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Supply Chain Intelligence Practices among Small Medium Enterprises in Malaysia

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ABSTRACT

Small and medium sized enterprises (SMEs) are the economic backbone of many countries. In order to survive and compete in dynamic markets, SMEs need supply chain intelligence (SCI) as a structured tool to gather and analyse information of business activities and the market environment. However, studies on the concept are scare, in particular its application to the SME sector. This research study examines the level and extent of SCI practices among SMEs and their impact on their competitive advantage and business performance respectively. In order to assess these, a survey was conducted among 813 SME owners and managers from various business sectors and subsectors. Results showed that majority of the SMEs have the right culture and some form of intelligence activities including formal intelligence unit. These measures were developed with top management support. By emphasising its importance among employees, SCI activities will improve SMEs' competitive advantage and performance.

Keywords: Competitive Intelligence, Supply Chain Intelligence, Competitive Advantage, Performance

INTRODUCTION

Intelligence is an amalgam of economics, marketing, military theory, information science and strategic management (Juhari & Stephens, 2006). The internet era that began in 1990s may have led to the notion of intelligence being something entirely new or even revolutionary. It became an important operational term that encapsulated all activities which involved monitoring and acting upon data and information to predict future events and use them for effective strategies to achieve competitive sustainability (Stefanikova &

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Masarova, 2014). However, supply chain intelligence (SCI) extends the definition by including supply chain activities for a comprehensive view. In other words, SCI includes analysis, synthesis, and monitoring of information about self, competitors, supply chain activities, and related stakeholder environment that will be transformed into strategic knowledge (Jaharuddin, Mohamed & Sambasivan, 2015).

It is acknowledged that all businesses do collect intelligence information; however, the practice is not structured well nor optimally done in SMEs (Calof, 1999; Calof & Wright, 2008; Chang et al., 2011; Yap & Rashid, 2011). A study by Groom and David (2001) shows that small businesses are less likely to engage in formal or structured intelligence activities and are generally less informed about macro environmental conditions than older or larger firms. This may be the reason why there is a lack of research on intelligence by SMEs (Saayman et al. 2008; Smith et al., 2010; Yap & Rashid, 2011, Nenzhelele, 2014). Studies have also found that the practice of gathering intelligence would have impact positively on SMEs because every unit of money spent is to ensure their survival in the market, which allows no room for mistakes (Calof, 2003; Frion & Yzquierdo-Hombrecher, 2009; Smith et al, 2010). It becomes all the more important because SMEs face many challenges and are easily preyed upon by larger firms. Since they are prone to financial difficulties and challenges related to human resources, there is a need to examine the state of SME SCI practices in acquiring and analysing intelligence in making effective business decisions.

According to a report by ASEAN (2012), SMEs represent more than 95% of all business enterprises and they play an important role in economic development of a country. In Malaysia, 99.2% of total business establishments are SMEs (SME Directory, 2014). Many government policies have focused on SMEs, s one of the main agenda of the 10th Malaysia Plan (Malaysia, 2011 – 2015). This is to ensure their competitiveness in any industry. The SCI can be used as a vehicle and mechanism to be adopted to enhance the competitive advantage of SMEs to face a myriad of global challenges (Hughes, 2005; Za & Chen, 2009; Gilad, 2011). There is a critical need to include SCI in businesses, especially SMEs, in order to stay ahead of competition and support Malaysia's goal to achieve a high-income nation status. Although there are studies that highlight the benefits of SCI and firm performance (Jaworski & Wee, 1993; McGonagle & Vella, 1996; GIA, 2004; Badr et al., 2006), not much research has been done to determine the impact of SCI on SMEs. It is hoped that the findings of this study could help improve the competitiveness and business performance of SMEs and ultimately, Malaysia's economy.

This study emphasises the importance of SCI as a strategic tool to create, accumulate and disseminate intelligence which is

deemed essential for SMEs to improve their performance and economic growth. Therefore, the objectives of this study are:

(i) To examine how SMEs manage their SCI activities.

(ii) To find out to what extent SCI contributes to SMEs's competitive advantage.

(iii) To study to what extent SCI contributes to SMEs's performance.

LITERATURE REVIEW

SMEs and managing SCI

Successful integration and collaboration strategies among supply chain partners are important to succeed in business. The SCI provides a broader view of intelligence on the dynamic relationship of supply chain integration in making better business decisions. It covers the organisation's internal process and external environment to include supply chain partners. The SCI has been viewed as a new initiative that allows firms to leverage on internal and external information assets by applying the discipline and ethics of intelligence process to the operations of a global supply chain for making better business decisions (Wilkins, 2007). The SCI is defined as "a set of systematic intelligence process about opportunities or developments that have the potential to affect the individual firms and their supply chain network as a whole towards improving long-term performance" (Jaharuddin et al., 2014; 2015). In other words, SCI provides an analysis of the implications of marketplace change by detecting, anticipating and understanding the competitive environment and supply chain relationship that aids corporate leadership in strategic decisions (Fahey, 2007; Gilad, 2011). In fact, without realising it, SCI approach has been used by many organisations to improve their organisational performance and enhance competitiveness in the marketplace.

SCI as competitive advantage of SMEs

The modern business environment is characterised by stiff competition, rapid technological advancements, and changing requirements of customers and employees. In order to grow and survive in this turbulent environment and advanced technology, SMEs must invest in long-term competitiveness. The SME owner-managers must make informed decisions to survive in the competitive environment (Temtime, 2008). The effort to gain a competitive advantage is a great challenge for SMEs (Prior, 2007) because of competition as many companies offer similar products or services and operate in the same market and location. Therefore, external environmental information is critical to the survival and growth of firms (Yap & Rashid, 2011). According to Akhtar, Raees and Salaria (2011), globalisation has made it easy for enterprises to import and export leading to increased competition. Yap and Rashid (2011) conclude that intelligence helps in decision making and offer a competitive advantage to an enterprise. A study of 85

firms by Subramaniam and Ishak (1998) to measure the benefits of intelligence revealed that firms having advanced systems to monitor their competitors' activities exhibited greater profitability than those that did not have such systems. The contribution of SCI to firm's performance is also evident where it has been reported that most corporate successes result from well-designed products and services, hard-won marketing campaigns, and the strategic use of intelligence, while most failures come from a combination of bad timing, poor judgment, and misuse, or insufficient use of SCI (Fuld, 1995; Wright et al, 2009; Nasri, 2010; Johns & Van Doren, 2010).

The SCI is a source of competitive advantage because it utilises both competitive intelligence and supply chain management views. According to resource-based perspective, the SCI has rent generating capabilities due to its unique disciplinary expertise and skills developed over time by its personnel about the environment, supply chain network and competitors which is difficult to be imitated or replicated by other firms (Barney, 1986, 1991; Prahalad & Hamel, 1990; Hughes, 2005). Information is factual raw data (numbers and statistics), while intelligence is a collection of information pieces which have been filtered, distilled, and analysed and turned into something that can be acted upon (Kahaner, 1997). In other words, a particular set of routines by the SCI personnel can lose its value if it can be easily replicated or imitated by competitors (Teece, Pisano & Shuen, 2000). The SCI involves a unique and systematic processing of data, thus, the probability of effectively replicating these routines in a short time is highly unlikely. Meanwhile, a supply chain itself contains multiple link activities and processes, where the uniqueness is resistant to competitive pressures and difficult to be imitated by others (Porter, 1995), unlike an isolated activity and process of a single organisation which can be easily duplicated by competitors. As such, the concept of SCI is an important source of competitive advantage for the firm.

SCI and performance of SMEs

Undeniably, the primary aim in commissioning SCI is to help achieve a profit or competitive advantage for the firm (Hart & Banbury, 1994; McGonagle & Vella, 1996; Subramaniam & Ishak, 1998; Price Waterhouse Coopers, 2002). A study on SCI activities among companies in Singapore also shows a positive relationship between use of SCI and higher organisational effectiveness (Wee & Leow, 1994). Subramaniam and Ishak's empirical study revealed that firms having advanced SCI system to monitor their environments exhibited greater profitability than firms that did not have such systems.

A survey conducted by Price Waterhouse Cooper in 2002 (Global Intelligence Alliance, 2005), reported that companies incorporating intelligence as 'critical knowledge' into their strategic thinking have a 20% faster growth rate than those that do not. Thus, SCI develops tacit knowledge of sustainable competitive advantage which is

often difficult to replicate by other firms to achieve outstanding performance (Du Toit, 2003; Hughes, 2005). However, Kahaner (1997) states that SCI activity does not have to be directly linked to business performance indicators because it is extremely difficult to measure and identify the specific intelligence that proved to be beneficial. Although SCI has many advantages, often the benefits are only identified several years later (GIA, 2004).

METHODOLOGY

Small and Medium Enterprise Corporation (SME Corp.) Malaysia is a central coordinating agency under the Ministry of International Trade and Industry Malaysia (MITI) established to develop capable and resilient Malaysian SMEs to be competitive in the global market. The microenterprise and SME classification criterion used by SME Corp. (2015) is applied in order to classify firms according to their size, whereby microenterprises are deemed to be those that have less than 5 employees while SMEs have between 5 and 200 employees. In terms of sector, firms are categorised according to manufacturing activities, services or others.

A quantitative research method is used to collect detailed information in accordance with the requirements of the study. The respondents were representatives of SMEs from various states of Malaysia who attended a few sessions of a full day seminar conducted by Majlis Amanah Rakyat (MARA), a government agency to aid small businesses. This seminar is a partial requirement by MARA for SMEs looking for opportunity to obtain government financing to expand their business. A total of 850 respondents agreed to participate. Questionnaires were distributed with brief explanations during the session, and collected at the end of the seminar.

Background information about company profile such as business sectors, size, and years of business operated were obtained from the participants. In the first section on SCI practices among SMEs; respondents were asked to identify the department or unit responsible for intelligence gathering activities, whether it is carried out by the following departments: sales & marketing, research & development, strategic planning, product development or others. For questions on formal unit of SCI, the aim is to ascertain whether the activities carried out are supported by top management and whether the right culture exists in the company as seen in frequency of the gathering, and whether the enterprise has established a formal unit and staff specialising in intelligence-based activities. A four-point scale labelled as disagree, somewhat disagree, somewhat agree and agree is used. The respondents have to indicate their sources of intelligence based on 8 listed given sources. The second section is about SCI as a tool of competitive advantage. It attempts to examine the type of intelligence most often used by the enterprise in decision making, the type of methods used to analyse information and disseminate information. The last section tries to ascertain the contribution of

intelligence-based activities carried out to improve the company's performance based on four-point scale labelled as 1 (disagree) to 4 (agree). The survey instrument is adopted and modified from past studies on SCI practices (Calof, 2003; Peyrot et al., 2002; Calof and Miller, 1997), competitive advantage (Nenzhelele, 2014) and performance (Tan et al., 1999; APQC, 2003). Some of the questions are based on rating scale format, while some open questions are included to obtain further insight into the topic.

Since several questions are on a rating scale format (Likert-scale), and some are open- ended questions (so as to obtain further insights of the topic), descriptive analyses such as frequency, mean, and standard deviation are used.

FINDINGS

SMEs Profile

A total of 813 SME owners and managers from various industrial sectors or subsectors took part in the survey, (a response rate of 96%). Based on classification of sectors by SME Corp (2015), 65% are from services, 11% from manufacturing and the remaining 24% from other sectors. In terms of firm size (measured by total number of employees according to SME Corp classification of sectors), about 40% are considered small, 40% are micros, and only 20% of participating companies are medium-sized enterprises. Majority of companies (53%) have been established for 6 or more years, 22% has been operating for 3 to 5 years, 18% for 1 to 2 years, and the remaining 7% less than a year.

SCI practices in SMEs

The first objective is to examine how SMEs perform and manage their SCI activities whereby the latter are analysed by identifying the unit responsible for intelligence gathering, whether it is a formal unit, the frequency of collection, sources of SCI data, the existence of positive intelligence culture and top management support. The variables were sorted according to their mean values.

Table 1 records information on the units involved in SCI gathering. They are measured by a four-point scale from 1 to 4 on the levels of importance. The item with the highest mean implies that intelligence activities in the firms are everyone's responsibility forming part of the job function of employee to share knowledge on intelligence. However, the existence of a formal unit actually refers to a department appointed to do SCI gathering and that there are full time staff in-charge of intelligence activities. The results clearly imply that intelligence activities in most SMEs are carried out by the employees.

Table 1
Formal unit of SCI

Formal unit of SCI	Mean	Std. Deviation
Intelligence is integrated throughout the firm	2.9592	0.7035
Formal unit of intelligence activities	2.9346	0.6983
Full time staff for intelligence activities	2.7645	0.6791
Part time staff for intelligence activities	2.6964	0.6915

Table 2
Department/unit responsible for intelligence gathering

Unit responsible for intelligence gathering	Frequency (N=813)	Percent (100%)
Sales & Marketing	433	54.9
Research & Development	136	16.7
Strategic Planning	127	15.6
Product Development	82	10.1
Other	22	2.7

In Table 2, majority of the respondents (54.9%) agreed that SCI gathering activities are usually under the sales and marketing department/unit. Less than 20% assign them to the research & development, strategic planning, and product development departments.

In measuring whether the respondents' firm's culture supported SCI practices, the average of the mean and standard deviation for this question are 3.138 and 0.719 respectively. The standard deviation indicates that there is less spread of responses to this question. Since most of the respondents concurred with the mean, this indicates that most of the SMEs have a supportive culture for SCI practice (refer Table 3). Similarly, highest value of mean between 2.970 to 3.0136 in Table 4 shows that the majority of respondents' key decision maker support SCI practices.

Table 3
Intelligence culture

Intelligence culture	Mean	Std. Deviation
i. Encourages sharing of information and knowledge between employees	3.1646	0.7427
ii. Recognises intelligence for competitiveness strategy and decision making	3.1529	0.6842
iii. Emphasises legal and ethical practices on intelligence activities	3.1498	0.7223
iv. Recognises intelligence as a necessary activity to all employees	3.0841	0.7265

Table 4
Top management support

Top management support	Mean	Std. Deviation
i. Top management provide convenient ways for employees to report intelligence	3.0136	0.7449
ii. Top management requires intelligence outcome in strategic decision making	3.1097	0.6752
iii. Top management allocate budget for intelligence gathering activities	2.9704	0.7867

Results in Table 5 show that most SCI gathering activities are performed on ad-hoc basis. This implies that most SMEs collect the SCI only when needed.

Table 5
The frequency of SCI activities

Frequency of SCI activities	Mean	Std. Deviation
Intelligence gathering activities are performed on ad-hoc basis only when needed.	3.0667	0.7966
Intelligence gathering are continuous and regular activities in our firm	2.8728	0.7275
Intelligence gathering activities are performed separately by each department	2.8259	0.6674

In addition, the three main sources of SCI received by SMEs are mainly from their employee (76%), followed by intelligence gathered from visits to trade fairs & from competitions (71%), and own customers (68%). In addition, Internet search engines, news in the press and magazines related to the sector, and own suppliers are other sources used regularly. But sources such as from company websites and data bases of patents are the least used. This is shown clearly in Table 6.

Table 6
Frequency of sources used in SCI

Main Sources used	Frequency (N=810)	Percent
Our employee/ department	617	75.9
Visits to trade fairs and competitions	579	71.2
Our customers	554	68.1
Internet search engines	524	64.5
News in the press and magazines attached to the sector	514	63.2
Our suppliers	474	58.3
Company websites/ news groups/ bulletins	181	22.3
Data bases of patents	51	6.3

Contributions to Competitive Advantage

The second objective is to analyse the extent of SCI contributions on SMEs's competitive advantage. Thus, this usage of SCI in decision making, the frequency of analytical methods and how the results are disseminated are discussed in this section.

Table 7 shows that SCI on customers is used frequently (59% of the time) in any decision making followed by competitors (58%). Meanwhile, SCI on internal operations (33%), suppliers (22%), technology (16%), similar industries,

Table 7
Frequency of SCI usage in decision making

	Frequency	Percent
Customers	475	59.1
Competitors	463	57.7
Internal operations	260	32.8
Suppliers	174	21.8
Technology	128	16
Similar Industries	85	10.7
All levels of government & regulatory institutes	81	10.2
Macro Trends	62	7.8

government & regulatory institutes and macro trends showed lower frequency of usage for decision making.

In terms of frequency of usage of analytical tools, Table 8 shows that the tools with over 60% usage are PEST analysis (82%), use of statistical programmes (73%), benchmarking surveys (70%), valuation techniques (68%), SWOT analysis (66%) and financial ratio analysis (61%). The least used techniques (less than 30%) were value chain and macro environment analysis.

Table 8
Frequency of analytical tools or methods

	Frequency	Percent
PEST analysis	668	82.2
Statistical programs	597	73.4
Benchmarking survey	565	69.5
Valuation technique	552	67.9
SWOT analysis	536	65.9
Financial ratio	493	60.6
Value chain analysis	179	22
Macro-environment analysis	61	7.5

Efficiency in disseminating SCI results is important to ensure its effectiveness in reaching the right people at the right time. Table 9 shows that written reports are the most popular dissemination methods used (51%), followed by meetings (42%). Meanwhile, presentations, email, central database, industry audit and intranet have been used regularly for dissemination purposes but at less than 30% of the time.

Table 9
Frequency of dissemination methods of SCI

	Frequency	Percent
Written reports	417	51.3
Meetings	344	42.3
Presentations	236	29
Email	229	28.2
Central database	171	21
Industry audits	170	20.9
Intranet	152	18.7
Seminar/Conference	111	13.7
Newsletters	102	12.5

SCI contributions to SMEs performance

In ranking importance of SCI contributions to SME performance, the results in Table 10 show that increase in customer satisfaction has the highest mean score (M=3.498, SD=0.5608), followed by improved pricing strategies (M=3.423, SD=0.573), improved development of new products/ processes (M=3.378, SD=0.567), and improved threat and opportunity identification (M=3.369, SD=0.545). With the average standard deviation of 0.587, there is less spread of the responses to this question. This means that most of the respondents agreed with the average mean of 3.33. Therefore, majority of the respondents agreed that SCI plays an important role in SME performance.

Table 10
Descriptive Statistics of SCI contributions to SMEs performance

	Mean	Std. Deviation
Increased customer satisfaction	3.4982	.5608
Improved pricing strategies	3.4215	.5730
Improved development of new products/ processes	3.3776	.5670
Improved threat and opportunity identification	3.3691	.5454
Achieved cost savings/ lean	3.3000	.6091
Achieved time savings	3.3009	.6132
Improved responsiveness in changing market	3.2848	.5808
Strengthen supply chain performance	3.2840	.6316
Improved technological effectiveness	3.2771	.6028
Accelerated decision making	3.2330	.5719

DISCUSSION

In terms of SCI practices, the results show that most SMEs place high priority on SCI activities to be carried out by their employees. Gilad (2011) stressed that executives should think of strategic intelligence as a job function of everyone in the organisation to instil the importance of intelligence in an organisation. Thus, SCI should be integrated and it is the responsibility of all employees to look for early signs of risks and opportunities from the external environment. It is further noted in the study by Zha & Chen (2009) that reported on the importance of intelligence as a mechanism SMEs can adopt to compete globally. Findings show that SCI activities functioned mostly in the sales and marketing department. Safarnia, Akbari and Abbasi (2011) suggest that intelligence gathering has its origins in the field of marketing field and therefore, it is still seen as a job of the marketing department. Adidam, Shukla and Banerjee (2008) examined the intelligence practices of 145 Indian firms of various sizes, industry categories, and ownership structures through a survey method whereby questionnaires were sent via mail. They found that the majority of SCI functions were located in the corporate planning or marketing research department. Thus, we can see that most SCI information is still generated by, housed and utilised by the sales and marketing department. In terms of intelligence culture, the findings show that smaller size SMEs make it convenient for employees to report and share intelligence information among them. It is also easy to reinforce a positive culture in the vision and perception held by employees toward SCI effectiveness (Wee & Leow, 1994; Saayman et al., 2008). Support from senior management is also important in providing legitimacy and highlighting the importance of the strategic use of SCI; this can be achieved via establishing proper channels between employee and management in contributing important and unique field data (Research and Markets, 2008). Most SMEs are disadvantaged by size while most SCI

activities are performed on ad-hoc basis due to shortage of manpower or high work overloads. Most of the sources of SCI are employees and it would be safe to say that 60% of the information needed is already found in the company. However, SMEs can still experience the advantage of a large firm by using informal intelligent networks such as visits to trade fairs and exhibition (Subramanian & Ishak, 1998; Groom & David, 2001; Yap & Rashid, 2011). Establishing close contact with customers about competing products and maintaining good relationship with suppliers to probe on competitor orders should be carried out continuously. Additionally, internet provides a relatively simple medium for advertising but it also provides the opportunity to investigate a competitor's offering.

The SCI is a tool to develop a firm's sustainable competitive advantage and improve performance.It is used by a majority of the organisations in strategy formulation (McGonagle & Vella, 2004; Wright & Calof, 2006; Yap & Rashid, 2011) by focusing on the needs of customers, tracking competitors' moves, and obtain data on internal operations of their rivals. All of these provide sufficient data in intelligence activities. The findings also show that analytical tools such as PEST and statistical analysis are the most used by SMEs for strategic decision making. Most intelligence activities in SMEs provide written reports, meetings, and presentations as efficient disseminating methods to the right people and at the right time. Yap and Rashid (2011) conclude that intelligence helps in decision making and offers a competitive advantage to an enterprise. They emphasise that the majority of business enterprises have some sort of intelligence activities in place, whether formally or not. Chang, Wu and Cho (2011) found that intelligence practice provides SMEs with competitive advantages such as management flexibility, strong reactive ability, resilience and vitality to compete with both local and international enterprises.

Finally, a number of studies confirm a statistical link between SCI activities and business performance (GIA, 2004; Hughes, 2005, Wilkins, 2007). For example, an analysis by Price Waterhouse Coopers (2002) found that companies incorporating SCI into their strategy formulation reported better growth rates. The findings of this study reaffirm past studies by Tan (2002) and Wilkins (2007) who confirmed that customers, suppliers, and service providers in the supply chain can be a valuable source to improve business and supply chain performance. It can be concluded that the intelligence system in industrial microenterprises and SMEs in Malaysia is still at an initial, developing phase and this finding coincides with studies carried out by some institutions and authors (Yap & Rashid, 2011).

CONCLUSION

SMEs have become increasingly aware of the necessity to remain informed of their competitive environment (Pelsmacker, Muller, Viviers, Saayman, Cuyvers and Jegers, 2005). Calof and Wright (2008)

confirmed that the intelligence gathered are able to support decisions in many areas of corporate or business strategy, sales or business development, market entry decisions, product development, R&D/ technology decisions, M&A decisions, joint venture decisions and regulatory/ legal responses. Without proper planning in terms intelligence, businesses will find it almost impossible to compete in the global economy. Gilad (2011) reported that a majority of Fortune 500 companies fails to realise the full benefits of intelligence by not using it often enough or using it the wrong way. Effective SCI not only facilitates risk management by predicting, identifying, avoiding, transferring, spreading and controlling risks, but also helps SMEs to enhance the capabilities of risk awareness and risk prevention.

It is hoped that the findings of this study will benefit SME practitioners and academicians who are deliberating on the need and importance of SCI in gaining competitive advantage and effective strategic decisions. Since small business growth and viability is an integral part of overall economic health in Malaysia and abroad, it is hoped that the findings of this study could ultimately improve SMEs competitiveness and business performance as well as boost local, state, and national economies. In addition, this study has provided a platform for businesses and government to establish and streamline systematically a SCI database of the various industries for easy accessibility to those in need (both public and private). This will enable them to gain clearer understanding of the industry and how they can utilise them effectively for the benefit of the country.

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