Procurement Performance and Supplier Management Measurement Issues: A Case of Malaysian Private Company

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***Abstract*— The rising material and operational cost for manufacturers in medical device industry is of concern to many organizations. As such, it is imperative to measure the procurement and supplier's performance for competitive advantage and provide a framework to stakeholders for continuous improvement. This paper develops a procurement and supplier performance measurement system at a firm by conducting a review of literature in procurement performance measurement and supplier performance measurement. Through the key components of supply chain together with the resources, procedures and output, a model was developed. Additionally, a system was established with a set of generic measures and six perspectives. The case study conducted at the firm applies to the model developed to describe the procurement department within the supply chain activities. Results indicate that supply chain department has already made a good progress in measuring procurement process through the implementation of supplier development program. Few areas that needed to be measured include cycle time of delivery, order processing time, effectiveness, efficiency and reliability. While a lot of hard work was involved, the advantages of establishing a measurement system outweigh the costs and efforts involved in its implementation. Results of key performance index measurements provide stakeholders with critical information on efficiency and effectiveness of the procurement department's work.**

***Keywords*—** *Procurement, Performance, Manufacturing, Supply Chain, Measurement*

1. Introduction

Globalization has gained much attention in today's business environment, with businesses going multinational in operations. However, this trend is characterised by several challenges whereby cost is key and customers are expecting lower cost products without compromising on quality [1]. Similar scenario is experienced within the medical device industry, and it was further compounded by regulatory requirements for medical products. With increasing ageing population around the world and stringent government regulatory frameworks, medical products companies are expected to cut medical expenditure cost [2]. Hence, it is important that continuous improvement activities such Kaizan, lean operation, effective and efficient supply chain are embarked upon by manufacturers to mitigate the rising cost of operation and continuously improve their product cost [3].

Vijay & Shetkar, [4] argues that majority of product cost is locked in the materials. This explains why efficient supply chain management is important for organizations to attain competitive edge in their business environment. So, operation and supply chain excellence plays a vital role in reducing the product cost. In the same manner, the application of supply-chain best practices from other industries could be used to significantly improve the inefficiencies in the health care supply chain [5]. However, it is important to note that prior to the introduction of any change efforts (like supply-chain best practices) in an organization, there is a need to assess the current performance in supply chain system and develop a suitable performance measurement system specific for the organization.

This study examines an integrated performance measurement system within a supply chain organization and specifically focuses on the procurement department. At the same time, empirical data is acquired via a case study conducted at a company (which, for purposes of

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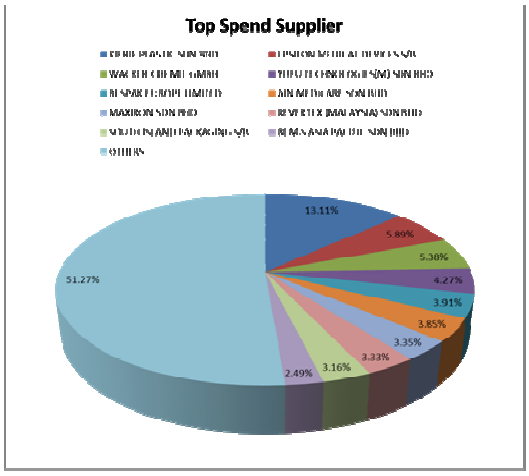
confidentiality, will be referred to as ABC Sdn Bhd) through interviews, direct observation and data gathering during participatory actions.

ABC Sdn Bhd purchases EURO 30 million worth of direct and non-direct materials yearly to supports its five business unit operations. These purchases require great details of management skills to manage the supply chain activities. The company's main function is to efficiently manage the supply chain activities through cost-effective means of sourcing, procuring, inventory management and distribution. The strategic procurement section manages all sourcing, supplier selection, contracts management and ordering activities to meet internal customers' demands, and coordinates and compiles all orders to gain economies of scale. Figure 1 shows the company's spending by suppliers and commodities.



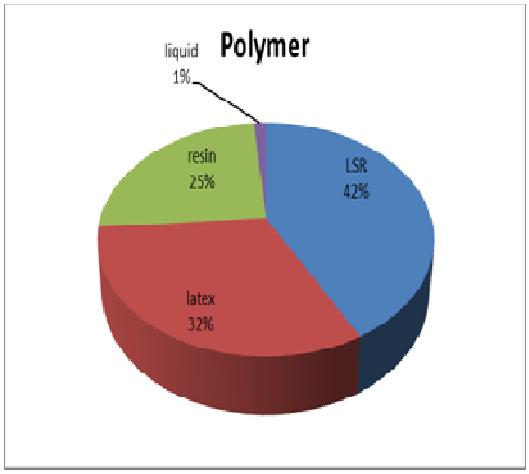
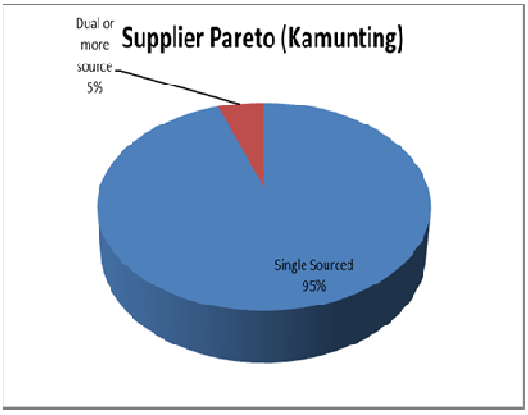


Figure 1. Spending by top suppliers and commodities

Further analysis into the procurement data of the company reveals that its supply chain depends on single source of supplier for majority of its purchases. This situation renders the company in a vulnerable position and at the supplier's mercy where competitive pricing is impossible. In recent years, the company's supplier kept increasing prices making the company's products costing uncompetitive in the market. Figure 2 shows the percentage of single source suppliers and the commodity they represent. At 95% single source, organizations can hardly survive.



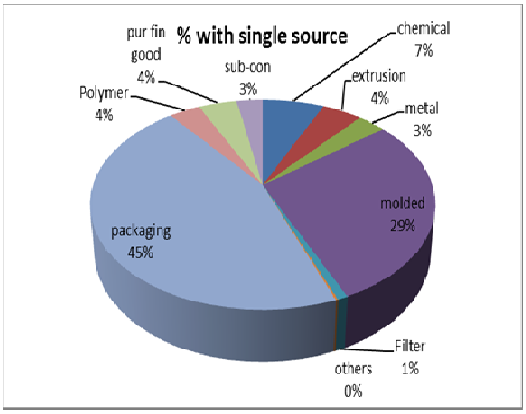


Figure 2. ABC Sdn Bhd single source data and their respective commodities.

A deep dive into procurement supplier management shows that risk mitigation measures is needed. Data gathered shows that majority of the company's suppliers are in high risk categories, while only few are in strategic position. This situation has huge implication on procurement efficiency and procurement performance. Figure 3 shows the risk level of supplier at ABC Sdn Bhd.

Figure 3. Risk level of suppliers at ABC.

Evidently, there is poor supplier selection and supplier performance management system. And, the poor quality from business unit was never taken into consideration in the quality data management and incoming quality data is not an inclusive data management. The system also reveals poor tracking system compounded with poor participation. The data is taken only from materials department and incoming quality team. The supplier management does not exhibit any long term relationship exercise or long term collaboration with suppliers.

Despite these shortfalls, the supply chain department has dedicated workforce but also requires guidance and training, proper structure and system. Thus, an inclusive Key Performance indicators (KPIs) is needed considering all the issues issue highlighted.

2. Literature review

There has been a wide discussion on the definition of supply chain management, procurement and purchasing, and logistic department within organizations. Each of these definitions has minor inconsistencies but they seem to be describing the same core idea of material flow management in and between facilities which includes product vendors, manufacturing plants and distribution centres for the sole goal of meeting customer needs [6].

However, in the present day dynamic market environment, intense competition is driving businesses towards product innovation and efficient services to the market, which requires higher flexibility in order to meet the changing needs of the customers [7]. Van Weele [8] attempts to sort out the confusion by drawing the differences as illustrated in Figure 4. Procurement includes all activities required in order to get the product from the supplier to its final destination, whereas purchasing covers all activities for which the company receives an invoice from outside parties.

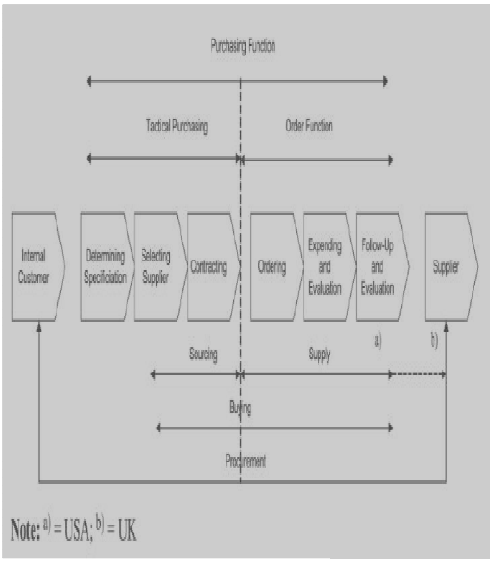


Figure 4. Description of the concepts

Achieving procurement excellence requires a thorough understanding of the key definitions that are related to procurement performance. These elements are efficiency and effectiveness. [9]. While efficiency refers to how organization successfully converts the raw materials into usable and outputs, effectiveness is how organization successfully designs their system to achieve the intended desired output.

Procurement department works with internal customers internally and also works with suppliers externally for them to deliver procurement excellence. Their links is described in figure 5.

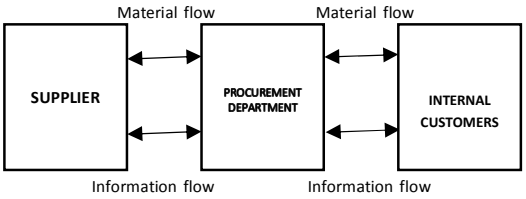


Figure 5. Links between procurement, supplier and internal customers.

The link is important as this allows the company's stakeholders to make the right decisions

which can impact on the performance of overall supply chain activities. Hence, this case will analyze the impacts of this links to performance of procurement department in these three main areas:

(1) Representation of the supply link
(2) Efficiency of the supply link
(3) Effectiveness of the supply link.

To further analyze the relationship between the link in term of efficiency and effectiveness, a generic performance indicators of the supply link in terms of time, quality, flexibility and cost are used. Resources are scarce; and it is in everyone's interest to maximize the utilization of these resources. Van Weele [8] recommended measurement areas that are derived from effective and efficient purchasing, as indicated in Figure 6. The effectiveness of the supply link explains how well the objectives are achieved. So, the supplier relationship and procurement performance house model is used in figure 7. Seven key rating area (KRA) will be measured as part of this case study which is listed in figure 7.

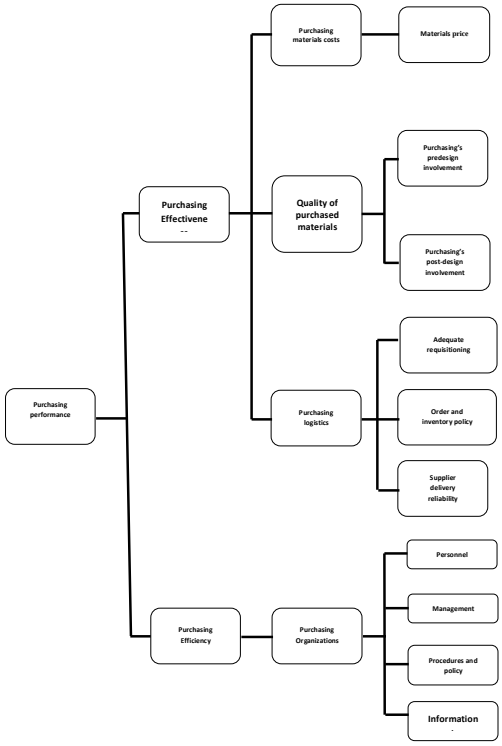
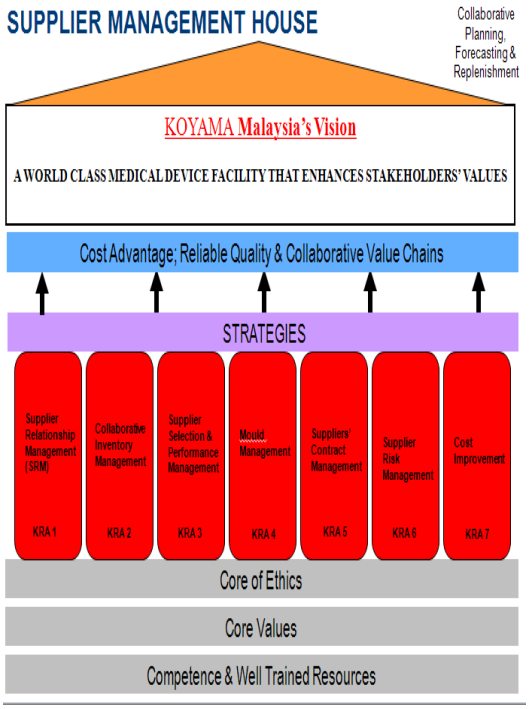


Figure 6. Key areas of purchasing performance measurement.
Source: Van Wede (2000)



ABC Sdn Bhd Vision

Figure 7. Supplier Management House.

3. Procurement performance measurement model

As pointed out in figure 5, procurement activities comprises of material and information flow from external suppliers to internal customers. While procurement activities is constantly changing in intensity, duration and quality, thus producing variations in performance, efficiency and effectiveness, its performance always varies according to global commodities prices such as fuel, gold, rubber and currency fluctuation which determine cost factors in any region [10, 11]. Understanding the PESTEL analysis is key in order to deliver customer satisfaction. This also implies that a strategic plan for acquiring external sources is required, operating procedures have to be designed, customer needs have to be fulfilled and supplier markets must be surveyed in advance.

Hence, it is imperative to have multiple measurement indicators in measuring procurement performance model. Basic generic model would include time, quality, operational costs, delivery reliability, contract accuracy, continuous improvement and partnership just to name few. The list can be expanded as the organization needs.

Thus, procurement performance measurement system for the medical device manufacturers industry must cover the following components [5] Kumar et al (2005):

- Environment and structure of the purchasing department; Operating procedures; and
- Generic measures for the supplier, purchasing department and internal customers.

Figure 8 illustrates how a good performance model should be executed. It should encompass resources, procedures and output. The outputs are the objectives of the department and the degree of customer satisfaction.

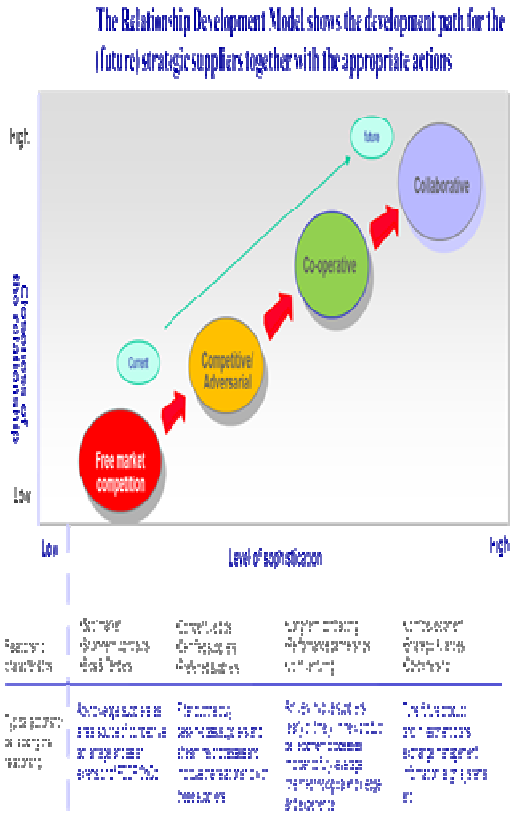


Figure 8. Performance Model

At the end of analysis a proposal has been introduced to measure four key main areas of strategic, bottleneck, leverage and non-critical with seven subsets of measurement areas as listed in Table 1. This table enable organization to build relationship with suppliers based on their respective positions with the organization. The table also helps organizations to measure performance of procurement department.

Through relating structure, procedures and generic measures, a deeper understanding on procurement performance and supplier relationship can be developed.

	STRATEGIC	BOTTLE NECK	LEVERAGE	NON CRITICAL
Procurement Activities / Commercial	Share Market Inteligence	Establish Business Continuity Plan(Contigency Plan)	Leverage Volume	Transactional Relationship
	Price revision Mechanism(cost model)	Develop Alternative/ Substitutes	Total Cost(Including Logisics ,duties ans currencies)	Possibilities to Outsource
	Business Plan -Mid Range (Management Involvement)	Provide Forecast and Visibility		Procurement Activities
	Business Growth Participation	Confidentiality Enforcement		Consolidation(Volume and supply)
	Confidential Enforcement			Phase out Tail End Suppliers
Contracts	Long term (Global / Regional)	Long to Midterm Agreement	Short to Midterm agreemnt	PO or Price List as Contracts
	Define and Enforce KPI's	Define and Enforce KPI	Regular Request For Quote(RFQ	
		Potential exclusivity with supplier	Define and Enforce KPI's	
		Volume, Scale benefit and capacity agreement		
Level Of Intergration and Collaboration	Full Transparency	Potential for vertical Intergration	System Intergration (EDI-VMI)	Meeting when there is an issue
	Potentiol Vertical Intergration	Invest for Project Development	Biannual Business Review	Strive for transaction Efficiency
	Set Common Priorities	Biannual Business Review		
	Share Cost Benefits			
	Quaterly Business Review			
	Define Governance Model			
	System Intergration (EDI-VMI)			
Innovation and Product Development	Encourage Co-Development	Establish Joint Development	Encourage Service Development	None
	Put In Place Exclusivity	Put In Place Exclusivity		
	First Right Of Refusal			
Management Interaction	Senior Stakeholders	Senior Procurement Representive	Senior Buyers Involvement	Buyers / Sales Representitive
	Senior management meetings	Senior Business Stakeholders meeting	Senior Managemevt when needed	No/ Limited Managemnet Involvement
	Interaction Across Organization			Limited Stakeholder Involvement
Objective , Scope and Content	Long Term Relationship	Pro-active relationship	Negotiations	Smooth Operation
	Value Creation	Build up relationship	Price/ TCO	Minimise Efforts
	2 way Communications	Provide feedback/ Minimise Effort	Performance Management	Content Transactional
	Information Sharing	Simplyfy communication	Targets and Escalation Process	Opportunities for consolidations
Channels , Tools and Technologies	Meeting	Meeting	Automated Process	Automated Process
	System Intergration (EDI-VMI)	E-mail, Phone, Fax	Meetings	Framework Contract
	E-mail, Phone, Fax	Workshops	E-mail, Phone, Fax	E-Commerce
	Workshops		E-commerce(Auctions)	E-mail, Phone, Fax

Table 1. Procurement performance and relationship.

4. Methodology

This case study was conducted at ABC Medical Device. The area of study was generally on its supply chain department with focus being given to

procurement department performance and their relationship with their suppliers.

ABC medical is US based company headquartered in Pennsylvania, U.S.A. They focus on products such as vascular access, respiratory care, general and regional anaesthesia, cardiac care, urology and surgery. They serve customers in 150 countries with revenue of USD 1.8 billion. They focus on medical technology products that enhance clinical benefits, improve patient and provider safety and reduce total procedural costs. In Malaysia they employ 2000 employees with 50 headcount in supply chain department. ABC Sdn Bhd serves mainly on three main medical sectors. They serve the hospitals and medical care providers, medical device manufacturers and home care sector. Their revenue contribution is represented in figure 6 below.

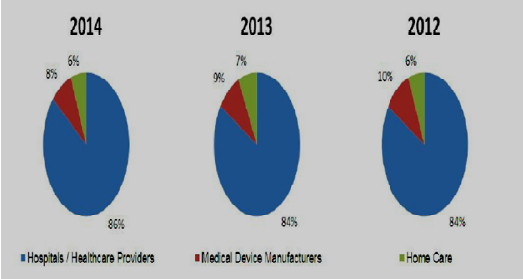


Figure 9. Market Segment Served By ABC Sdn Bhd.

5. Discussion

The procurement and supply chain department of the organization has realized certain shortcomings. The management has invested in dedicated staffs and efforts in overcoming the issues. Few area of improvement and key focus area has been identified as specified in figure 7. In line with ISO 13485, ISO 31000: 2009, ISO 14000 and ISO 9001, ABC needs to implement few performance management tools, supplier audit and selection program, supplier partnership and collaboration program, continuous cost improvement programmes, supplier review board and many other effective tools in order to gain more competitive advantage within the in global market.

Few area of improvement that they can utilize is listed below:-

1. Supplier selection and performance management program- utilizing below matrix.

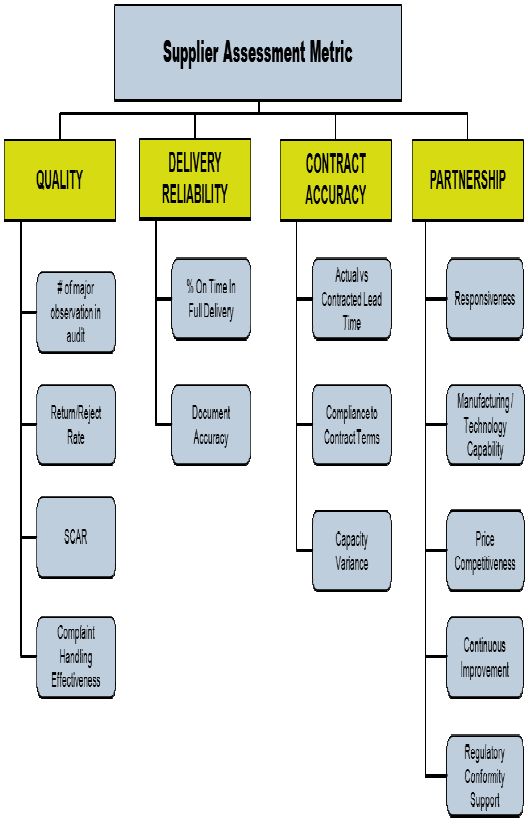


Figure 10. Supplier Assessment Matrix.

The organization utilizes MFG PRO as their MRP backbone. They are connected to supplier through manual PO and forecasting method. Heavy investment in IT system is needed. Few other sister manufacturing facilities are already embarked on SAP 6.0 system which has EDI capability. Extending this system will definitely enhance the efficiency and performance of supply chain department.

Although there was a lot of hard work involved, it was found that it was worthwhile to establish a procurement performance measurement system for ABC Sdn Bhd, as the advantages outweigh the drawbacks. However, this case study involves one of the largest sites in Malaysia but it does not cover the rest of the manufacturing sites. Hence, it should not be assumed that it represents entire ABC manufacturing system precisely in every aspects, since the findings are based on only one site.

6. Conclusion

In order to have an effective supply chain performance organization must employ strategies for measuring and improving the performance of supply network participants. Strategies combined with effective measuring tools and supported by good IT support will help any organization to excel in their daily routine work. Commitment from management is vital as some of the IT infrastructure requires huge investment. All measurement system should be diligently measured and senior management team get involved in reviewing the performance at least on monthly basis.

Communication is key between the purchasing department, internal customers and suppliers as customers provide useful feedback on purchased products and suppliers allow the organization to modify products to suit its needs [5]. However, not all involved in SCM network (customers, focal organization and suppliers) invest in the latest technology. Therefore, incompatibilities might exist between the systems used by the organization and its suppliers.

7. Recommendation and Future work

The case study would assist any organization, especially the SCM team for effectively manage suppliers and measure the department and supplier performance. As majority of spending in any organization involved in material purchases having effective management system will save the organization money and time which will help them in long term sustainability.

As technologies, customer expectations and supply chain management is rapidly evolving and more and more new strategies will emerge in future. Hence it is best for the organization to constantly monitor the progress and keep adapting to evolving theories, strategies and technologies.

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