such as global sourcing, SC have a tendency to experience comparatively longer supply lead-times (Baker, 2007 and Ballow, 2007).When, the distance from supplier to customer increase it generally increases the lead time of the supply process (Baker, 2007). To cope with this issue warehousing becomes a crucial part (Baker, 2007).

There are number of factors that directly affects the selection of suitable WM procurement option from the available resources. However, a systematic decision making criteria for

procurement of WM have not been identified within the Sri Lankan context. Therefore, this research is intended to develop a decision support model to select most effective procuring method for within the Sri Lankan context. To achieve the aforementioned aim a step by step approach has been followed. Identification of the relevant selection criteria for the WM was the initial step. Thoroughly carried out comprehensive literature survey has identified 28 PSIs under seven PSC. Identified criteria and indicators were further refined through a comprehensive preliminary questionnaire survey making them more adaptable within the Sri Lankan context. The conceptual framework developed using the results of the RII analysis consisted of 23 indicators and seven main PSC. This conceptual model was the foundation of the developed the framework and AHP hierarchy.

AHP, the multi-criteria decision making tool provided opportunity to prioratise PSC and PSIs in order to identify most and least SC and PSIs. The process itself provided relative weights for each criterion while examining the consistency of data. The second and final questionnaire survey was carried among 22 industrial professionals in warehousing and SC industry as the next step of developing a framework to evaluate the procurement selection criteria for WM. according to the findings of the AHP analysis geographical, economic, technological, service level, quality related, legal and social criteria were ranked form most to least importance respectively. The analysis of responses revealed that geographical and economic criteria in WM hold higher levels of importance with compared to the other criteria in selection of WM. Although some industry practitioners accepted the social criteria as an important aspect of procurement selection of WM, the final analysis proved otherwise. Framework ranked location as the most important PSI in geographical criteria while operating cost for Economic criteria. Level of IT performance has become more important in technological criteria while reliability cycle time became the most important PSI in service level criteria. Quality of the management earned the highest PSS in quality related criteria while state regulation and reputation became most important PSIs in legal and social criteria respectively.

The procurement scores in prioritised selection of WM framework give a clear idea about the relative acceptance levels of importance. Therefore the developed framework can be used as a guideline for decision making when procuring WM services for an orgnisation within the Sri Lankan context. With the increasing globalization and developing concepts such as global sourcing service providers has the capability of achieving the competitive edge though giving proper consideration for the relevant criteria and indicators.

REFERENCES

Alwis, G.D. (2015). Sri Lankan Government and Corporates Need to Focus on Modern Supply Chain Systems [online]. Available from: http://bizenglish.adaderana.lk/sri-lankan-government-and-corporates-need-to-focus-on-modern-supply-chain-systems/ [Assessed 24 October 2015]

Baker, P. (2007). An exploratory Framework of the Role of Inventory and Warehousing in International Supply Chains. *The International Journal of Logistics Management*, 18(1), 64-80

Baker, P., Croucher, P., & Rushton, A. (1989). *The Handbook of Logistics and Distribution Management*. 3rd Ed. Great Britain: Kogan Page Ltd

Ballow, R.H. (2007). The Evolution and Future of Logistics and Supply Chain Management. *European Business Review*, 19 (4), 332- 347

Bhakoo, V., Power, D., & Sharafali, M. (2007). Adding Value through Outsourcing Contribution of 3PL Services to Customer Performance. *Management Research News,* 30 (3), 228-235

Cheng, E.W.L., & Li, H. (2001). Information Priority Setting For Better Resource Allocation Using Analytic Hierarchy Process (AHP). *Information Management & Computer Security*, 9(2): 61-70

Cirpin, B.K., & Kabadayi, N. (2015). Analytic Hierarchy Process in Third-Party Logistics Provider Selection Criteria Evaluation: A Case Study in IT Distributor Company, *International Journal of Multidisciplinary Sciences and Engineering,* 6(3).

Council of Supply Chain Management Professionals. (2015). CSCMP Supply Chain Management [Online]. Available from: https://cscmp.org/about-us/supply-chain-management-definitions [Assessed 3 October 2015]

Ehrdardt, R., & Tuller, W.L. (2008). Rating Recruiting Sources at Simtec Instruments Corporation: Applying Multiple-Criterion Decision Making In an HR Setting, *Journal of Human Resources Education*, 2(1), 1-11

Fan, Y. (2000). Strategic Outsourcing: Evidence from British Companies. *Marketing Intelligence and Planning,* 18 (4), 213-219

Gol, H., & Catay, B. (2007). Third-Party Logistics Provider Selection: Insights from A Turkish Automotive Company. *Supply Chain Management: An International Journal,* 12(6), 379-384

Jayaratne, P., Styger, L. & Perera, N. (2011). Sustainable Supply Chain Management: Using the Sri Lankan Tea Industry as a Pilot Study. 25th Annual Australia New Zealand Academy of Management Conference (ANZAM 201), 1-22 New Zealand: ANZAM.

Klobas, J. (1998). The Virtual Supply Chain View of Information Flows, Business Structures and Business Opportunities. *Business Information Review*, 12(3), 185

Kroeker, J. (2009). The Financial Reporting Chain Is Only As Strong As Its Weakest Link. [Online]. Available from: http://www.ifac.org/sites/default/files/ downloads/4.2-James_Kroeker-sec-financial-reporting-chain-strong-as-weakest-link-final.pdf [Accessed 10 October 2015]

Lee, A.H.I., Chen, W.C., & Chang, C.J. (2008). A Fuzzy AHP and BSC Approach To Evaluating Performance Of IT Department In The Manufacturing Industry In Taiwan, *Expert Systems with Applications,* 34, 96-107

Lieb, R. (2008). Invited View Point The Year 2007 Survey Provider CEO Perspectives On The Current Status And Future Prospects Of The Third Party Logistics Industry In The Asia-Pacific Region. *International Journal of Physical Distribution and Logistics Management,* 38 (6), 495-512

Liyanage, H.L. (2010). An Empirical Investigation of Inventory Management Practices of Processed Food Supply Chain in Sri Lanka-Manufacturer's Perspective: A Case, Proceedings of the 2010 International Conference on Industrial Engineering and Operations Management Dhaka, Bangladesh, January 9 – 10, 2010, 248

Lorentz, H., & Hilmola, O.P. (2010). Warehousing in Europe - Northern Actor Perspective. *International Journal of Physical Distribution and Logistics Management,* 37 (8), 670-697

Maini, L.A. (2009). Find An Outsourcing Company And Watch Your Business Grow [Online]. Available from: http://sbinformation.about.com/cs/bestpractices/a/outsource_2.html [Accessed 12 October 2015]

Moberg, R.C., & Spech, W.T. (2004). Third Party Warehousing Selection: Comparison Of National And Regional Firms. *Mid-American Journal of Business,* 19(2), 71-77

Qureshi, M.N., Rahman, Z., & Talib, F. (2010). A study Of Total Quality Management and Supply Chain Management Practices. *International Journal of Productivity and Performance Management*, 60 (3), 268-288

Sangam, V. (2010). Supplychainworld: Supply Chain Optimization [online]. Available from: http://vijaysangamworld.Wordpress.com/2010/09/10/best-of-breed-warehouse-performance/ html [Assessed 3 October 2015]

Subramaniam, B., Rahman, F. & Ramachandran, P. (2007), Supply Chain Management Practices And Their Applicability In Sri Lanka's Supermarkets, Proceedings of International Conference on Business Management, 4

Warnakularsuriya, B.N.F. & Jayarathne P.G.S.A. (2009). Application of Supply Chain Management (SCM) Principles in Sri Lankan Garment/Textile Industry, *Sri Lanka Journal of Humanities and Social Sciences,* 1(2)