

# Critical Success Factors of Sustainable Competitive Advantage: A Study in Malaysian Manufacturing Industries

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## Abstract

To develop a theory relating to SCA, one needs to define the measurement criteria for SCA. In recent times, although there were many researches that were undertaken focusing in the area of Sustainable Competitive Advantage (SCA), there is still, however, a lack of an operational definition for SCA. There is no one agreed upon method for evaluating sustainable competitive advantage for business organizations and hence the measurement criteria for SCA have not been established despite the extensive focus in the area. In the past, performance indicators such as profitability or market share have always been used to justify the determinants of the SCA. Should both the factors play a leading role in determining the SCA, what about other auxiliary or peripheral factors that could be a contributing point? There should be a quantitative numerical value that depicts the sustainability of a manufacturing organization. The key objectives of this study are to examine the definition and the various viewpoints on Sustainable Competitive Advantage and subsequently to develop a measurement criterion that represents Sustainable Competitive Advantage. Given such kind of scenario, the initial step would be to develop or create an operational definition for SCA. This paper hence is an attempt to explore the various viewpoints on literatures on Sustainable Competitive Advantage and to develop dimensions that represents Sustainable Competitive Advantage. We conceptualized a framework to evaluate the influence of four variables namely; Effective Supply Chain Management (2) Product differentiation and Innovation, (3) Organizational responsiveness; and (4) Cost Leadership. The study is based on empirical data collected from a survey of managers of Malaysian manufacturing industries. The data were collected through an email survey, and had 300 valid responses. The analysis shows that all the four hypotheses were supported. The findings of this study would assist in defining a more precise way of achieving a sustainable competitive advantage in Malaysian manufacturing industries.

**Keywords:** sustainable competitive advantage, resource-based view, strategy, theoretical model

## 1. Introduction

With the progression of organizations into hypercompetitive markets, the continuous need to innovate and communicate becomes harder and thus there is a need to adopt specialized generic strategies to reach out to customers differently and to gain competitive advantage (Drobis, 1991). No advantage is sustainable on a prolonged basis as the competing organizations will eventually imitate the product. Even when the attempt to imitation does not take place, the rapid change in the technological evolution tends to shorten the lifespan of the technological resources and technological know-how. Thus to create a sustainable competitive advantage, there should be a sustenance in holdings in the incumbent organizations.

Literatures on competition and competitive advantage during the earlier times have sparked off many interests on Sustainable Competitive Advantage (SCA) in recent times. The prominent role of competitive advantage may have been derived from the economic and militaristic origins of the strategy literature (Fahy, 2000; Whittington, 1993). In the field of strategy, (Bain, 1956; Kay, 1994; Porter, 1980) sustainable competitive advantage has always been a dominant feature for many years. The focus of sustainable competitive advantage thrust into limelight in the 80's when Day (1984) explored the strategies that probably help to "sustain the competitive advantage. The birth of 'SCA' soared into prominence when Michael Porter presented the types of competitive strategies an organization can possess – low cost, differentiation and focus, in order to achieve SCA. Coyne (1986), attempted to define SCA by saying that in order to possess an SCA, consumers must perceive some

difference between a firm's product offering and the competitors' offering. This difference must be due to some resource capability that the firm own which the competitors do not possess, and this difference must be some product or delivery attribute that is a positive key buying criterion for the market. It was not Porter or Coyne, however who furnished a conceptual definition of SCA. Barney (1991, p.102) offered a two faceted definition. He says that "A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy." When other firms are unable to duplicate the benefits of this strategy, then the competitive is sustained (Bharadwaj, et al., 1993).

The fundamental way of creation of SCA, is thus, the ability to predict the forthcoming action of others in the industry via matching the organization's resources to the gaps and voids that exist the industry. The sustainability of the advantage is then determined on whether the competitor will or will not be able to take the necessary actions to close the gap (Coyne, 1986).

### *1.1 Objective of the Study*

The objectives of this study are:

- 1) To empirically explore the various viewpoints on literatures on Sustainable Competitive Advantage; and
- 2) To develop the appropriate measurable dimensions that represents Sustainable Competitive Advantage

## **2. Literature Review**

### *2.1 Viewpoints of Sustainable Competitive Advantage*

Terms such as "sustained advantage" (Barney, 1991) and "sustainable advantage" (Grant, 1991) expounded in literatures can be interpreted in the same way (Fahy, 2000). Sustainability does not refer to a particular period of calendar time, nor does it imply that advantages persist indefinitely (Gunther et al., 1995) but rather depends on the possibility and extent of competitive duplication. Fahy (2000) states "It starts with the assumption that the desired outcome of managerial effort within the firm is a sustainable competitive advantage". In some studies, conventional terms such as market-share and profitability (Bharadwaj et al., 1993) have also been used as the barometer of measurement of superior performance that leads to an SCA. In their proposed conceptual model, Bharadwaj et al. (1993) made an attempt to integrate SCA factors from the various fields such as strategic management, marketing and industrial organization economics in order to explore the implications of the distinctive characteristics of firms for achieving SCA (Fahy, 2000). They noted that it is the internal resources of firm which is not made available to competitor that has greater potential to generate superior competitor advantage as oppose to the environmental factor which is very much readily available to all other competitors. Besides capabilities such as team-embodied knowledge, organizational culture and history, Bharadwaj et al. (1993) also included "the set of formal rules and structures that governs the way people relate and the firm's culture and history as a paramount point for the success of an organization. This view is also shared by (Barney, 1986; Dennison, 1984; Kotter and Heskett, 1992) which states that the firms with strong values, shared beliefs and visions will outperform firms that are weak in these areas.

According to Grant (1995) the sustainability of the competitive advantage is considered to be along the dimensions of durability, mobility and replicability. Durability is a measure of the ability and the resilience of the organization to ward of imitation from competitors. Mobility, on the other hand, refers to the extent to which resources can be transferred between competitors together with the replicability which describes the ease with which resources can be copied by competitors (Chaharbaghi and Lynch, 1999).

Based on all the viewpoints, sustainability, in essence, consist of various subsets which are internal as well as external to an organization and (Chaharbaghi and Lynch, 1999 is best considered as a dynamic process rather than a static concept that is locked in time. SCA can be termed as a prolonged sustenance of a value-creating and value-providing strategy which is non imitable or not concurrently being implemented by any current rival organization.

### *2.2 Sources of SCA - The Four Perspectives*

As sustainable competitive advantage comes into being through the dynamic interplay between a firm and its external environment (Lewis, 2000), sustainability thus, is more accessible in industries with more than one dominant strategy because competitors may not have the same options as the incumbent organization (Montgomery and Porter 2009). Though, there have been much developments and advancements in the theories revolving around the whole competitive advantage concept, the ideas and work of Michael Porter, that strategies can be classified into generic categories namely, cost leadership, differentiation, focus or a combination has been

the most influential over the years compared with any other writers in considering organizational strategies. According to Porter these generic strategies if used efficiently are capable of attaining above average industry results among the competitors. The theories developed thereafter, though different, but do take Porter's theory, as a base and could be termed more as the result of the evolving cycle of the Porter's strategy. Supportively, Bowman and Johnson (1992) state that it is very unusual to find managers in today's time who talk about strategy and do not include cost leadership, differentiation and focus in their discussion.

Historically, attempts to address the possibility of attaining a sustainable competitive advantage has been viewed from four major aspects (Ma, 2003). They are: the structural approach based on industrial organization (IO) economics (Porter, 1980, 1985); the resource based view (RBV) of the firm (Barney, 1991, 2001); traditional IO economics and game theory (Caves, 1984; Ghemawat, 1991), and Schumpeterian economics (Schumpeter, 1934, 1950; Foster and Kaplan, 2001). Two recent additions are the Dynamic Capability View and the Blue Ocean Strategy.

In their effort to define and to specify the fundamental methods of competitive advantage, all of the views tend to limit an organization in understanding the nature of the full dynamism of the strategy. The resource-based view primarily focuses on the development of the competitiveness for the future whilst other view's central concern emphasizes on the present deployment of resources which was previously developed. The primary purpose of an organization's existence is not only to exist but also to thrive. Sustainability, therefore, can only be obtained while juxtaposing both – the present and the future. While continuously exploring the competitive advantage for the future, organizations will also be in the need of exploiting the existing opportunities. (Chaharbaghi and Lynch, 1999) termed the existing resources as being largely static and unchanging and while the dynamic environments ceaselessly call for a new generation of resources as the context constantly shifts. A mere focus on competition by scholars and organizations is claimed to be ignoring two very important aspects of strategy (Kim and Mauborgne, 2004). Firstly, to find and develop the markets where there is no or very little competition (blue ocean strategy) and to continuously exploit and protect the blue oceans.

### *2.3 Operationalization of Sustainable Competitive Advantage*

The traditional Industrial Organization economics is omitted in this study because the structural approach is rooted very much in the IO economics; hence the Structural Approach was picked. The Schumpeterian economics was also dropped as they believe that sustainable competitive advantage is often impossible to achieve due to the presence of 'creative destruction' (Ma, 2003). They, instead propose the creation of new games instead of fighting strongly against the incumbent player which impedes the attainment of sustainable competitive advantage. This view is also similar to the latest 'Blue Ocean' strategy which advocates differentiation as their main strategy. Hence Blue Ocean strategy is included. The Dynamic Capability View was added because it proposes adaptability and modification of resources to sustain a competitive advantage. Hence, for this study, to operationalize Sustainable Competitive Advantage, the following approaches were examined.

#### *2.3.1 The Structural Approach*

The structural approach (Porter, 1980; Caves and Ghemawat, 1992) examines and emphasizes on the role of entry and mobility barriers that are erected to safeguard an organization from the competitive forces and threats from current rivalries, substitutes and potential new entrants. Porter (1980) developed an industry analysis framework (five forces) which argues that, holding industry structure constant, positioning in an industry plays an important role in determining the organization's competitive advantage and profitability (Ma, 2003). Sustainable advantage is, therefore, achieved by defending and positioning themselves in an attractive position; while continuously ward themselves off from the current rivalries and potential rivals by erecting and manipulating the entry and mobility barriers (Porter, 1985).

#### *2.3.2 The Resource-based View*

According to Barney (1991, p.102), "a firm is said to have a competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitors". He proposed a framework using four primary attributes – value, rareness, inimitability and non-substitutability. Subsequently, Peteraf (1993) highlighted four conditions that are necessary to achieve an SCA. They are resource heterogeneity, resource immobility, ex-ante and ex-post limits to competition. His model was applicable for single business strategy and diversification.

#### *2.3.3 Dynamic- Capability View*

Dynamic Capability View focuses on the development of resources with rent-generation potential rather than the

possession. Dynamic Capability View (Teece, Pisano et al., 1997); Eisenhardt et al 2000; Zollo and Winter 2002) emulates the views of the Schumpeterian theory (Schumpeter, 1934) and the evolutionary economics (Nelson and Winter, 1982). Schumpeterian perspective emphasizes on innovation and creation new games (Christensen, 2000; Foster and Kaplan, 2001), instead of fighting against strong incumbent players who has the privilege being the setter of the industry standard and the rules of the game. Organizations with dynamic capability will constantly increase or maintain the value of the current resources or the position of the market via a flexible adaptation method in countering a dynamic competitive environment are said to be able to capture Schumpeterian “flexibility” rents (Makadok, 2004).

#### 2.3.4 The Blue Ocean Strategy

Blue Ocean denotes the unknown market space, untainted by competition. The key point in Blue Ocean is making the right strategic moves. Competitions are never used as benchmarking factors instead the incumbents often create blue ocean, mostly with their current core businesses (Kim and Mauborgne, 2004). It’s also not about technology innovation, either. It is about building brands. It rejects the trade-off between low cost and differentiation because blue ocean creators attract customers in larges scales and volumes thus they would be able to generate economies of scale very rapidly, placing the potential imitators and current rivalries at a cost disadvantage.

#### 2.4 Summary of Operationalization of Sustainable Competitive Advantage

All the above four viewpoints and studies in this area very succinctly demonstrate that clear identification, appropriate development and diligent deployment of both the intangible and intangible assets coupled with management capabilities will enable organizations not just survival but to also to emerge as market leader. The Porterian viewpoint says that an organization is said to have a competitive advantage when it is implementing a value creating strategy which is not simultaneously implemented by any current or potential competitor (Porter, 1985), either because the potential competitors are unable to duplicate it is too costly to imitate. The resource-based view, states that in order to maintain sustainability, an organizations’ resource will have to be valuable in exploiting opportunities and/or neutralizing threats, it must be rare, imperfectly imitable and there should not be substitutes for this resource (Barney, 1991). The Dynamic capability view says that sustainability can be obtained if an organization focuses on the development of resources with rent-generation potential rather than on the current possession hence, an organization must be able to modify, integrate and utilize the resource base to fit the environment (Helfat and Peteraf, 2003; Eisenhardt and Martin, 2000; Teece et al., 1997). The Blue Ocean strategy gives predominant emphasis on value innovation, i.e. simultaneous pursuit of a low-cost and differentiation strategy. It involves focusing on non-customers via innovation rather than competing on a same strength.

According to Montgomery and Porter (2009), the only way to sustain a competitive advantage is to upgrade it. That is, to move to more sophisticated types. With that saying and building on all the above four views, the measure for Sustainable Competitive can be devised with four major dimensions. They are (1) Effective Supply Chain Management (2) Product differentiation and Innovation, (3) Organizational responsiveness; and (4) Cost Leadership. Figure 1 depicts the information on how SCA was operationalized.

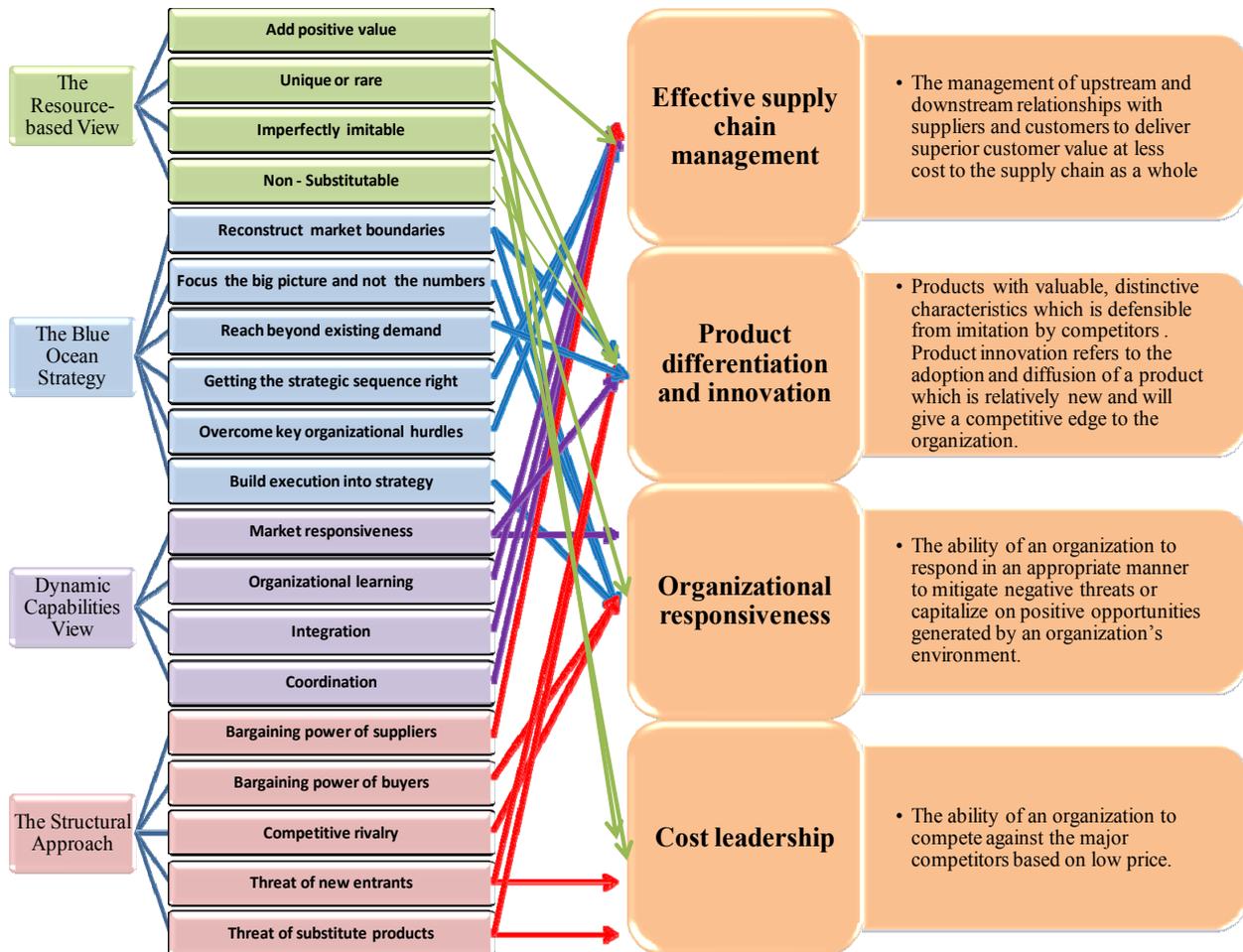


Figure 1. Operationalization of SCA

#### 2.4.1 Effective Supply Chain Management

Supply chain management (SCM) has been considered as the most popular operations strategy for improving organizational competitiveness in the twenty-first century (Gunasekaran et al, 2006). Christopher (1998) defined Supply Chain Management as “the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole”. SCM is used to describe the management flow of materials, information, and funds across the entire supply chain, from suppliers, component producers to final assemblers, distribution (warehouses and retailers), and ultimately to the consumer” (Govindan et al., 2010). With great emphasis on customer-led production, SCM creates value on products based on time, form, possession and place (Ballou, 2004). It is a network of facilities and distribution options that performs the functions of procurement of materials, and transforming the materials finished products, and the distribution of these finished products to end customers (Ganeshan and Harrison, 1999). Hence, the building blocks of SCM are activities such as materials requirement planning, demand forecasting, loading, procurement, material handling, storage and warehousing, the conversion processes and transportation and shipping. The performance of supply chain management thus is enhanced by linking the internal processes of an organization with the external relationship with the suppliers. It is therefore; involves coordination, collaboration and integration between the organization with the suppliers as well as the customers.

#### 2.4.2 Organizational Responsiveness

As manufacturing organizations moves into the twenty-first century, there are transformational changes that is reshaping the business landscape of manufacturing organizations in the world. The marketplace has evolved to be a global competition arena. A new paradigm based on the deeper exploration of investigation of the value chain is emerging (Buzacott, 1995). Responsiveness therefore, should be considered as a concept that is solely focusing on changing customers' needs and its measurability depends on where the system boundaries are drawn

and thereby on the definition of the system's customers (Reichhart and Holweg, 2007). Organizational responsiveness refers the ability of an organization to respond to its external environment in an appropriate manner (Clippinger, 1999). A more radical definition would be that responsiveness is the aggressiveness of an organization's marketplace strategy (Gresov, Haveman, and Oliva, 1993). Konsynski et al., 2007, added that organizational responsiveness also refers to the inter-individual knowledge exchanges which, in turn influence the ability of the organization to respond to a changing environment in a particular style.

#### 2.4.3 Product Differentiation and Innovation

It is difficult to define differentiation (Jernström 2000). Often times, organizations products that are modified, upgraded and niche products are described as differentiation products. This is based on acquiring competitive edge by channelizing its product or service in a different way such that they are able to set apart their offering in comparison to their competitors and the organization is able to tailor the products or service in a way such that the consumers need is fulfilled. Porter (1985) says an organization differentiates itself from its competitors if it can be unique at something that is valuable to the buyer and the differentiation can result from anywhere in the value chain. The source of competitive advantage lies in the ability of an organization to differentiate its products or services is either wholly or partly, via the skills of the employees, the capabilities of the processes and technologies, and the standard manufacturing procedures set the management (Hayes and Wheelwright, 1984; Kotha and Orne, 1989).

For this study the definition by Calori and Ardisson (1988) is assumed, which says that the offer given to the customer will have to have some valuable distinctive characteristics and those characteristics (1) must be perceived by the customers, (2) defensible from imitation by competitors and (3) valuable for the supplier either via higher market share and/or higher margin.

Organizational innovation broadly refers to adoption and diffusion of an internally generated or purchased device, system, policy, program, process, product, or service which is relatively new to the adopting organization (Damanpour, 1991). According to (Chen et al., 2004) innovation refers to the introduction of a new combination of the essential factors of production into the production system. Innovation has been defined as the "generation, acceptance and implementation of new ideas, processes, products or services (Thompson, 1965, p. 36). Innovation and innovativeness has been examined as creativity by Andrews and Smith (1996). They have defined marketing program creativity "as the extent to which the actions taken to market a product (eg, package changes) represent a meaningful difference from marketing practices in the product category" (p. 175). Innovation can broadly be described as the implementation of discoveries and interventions and the process by which new outcomes, whether products, systems or processes, come into being (Gloet and Terziovski, 2004), especially its processes and information system (Cole, 1998; Harvard Business Review, 1998; Myers, 1996) and, as such, it is determined by the willingness of the members of the organizations to consider the adoption of innovation activities as an essential tool to meet the customer's expectations (Hurley and Hult, 1998, p. 44). For this study, innovation in sampled organization is measured via the implication that an organization being proactive by exploring new opportunities rather than merely exploiting current strengths" (Menguc and Auh, 2006, p. 65).

#### 2.4.4 Cost Leadership

Cost Leadership is defined as "The ability of an organization to compete against major competitors based on low price" (Li et al., 2006, p. 120). An organization should be able to remove or change all its activities which do not provide it with a cost advantage, rather they must find ways to reduce cost or even look for ways like mass production, input cost, economies of scale, raw materials access, input cost, technology, utilization of resources, product design and even can look to outsource its activities to other organizations that could then help it achieve cost advantage (Akan et al., 2006).

Porter (1980) defined cost leadership as the achievement of "overall cost leadership in an industry through a set of functional policies aimed at this basic objective. It requires an aggressive setting up of efficient-scale facilities, vigorous pursuit of cost reductions from experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas like Research and Development, service, sales force, advertising, and so on," (p. 35). Porter (1980) outlined 10 top cost drivers which are attributed low-cost strategies, all of which has direct and indirect linkage to management and resources of manufacturing facility.

By cost leadership, it is worth noting that Porter's focus is not on various pricing tactics, instead the focus is on suitable overarching strategic planning and the pertinence of attaining lower costs than competitors, regardless of pricing method applied. How would then, cost leadership achieved? It is mainly obtained via focusing on efficiency (Green et al., 1993). This efficiency can be obtained through various economies in the manufacturing

or distribution process (e.g. economies of scale, scope, marketing, etc.) (Wright, 1984).

### 3. Conceptual Framework

#### 3.1 Conceptual framework

The proposed conceptual model directing this research is illustrated in Figure 2. As indicated in the diagram, we hypothesize sustainable competitive advantage as a multi-dimensional construct consisting of four dimensions. They are: Effective Supply Chain Management, Product differentiation and Innovation, Organizational responsiveness; and Cost Leadership as the dependants. The four dimensions act as antecedents to sustainable competitive advantage.

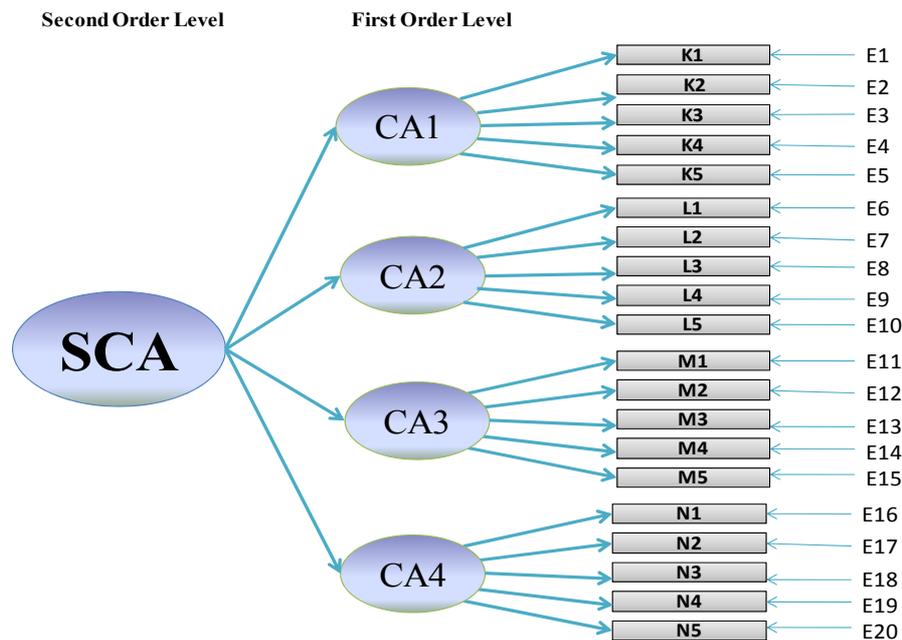


Figure 2. Components of sustainable competitive advantage

#### 3.2 Research Hypothesis

As explained, in the literature review, the research hypotheses for Sustainable Competitive Advantage for Malaysian context are framed as follows:

*H1: Effective Supply Chain Management is one of the measures of Sustainable Competitive Advantage*

*H2: Organizational Responsiveness is one of the measures of Sustainable Competitive Advantage*

*H3: Product Differentiation and Innovation is one of the measures of Sustainable Competitive Advantage*

*H4: Cost Leadership is one of the measures of Sustainable Competitive Advantage*

### 4. Research Methodology

#### 4.1 Selection of Sample

A large sample cross-sectional email survey was carried out with manufacturing organizations. The findings are based on the 300 completed email survey responses. A total of 960 survey questionnaires were e-mailed to business organizations from the list published by FMM and SME Corp. The sampling frame also included the MITI quality management award winners and finalists. The questionnaire e-mailing yielded 339 questionnaire returns, for an overall response rate of 35%. After removing the outliers, 300 questionnaires were left, which represents a usable response rate of 31%.

#### 4.2 Instrument Development

The main objective of this paper is to develop an instrument for measuring top managers' perception Sustainable Competitive Advantage in manufacturing organizations in Malaysia. For data collection, this study uses

Mono-method Quantitative, a choice which is increasingly advocated within the business and management research (Curran and Blackburn, 2001). The measurements of the construct SCA involve a total of twenty scaled question measuring five dimensions and were measured with five-point interval scale questionnaire, in the study. Questionnaires works best with standardized questions that will be interpreted the same way by all respondents (Robson, 2002). The measures uses Likert-Style Rating Scale with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. The respondents were required to indicate their degree of agreement or disagreement with the attitude statements developed for this study to measure the construct.

To ensure content validity, an adequate judgment can be made by a thorough review of literature; prior discussion with others; or a panel assessment (Saunders et al., 2009). This research instrument was further pretested with academic staff of Multimedia University and by practicing managers to get an understandable and unambiguous language before the formal distribution of the survey instrument. Pre-testing is done to ensure that the questions are indeed eliciting the required responses, while uncovering ambiguous wordings or errors before the actual survey are carried out (Burns & Bush, 2002; Zikmund et al., 2000). The preliminary twenty items survey questionnaire was presented to three industry practitioners. All the respondents were requested to comment critically on the suitability, the appropriateness and the ease of understanding of the each item. The respondents were requested to identify any difficulties with wording, problems with double-barrelled questions, leading questions and biasness (Zikmund et al., 2000). Subsequently, all the items for each research construct were pilot tested before performing the final study.

#### *4.3 Data Analysis and Assessment of Model*

For this research, the inferential statistics used are correlations and structural equation modeling (SEM). Correlation analysis was used to examine the existence of relationships between variables that are being studied. The details are discussed below. Structural Equation Modeling (SEM) was considered to be the most suitable statistical methods for this study compared to other multiple method such as regression analysis or multivariate analysis of variance (MANOVA) (Ramanathan 1989), because SEM combines aspects of multiple regressions (examining causal relationship) and factor analysis (representing the unmeasured factors with multiple variables) to estimates a series of interrelated dependence relationship simultaneously (Hair et al, 2006). The model estimation was performed using AMOS 18.0, a software package that is user-friendly software which provides a graphical user interface that is easy to understand. AMOS also allows data to be imported directly from SPSS.

Firstly, an Exploratory Factor Analysis (EFA) and Reliability test was carried out. The correlation matrix of the variables was exercised via SPSS correlation property to test for multicollinearity. For this study, Principle Component Analysis was selected because the main objective of conducting the factor analysis is to determine how and to which extent the items are linked to their underlying factors (Zhang et al., 2000; Byrne, 2010). Principle Component Analysis method will be able to help in identifying if the selected items cluster on one or more than one factor According to Zhang et. al. (2000), this is particularly important when there are more items selected to measure a construct.

The Principal Component Extraction method with Promax Oblique Rotation was employed. Oblique rotation should be used when factors in the population are likely to be strongly correlated (Malhotra 1996) and is suitable method when some correlations were expected among variables (Hair et al., 2010). The factor loading of 0.5 was used as a lower cut-off value as per recommendation by Pallant, (2001); Hair et al, (2006). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy which features an index between 0 and 1 of the proportion of variance among the variables that might be common variance (ie., that might be indicative of underlying or latent common factors) was employed. The appropriateness of factor analysis, is determined by examining the the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy The value of 0.60 or above is required for KMO to be considered as a good factor analysis (Tabachnick and Fidell, 2001). The reliability was measured by Cronbach Alpha which should exceed a threshold of 0.70, although a 0.60 level can be used in exploratory study (Hair et al, 2010).

Secondly the adequacy of factor models was tested using the Confirmatory Factor Analysis procedure. AMOS provides are many fit indices to test for model fit. The most commonly used fit indices are, Chi-square/df ratio, goodness of fit index (GFI), adjusted goodness of fit index (AGFI), Tucker-Lewis Index (TLI), comparative fit index (CFI) and root mean square error approximation (RMSEA) (Hair et al., 2010). For chi-square/df ratio, a value less than 3 is preferred, for GFI, AGFI, TLI and CFI, the value must be at least 0.9 and the RMSEA value must be less than 0.08 (Byrne, 2010).

Thirdly, the multi-factor measurement model adequacy was tested. Cross loadings and correlation between the subscales were inspected. According to Hair et al. (2010), a correlation value of more than 0.85, indicates the

presence multicollinearity between the two constructs. In such situation, one of the two constructs must be dropped from the model.

## 5. Results

Items K1 to K5 measuring - Effective Supply Chain Management; L1 to L5 measuring - Organizational Responsiveness; M1 to M5 measuring - Product Differentiation and Innovation; and N1 to N5 measuring - Cost Leadership. Each item was measured on a Likert scale of 1 to 5, where 1 indicated strong disagreement, while 5 indicated strong agreement to the statement.

### 5.1 Exploratory Factor Analysis

Table 1 provides the summary, from the construct, Sustainable Competitive Advantage, after applying EFA. At this stage, three observed variables, K3 and L4 and J4 were deleted from analysis because of their poor loading on respective constructs. The subsequent 18 items in Sustainable Competitive Advantage were factor analyzed. The extracted results showed that all items loaded on their hypothesized factor. As recommended by Pallant (2001), factor loading of 0.5 was used as a lower cut-off value.

Table 1. Components of sustainable competitive advantage

Observed Variables	Exogenous Latent Variables	Original Observed Variables	Removed Variables	Current Observed Variables
K1 to K5	Effective Supply Chain Management	5	K3	4
L1 to L5	Organizational Responsiveness	5	L4	4
M1 to M5	Product Differentiation and Innovation	5	Nil	5
N1 to N5	Cost Leadership	5	Nil	5
Total		20	2	18

In factor analysis, the Kaiser-Meyer-Olkin (KMO) value was 0.875, which is considered to be very good. The Bartlett's test of Sphericity shows a [ $\chi^2$  (153)=2969.16,  $p < 0.001$ ] with an observed significance level which is 0.00. The diagonals of the anti-image correlation matrix were all over 0.5, supporting the inclusion of each item in the factor analysis and therefore it is clear that the strength of the relationship among the variables are strong and hence it is appropriate for factor analysis. Four factors with eigenvalues over one were extracted that explained a total of 66% of the total variation in the 18 items. The four factors are: Effective Supply Chain Management, Organizational Responsiveness, Product Differentiation and Innovation and Cost Leadership. Reliability analyses were done for the items in each construct. The Cronbach's alpha values are provided in the last column of Table 3. All the values are more than 0.7.

Table 2. KMO and Bartlett's test for sustainable competitive advantage

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.875
Bartlett's Test of Sphericity	Approx. Chi-Square
	Df
	Sig.
	2969.168
	153
	.000

Table 3. Results from factor analysis for sustainable competitive advantage

Items	Supply chain management	Organizational responsiveness	Product Differentiation and Innovation	Cost Leadership	Cronbach's alpha
M4	.888				0.860
M2	.862				
M1	.825				
M3	.776				
M5	.745				
L3		.805			0.856
L2		.797			
L5		.792			
L1		.772			
N2			.859		0.881
N1			.802		
N4			.785		
N3			.776		
N5			.655		
K2				.869	0.837
K1				.867	
K4				.809	
K5				.795	

### 5.2 Confirmatory Factor Analysis (Single Factor Model)

Upon completion of the EFA, Confirmatory Factor Analysis was administered. Confirmatory Factor Analysis (CFA) CFA is particularly useful in the scales validation to measure specific construct as well as establishing the validity of a single factor model with the closest fit to the data (DeCoster, 1998).

The adequacy of the model was evaluated based on its fulfilling the criteria of reliability, convergent validity, and discriminant validity via the following:

- The **factor loadings** or path significance, is indicated by the standardized regression estimate assesses the effect of one variable on another variable. The factor loadings of latent to observed variables should be above 0.50 (Hair et al., 2006, Bryne (2010). This is also measure of construct validity.
- The **AVE** or "average variance extracted" measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error. Fornell and Larcker (1981) Hair et al. (2010) recommended the threshold value of  $R^2 = 0.50$  Should the average variance extracted is less than 0.50, then the variance due to measurement error is higher than the variance due to the construct itself. In this case, the convergent validity of the construct is violated.
- **Composite Reliability.** The commonly used threshold value for CR (Composite Reliability) is 0.70 (Hair et al., 2010) which means that all items consistently represent the same latent construct, thus establishing construct reliability. The individual item reliability of the subscales is "squared standardized factor loading.", The overall reliability of the whole scale is the "composite reliability"
- **The Goodness of Fit**

The chi-square statistic/degree of freedom as well as model fit indices such as comparative fit index CFI, GFI, AGFI, TLI, CFI, RMSEA and were examined to evaluate the adequate fit of models.

#### 5.2.1 CA1 - Effective Supply Chain Management

The initial model consisted of five observed variables (K1 – K5). In EFA, one indicator variable, K3 was dropped due to low correlation of each item with at least one other item in the construct. After dropping item K3,

a single factor model was found to be acceptable. The minimum factor loading is 0.730, [Chi-square/df is less than 3, all fit indices are more than 0.9, RMSEA is less than 0.08], indicating data fit. The AVE is 0.681 (more than 0.50) and the CR value is 0.895 (more than 0.75).

#### 5.2.2 CA2 - Organizational Responsiveness

For Organizational responsiveness construct, five indicators were utilized to measure the construct (L1 to L5). Indicator L4 was omitted from EFA due to not meeting the acceptance value of 0.3 and above. In CFA, a single factor model was found to be acceptable. The minimum factor loading is 0.508, [Chi-square/df is less than 3, all fit indices more than 0.9, RMSEA is less than 0.08]. The AVE is 0.529, which is more than 0.50 and the CR value is 0.810, which is more than 0.75 indicating model fit.

#### 5.2.3 CA 3 –Product Differentiation and Innovation

The initial model consisted of five observed variables (M1 – M5). All the five variables were retained as all of them met the acceptance value of 0.3 and above. In CFA, a single factor model was found to be acceptable. The minimum factor loading is 0.657, the Chi-square/df is less than 3, all fit indices are more than 0.9 and RMSEA is less than 0.08] indicating support for the model. The AVE is 0.634, which is more than 0.5 and the CR value is 0.895, which is more than 0.75 indicating model fit.

#### 5.2.4 CA4 – Cost Leadership

The initial model of the five variables (N1 – N5) was retained during EFA as all of them met the acceptance value of 0.3 and above. In CFA, a single factor model was found to be acceptable. The minimum factor loading is 0.657. The [Chi-square/df is less than 3, all fit indices are more than 0.9, and RMSEA is less than 0.08]. The AVE is 0.634, which is more than 0.50 and the CR value is 0.895, which is more than 0.70, indicating model fit.

#### 5.3 Testing of Multi-Factor Model for SCA

In this section, the multi-factor model for SCA, comprising of Effective Supply Chain Management, Organizational Responsiveness, Product Differentiation and Innovation and Cost Leadership was tested. This is done to establish discriminant validity between the subscales of SCA. The path diagram is shown in Figure 3 and the correlation values between the subscales are presented in Table 4.

Table 4. Fit measure for multi-factor for SCA model

Fit measure	Recommended value	Results
Chi- square $\chi^2$ P- value =0.00		180.706 P = 0.002
Degree of freedom (df)		129
CMIN/DF	Less than 3.0	1.401
GFI	>0.9	0.939
AGFI	>0.9	0.919
TLI	>0.9	0.982
CFI	>0.9	0.985
RMSEA	<0.08	0.037
AIC		264.706

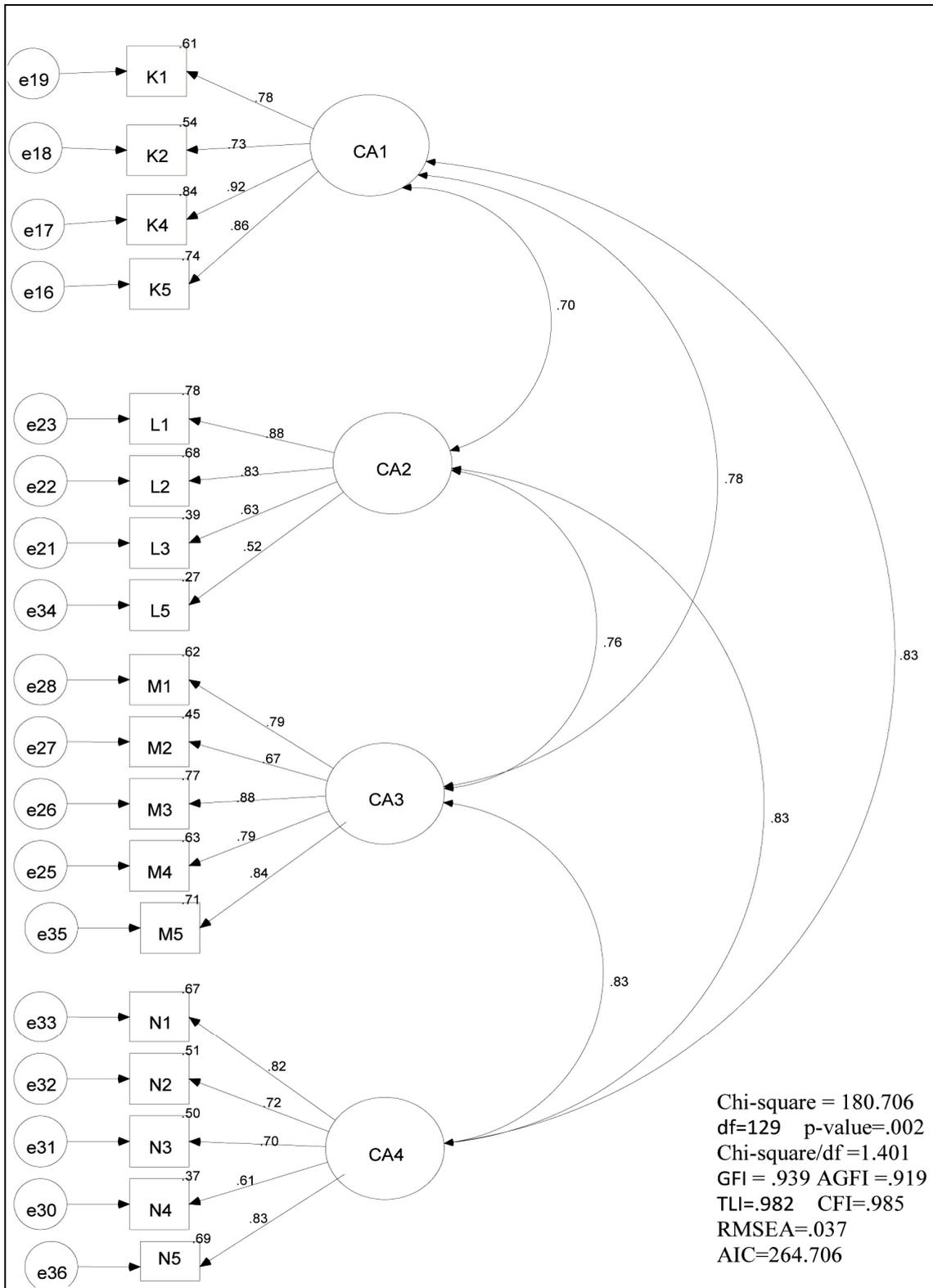


Figure 3. Multi-factor model for sustainable competitive advantage

The model shown in Figure 3 is acceptable [Chi-square/df is less than 3, all fit indices are more than 0.9 and RMSEA is less than 0.08].

Table 5. Covariance and correlation between subscales of SCA

Path	Covariance	S.E.	C.R.	P	Correlation
CA1<--> CA2	1.263	.152	8.300	***	.701
CA1<--> CA3	1.269	.149	8.439	***	.783
CA2<--> CA3	1.339	.154	8.694	***	.760
CA3<--> CA4	1.410	.160	8.831	***	.827
CA1<--> CA4	1.440	.163	8.820	***	.827
CA2<--> CA4	1.582	.171	9.268	***	.834

The correlation coefficients between the subscales, presented in Table 5 are between 0.30 (Hair et al, 2010) and not exceeding 0.85 (Sekaran, 2010). Thus, there is adequate discriminant validity between the subscales of SCA (Hair et al., 2010). Based on the analyses, there is sufficient convergent validity of the items within the subscales and there is sufficient discriminant validity between the subscales. Hence all the four hypotheses are accepted.

The overall model fit indices indicate a reasonable level of multi-factor model fit. Thus, it reasonable to believe that a second order factor model exist for the subscales of SCA.

## 6. Conclusion

In summary, the objective of this research paper is to develop a set of measurable variables that will represent 'sustainable competitive advantage' for Malaysian manufacturing industries. The findings obtained indicate that the theoretically formulated measurement criteria or dimension of SCA are significantly and positively linked with the construct 'Sustainable Competitive Advantage. It is also noteworthy that this study is perhaps the first of its kind in Malaysia for the identification of critical factors of SCA in manufacturing business organizations in Malaysia.

From the theoretical standpoint, this study offers a quantitative measurement scale that was developed to measure Sustainable Competitive Advantage. The proposed theoretical model provided in this study presents a detail examination towards the multidimensionality of SCA, which is used as a measure the bottom-line in manufacturing sector in Malaysia. As such, with this new concept, this research hopes to attract the attention of other researchers in this area as it attempts to unearth the circumstances that can contribute to the establishment of the measurement scale for sustainable competitive advantage in Malaysian manufacturing companies. The result from this research offers an imperative procedures and guidelines for the management practitioners to devise a measurement criterion for their organization. There was never a point existed whereby an organization has remain as an excellent organization on a prolonged basis. An organization can be at the top at one moment and crumbles down for slightest reason, in the next moment. What makes an organization stays afloat, then? It's the unique resources coupled with a set of appropriate managerial actions and decisions which creates a sustainable competitive advantages. Sustainable competitive advantage could not be possibly achieved by just obtaining the resources alone. As aptly put by Kay (1993), a resource only becomes a competitive advantage when it is applied to an industry or brought to a market. Hence, an organization which strives to achieve a SCA by just deploying its internal resources, without worrying about what the competitors are doing is gravely missing a vital point. If a firm continually focus on external elements; namely competition, inevitably this will direct the firm towards creating a unique resources. When this unique resources, meet two conditions; i.e. it is found to be providing value to customers and competitors failed to duplicate it, then the uniqueness organization has achieved, will give an advantage to the firm.

In summary, the objective of this research paper which is to provide a measurement criterion for Sustainable Competitive Advantage for Malaysian manufacturing organization has been achieved.

## 7. Research Limitations and Future Research

This study used cross-sectional design which captured the perceptions of managers at a point in time. Although a survey research is helpful in predicting relationships among variables, proving causal relationships among the constructs, is an uphill task. The cross-sectional design does not permit inferences about the true nature of the causal relationships among the dimensions of SCA. The cross-sectional data also does not capture these evolutionary transformations that may influence the hypothesized relationships. Hence, the dynamism of dimension would be best captured by a longitudinal study. The higher cost and longer period of time of a longitudinal study were the reasons why this study was done cross-sectionally. However, since the study provides a strong groundwork for future research, it may be modified to be a longitudinal study.

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