INTRODUCTION

Malaysia’s manufacturing sales value rose 2.6 % or RM43.78 billion in June 2007 from RM42.66 billion registered in the same month last year (Department of Statistics). Contribution from manufacturing sectors in GDP shows that manufacturing has become the second most important sector in the Malaysian economy which accounted for RM47, 458 billion (Department of Statistics). Electrical and Electronic (E&E) Industry remain the main contributors from manufacturing sector to Malaysia’s GDP. In addition, E&E products, valued at RM125.2 billion remained the largest export revenue earner which was valued at RM22.4 billion or 38% of total export. However, competition in the electronics industry is fierce, driven by decreasing technological innovation cycle time. Therefore, methods for implementing and controlling production have changed. Players along the supply chain have undertaken critical roles in a firm’s competitive advantage (Sudarjat, 2007). Thus, as pointed out by many researchers, competition is no longer so much among firms, but among supply chains.

Supply Chain Management (SCM) is the strategic management of all the traditional business function that are involved
in flows, upstream or downstream, across any aspect of the supply chain system (Mentzer, 2004). It consists of all parties involved, directly or indirectly, in fulfilling a customer request (Chopra and Meindl, 2007). A supply chain is an interrelationship, through which information, physical goods, and services flow back and forth (Kim, 2005; Mentzer, 2004), consisting of business entities that undertake value-creating activities (Kim, 2005; Harrison et. al, 2003) involved in supplying necessary materials, transforming various supplies into valuable goods and services, and distributing the final outputs to customer markets (Harrison et. al, 2003; Altekar, 2005; Kim, 2005). Thus, it can be conclude that SCM is the study of how to manage the supply chain in an optimum way to create the maximum value for the customers (Kim, 2005; Altekar, 2005). Therefore, to create effective supply chains, companies need to make both strategic and operational decisions on their sourcing, factories, and distribution centres, according to criteria such as, convenience, customer and supplier locations, and future needs (Goh, 2005).

Globalisation of business environment and international competition has forced more multi-national companies to disperse geographically in their supply chains, and there is an increasing part of the value added which is placed outside the company’s own production facilities. As a consequence of globalisation of supplier and customer markets, domestic and local suppliers play a less important role compared to global suppliers and customers (Skjoett-Larsen, 2000). Due to cost savings and comparative advantages of the less developed countries, raw material sourcing, production, and other backroom are often conducted in different countries (Goh, 2005). This makes the centralised coordinating and planning functions at the headquarters much more challenging. As companies realise the importance of creating an integrated relationship with their suppliers and customers, supply chain management has become an importance issues to firms.

Supply Chain management is an issue in many industries, as companies realise the importance of creating an integrated relationship with their suppliers and customers (Cristine Marie Geiger, 1997).
Therefore, managing the supply chain has become a way of improving competitiveness by reducing uncertainty and improving service. However, many firms may not realise the importance of SCM to their competitiveness.

Supply Chain body of knowledge is primarily based on US and European best practice and case studies. However, given the constraints of local environments, supply chain best practices are not easily implemented in Malaysia. Many supply chain practices are not yet be ready for implementation or be easily carried out in Malaysian environments such as cross-docking, merge-in-transit, or JIT which necessitates a high level of coordination, automation, and timeliness. Therefore, companies have to make their own local adaptation to implement best practices approach.

A review of published literature shows that, to date, a number of studies have been conducted to determine the supply chain management practices in specific countries or specific industries; McMullan (1996), Zairi (1998), Gilmour (1999), Ahn et.al (1999), Andersen et. al (1999), Skojett-Larsen (2000), Battezzati and Magnani (2000), Keah (2002), Kemppairen and Vepsalainen (2003), Sahay and Mohan (2003), Basnet et.al (2003), Li et. al (2004), Altekar (2004), Chin et. al (2004), Chee et. al (2005), Mollenkopf and Dapiran (2005), Chow et. al (2006), Storey et. al (2006), Sahay et. al (2006), Zhou (2007), and Robbet et. al (2007). Most studies have been devoted to developed countries rather than on developing countries. Moreover, to date, a little study has been conducted to examine supply chain practices in Malaysia particularly in E&E industry. Despite the evidence about the importance of supply chain management, we know relatively little about these practices in this industry in Malaysia.

Therefore, this study is a descriptive study that seeks to assess the level of adoption of Supply Chain Management Practices in Electric and Electronic Industry. Different supply chain strategies need the support of different management practices. Hence, the same practices cannot ensure good performance for companies that implement different supply chain strategies.
The focus of this study was only limited to E&E Industry in Malaysia. In addition, only E&E companies located in Johor was chosen as the respondents in this survey.

LITERATURE REVIEW

The objective of SCM is to improve a company’s competitive position in the global marketplace and to sustain that despite competitive forces and rapidly changing consumer needs. In addition, SCM serves to develop and manage a coordinated flow of goods and services from the raw material stage through to the final customer. One important aspect of successfully managing the supply chain requires that a company understand its own logistical strategies and practices, in addition to those of its buyers and suppliers. Firms require clear strategic thinking when they intend to effectively organise such complicated activities, resources, communications, and processes (Yinn, 2006).

A SCM practice is defined as “the set of activities undertaken by an organisation to promote effective management of its supply chain” (Li et al, 2006). Li et al (2006) also proposed SCM practices as a multi-dimensional construct that includes both upstream and downstream sides of the supply chain. SCM practices are expected to create added value in numerous ways: reduced paperwork, reduced inventory cost, increased customer service (Balsmeier and Voisin, 1996; Sengupta and Turnbull, 1996), improved quality, faster delivery, better availability, stronger competitive advantage (Patterson, 1995), and increased agility of an organisation (Prater et. al., 2001). Many organisations are now beginning to recognise that SCM is the key to building sustainable competitive edge for their products or services in an increasingly crowded marketplace (Jones, 1998). According to Zhou and Benton Jr (2007), a group of supply chain practice is regarded as effective supply chain practice if the selected best practices have been implemented. This study adopts the same practices as proposed by Li (2002); strategic supplier partnership, customer
relationship, information sharing and postponement.

**Strategic Supplier Partnership** is defined as ‘the long-term relationship between the organisation and its suppliers. It is designed to leverage the strategic and operational capabilities of individuals participating organisations to help them achieve significant ongoing benefits (Li et al., 2006, p. 109). Gunasekaran et. al (2001) states that a strategic partnership emphasises long-term relationship between trading partners and promotes mutual planning and problem solving efforts. According to Li, et. al (2006), by developing strategic partnership with suppliers, it is possible to work more effective with a few important suppliers who are willing to share responsibility for the success of the products. Collaborative relationships by organisations with a few trusted suppliers (Anderson et. al., 1994; Sheth and Sharma, 1997) add that firms are moving from traditional approach of a onetime cost based relationship with many suppliers to long term relationships with a few good suppliers. According to Wisner (2003), immediate relationship activities play a vital role in developing effective SCM strategies. Therefore, long-term relationship does not refer to any specific period of time, but to the intention that the arrangement is not going to be temporary (Chen and Paulraj, 2004).

Li, et. al. (2006) defined **customer relationship** as “the array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers, and improving customer satisfaction. The key in customer relationship is to understand and meet customers’ needs and requirement. Good relationships with trading partners, including customers are key to successful SCM efforts by organisation (Moberg et al, 2002). Close customer relationship allows product differentiation from competitors, helps sustain customer loyalty, and elevates the value provided to customers (Magretta, 1998).

**Information sharing** is defined as “the extent to which critical and proprietary information is communicated to one’s supply chain partner” (Li et al., 2006). Shared information can vary from strategic to tactical in nature and from information about logistics activities to general market and customer information (Mentzer, 2000). As cited
by Thatte (2007), Information sharing refers to the access to private data between trading partners thus enabling them to monitor the progress of products and orders as they pass through various processes in the supply chain. The elements of Information sharing comprises of data acquisition, processing, storage, presentation, retrieval, and broadcasting of demand and forecast data, inventory status and locations, order status, cost-related data, and performance status (Simatupang and Sridharan, 2002). However, there is reluctance on the part of organisations in the supply chain to share information with each other. As asserted by Vokurka & Lummus (2000), information is generally viewed as providing an advantage over competitors, and organisations resist sharing with their partners.

**Postponement** refers to the practice of moving forward one or more operations or activities (making, sourcing and delivering) to a much later point in the supply chain (Li, 2002). Yang, et al (2004) defined postponement as a strategy that intentionally delays the execution of a task, instead of starting it with incomplete or unreliable information input. This strategy is widely used by many firms such as Toyota and HP. Postponement allows an organisation to be flexible in developing different versions of the product as needed, to meet changing customer needs, and to differentiate a product or to modify a demand function (Waller et al., 2000). Researchers suggest that postponement has the potential to improve responsiveness while reducing inventory, transportation, storage, and obsolescence costs (Yang et al, 2004).

**RESEARCH METHODOLOGY**

To fulfil research objectives, a survey questionnaire has been employed to investigate the supply chain practices in organisations. The survey research is a “well-known” methodology that has been used by most researchers to explore the core issues in the Operation Management area (Malhorta and Grover, 1998; Rungtusanaham et.al, 2003).
The population of this study are 251 E&E companies in Johor. However, only 159 companies have been chosen randomly as the respondents in this survey (Based on the table of Isaac and William (1981)).

Considering the content of this study, the supply chain manager, operations manager, and general manager were the respondents of this study. These persons in such level have enough knowledge to answer the questions asked in the questionnaire especially the ones concerning competitive methods and supply chain management practices used in the company.

The instrument on supply chain management practices was adopted from Li, et. al (2006) and Thatte (2007). There are 4 components in this framework. The components are strategic supplier partnership, customer relation practices, postponement and information sharing. Items from the questionnaire were using Likert Scale. Table 1 shows the scale and level of agreement in this scale.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Level of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not applicable</td>
</tr>
<tr>
<td>1</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>2</td>
<td>Disagree</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
</tr>
<tr>
<td>4</td>
<td>Agree</td>
</tr>
<tr>
<td>5</td>
<td>Strongly disagree</td>
</tr>
</tbody>
</table>

Table 1: Likert-scale – level of agreement

FINDINGS AND DISCUSSION

Demographic of the respondents
A total of 159 questionnaires were distributed to E&E firms in Johor. Only 45 or 28.3% questionnaires were returned. However, only 77.78% of the respondents were the adopter of supply chain management practices and the remaining of 10 firms were non-adopter firms. Therefore, the analyses were based on 35 firms.

![Role of firm in SCM](image)

**Figure 1: Role of firms in supply chain management network**

Figure 1 shows that 74.3% of the respondents were the major player in supply chain management network whereas only 25.7% were the subordinate in this network.

<table>
<thead>
<tr>
<th>Position of firm</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>100</td>
</tr>
<tr>
<td>Component supplier</td>
<td>5.7</td>
</tr>
<tr>
<td>Assembler</td>
<td>5.7</td>
</tr>
<tr>
<td>Sub-assembler</td>
<td>5.7</td>
</tr>
</tbody>
</table>
Table 2: Position of firms in the supply chain

A company can be positioned at or near the initial source of supply (raw material and component supplier), or be at or near the customer (distributor / wholesaler / retailer), or somewhere between these end points of the supply chain (assembler and manufacturer). From the surveyed organisations, all respondents are manufacturer. Out of the total manufacturers, 5.7% were represented by component suppliers, assembler and sub-assembler. The results from table 2 and figure 1 show that majority of the respondents were the major player in their supply chains because all of them are the manufacturers. However, some of the respondents were also in the forward and backward positions of their chains.

Table 3: Manufacturing pattern of the respondents
Table 3 shows the various patterns of manufacturing in respondent’s firm. The highest manufacturing pattern were make-to-order (54.3%) followed by Assembly-to-order (31.4%). Only 17.1% of respondents used buy-to-order strategy in their manufacturing operations.

**Supply Chain Management Practices**

This section will discuss the supply chain management practices in E&E Industry in Johor. The items in this section applied the Likert-Scale Rank to determine the level of agreement of respondents on each items.

Descriptive statistics (Mean) was used to determine the level of adoption/practices of respondents in supply chain management practices. Mean was classified in three levels of practices; low, medium and high. The classification of mean is shown in table 4 below.

<table>
<thead>
<tr>
<th>Mean</th>
<th>Level of Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 – 2.33</td>
<td>Low</td>
</tr>
<tr>
<td>2.34 – 3.66</td>
<td>Medium</td>
</tr>
<tr>
<td>3.67 – 5.00</td>
<td>High</td>
</tr>
</tbody>
</table>

*Table 4: Classification of mean*

There are four components in the section of supply chain management practices which are strategic supplier partnership, customer relation practices, postponement and information sharing.

*Strategic supplier partnership*
Table 5 shows the practices of respondents in strategic supplier partnership’s components. Strategic supplier partnership is the long-term relationship between the organisation and its suppliers. It is designed to leverage the strategic and operational capabilities of individuals participating organisations to help them achieve significant benefits.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>We rely on a few dependable suppliers</td>
<td>3.80</td>
<td></td>
</tr>
<tr>
<td>We rely on a few high quality suppliers</td>
<td>3.91</td>
<td></td>
</tr>
<tr>
<td>We consider quality as our number one criteria in selecting suppliers</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>We include our key suppliers in our planning and goal-setting activities</td>
<td>4.03</td>
<td></td>
</tr>
<tr>
<td>We have continuous improvement programs that include our key suppliers</td>
<td>4.09</td>
<td>High</td>
</tr>
<tr>
<td>We actively involve our key suppliers in new product development processes</td>
<td>4.09</td>
<td></td>
</tr>
<tr>
<td>We regularly solve problems jointly with our suppliers</td>
<td>4.11</td>
<td></td>
</tr>
<tr>
<td>We have helped our suppliers to improve their product quality</td>
<td>4.14</td>
<td></td>
</tr>
<tr>
<td>Average mean score</td>
<td>4.04</td>
<td></td>
</tr>
</tbody>
</table>

**Table 5:** Strategic supplier partnership practices

Based on the above table, the level of practices of all items in the strategic supplier partnership component were high. The lowest mean score was the dependability to suppliers (mean score 3.80). Items that obtained the highest mean score (4.14) was regarding firms helping their suppliers to improve the product quality. This is due
to the fact that improvement in the quality of suppliers’ product will
directly improve the quality of firm’s product. Average mean score
of all items was 4.04 and can be categorised as high practices.

E&E practices on the strategic supplier partnerships can be regarded as high practices. This is due to the fact that strategic supplier partnerships with suppliers enable organisations to work more effectively with a few important suppliers who are willing to share responsibility for the success of a product. Suppliers participating earlier in the product design process can render more cost-effective design choices, develop alternative conceptual solutions, select the best components and technologies, and help in design assessment (Monezka et al, 1994). In addition, strategically aligned organisations can work closely together and eliminate wasted time and effort. Therefore, effective supplier partnerships can be a critical component of a leading edge supply chain (Noble, 1997).

Customer Relation Practices

Table 6 shows items in customer relation practices component. Customer Relation Practices is the entire array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with the customers, and improving customer satisfaction.
Supply Chain Management Practices in Malaysian Manufacturing Firms

### Table 6: Customer Relation Practices

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>We facilitate customer’s ability with our customer</td>
<td>3.31</td>
<td>Medium</td>
</tr>
<tr>
<td>We periodically evaluate the importance of our relationship with our customers.</td>
<td>3.69</td>
<td></td>
</tr>
<tr>
<td>We frequently interact with customers to set reliability, responsiveness, and other standard for us</td>
<td>3.77</td>
<td></td>
</tr>
<tr>
<td>We frequently evaluate the formal and informal complaints of our customers</td>
<td>4.11</td>
<td>High</td>
</tr>
<tr>
<td>We have frequently follow-up with our customer for quality/service feedback</td>
<td>4.26</td>
<td></td>
</tr>
<tr>
<td>We frequently measure and evaluate customer expectations</td>
<td>4.31</td>
<td></td>
</tr>
<tr>
<td>We frequently determine future customer expectations</td>
<td>4.31</td>
<td></td>
</tr>
<tr>
<td>Average mean score</td>
<td>3.97</td>
<td>High</td>
</tr>
</tbody>
</table>

Results from this survey showed that the statement “we facilitate customer’s ability with our customer” had only medium level of adoption amongst E&E firms (3.31). However, the rest of the items in this component had the high level of practices in E&E firms. Personalized attention and better relationship management with individual customers is the most importance for organisation success. Good relationships with supply chain members, including customers, are needed for successful implementation of SCM programs (Moberg, et.al, 2002). Customer relationship have long been recognised as
an internal component of an organisation’s marketing strategy to increase sales and profit (Bommer et al., 2001). Due to close customer relationship, it allows an organisation to differentiate its product from competitors, sustain customer loyalty, and dramatically extend the value it provides to its customers.

**Postponement Practices**

Table 7 shows results in the postponement practices component. Postponement is a practice of moving forward one or more operations or activities (making, sourcing, and delivering) to a much later point in the supply chain.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>We delay final product assembly activities until customer orders have actually been received.</td>
<td>3.69</td>
<td></td>
</tr>
<tr>
<td>We delay final product assembly activities until orders have actually been received.</td>
<td>3.77</td>
<td>High</td>
</tr>
<tr>
<td>Our products are designed for modular assembly</td>
<td>3.77</td>
<td></td>
</tr>
<tr>
<td>Our production process modules can be re-arranged so that customization can be carried out later at distribution centres.</td>
<td>3.83</td>
<td></td>
</tr>
<tr>
<td>Average mean score</td>
<td>3.77</td>
<td>High</td>
</tr>
</tbody>
</table>

**Table 7: Postponement Practices**

The survey showed that the level of practices of postponement in E&E firms was high. The adoption of postponement by organisations can help them control inventory risks such as obsolescence and
logistics costs. In addition, the high level of adoption of this practice was due to the fact that there are more sophisticated consumers, growing product varieties and shortening product life cycles. Thus, postponement is a potential tool to reconfiguring the entire supply chain. The adoption of postponement could be applied in the following conditions: innovative product, product with high monetary density, high specialization and wide range, high demand uncertainty and manufacturing or logistics systems with small economies of scales (Pagh and Cooper, 1998).

**Information Sharing Practices**

Table 8 shows the practices of information sharing among E&E firms in Johor. Information sharing is the extent to which critical and proprietary information is communicated to one’s trading partner.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>We and our trading partners exchange information that helps establishment of business planning.</td>
<td>3.69</td>
<td></td>
</tr>
<tr>
<td>We and our trading partners exchange information that helps establishment of business planning.</td>
<td>3.71</td>
<td>High</td>
</tr>
<tr>
<td>We inform trading partners in advance of changing needs.</td>
<td>3.77</td>
<td></td>
</tr>
<tr>
<td>Our trading partners keep us fully informed about issues that affect our business.</td>
<td>3.83</td>
<td></td>
</tr>
<tr>
<td>Our trading partners share business knowledge of core business processes with us.</td>
<td>3.94</td>
<td></td>
</tr>
<tr>
<td>Average mean score</td>
<td>3.77</td>
<td>High</td>
</tr>
</tbody>
</table>

**Table 8:** Information sharing practices
The results from this study showed that the level of practices in information sharing component was high. In order to make the supply chain competitive, a necessary first step is to acquire a clear understanding of supply chain concepts and be willing to openly share information with supply chain partners. Supply chain partners that exchanged the information on a regular basis are able to work as a single entity because they had a greater understanding of the end customers and were better to respond to change in the marketplace. Moreover, the impact of bullwhip effect on supply chain could be reduced by sharing information with trading partners.

However, there is reluctance on the part of organisations in the supply chain to share information with each other because they viewed it as providing an advantage over competitors (Vokurka & Lummus, 2000).

CONCLUSION AND RECOMMENDATION

It is interesting to observe that the implementations of most of SCM practices components in E&E firms in Johor were high. This implies that E&E firms seemed to be making progress towards SCM implementation. SCM involves suppliers, manufacturers, distributors, retailers and customers. Thus, in building customer-supplier relationships, developing and maintaining trustworthy and positive relationships, transfer of accurate information and open communication across the supply chains, engaging in joint problem solving and conflict resolution, sharing cost reductions and efficiency gains, and focus on long-term commitment are important operational factors.

This study is limited to the E&E industry. This could limit generalisation of results to other industry types. Future research can be extended to the study for other industry types to enhance generalisability. In addition, future research can study SCM issues at the supply chain level. It is fascinating to investigate the various
practices and how the various practices differ across supply chains operating in different industries. Moreover, comparisons can be made between supply chains to identify the strengths and weaknesses of each supply chain and the best common SCM practices across the supply chain.

REFERENCES


Battezzati, L. and Magnani, R. (2000). “Supply Chains For FMVG And Industrial Products In Italy – Practices And The...


