ANTECEDENT OUTCOMES STUDY ON GREEN VALUE CHAIN INITIATIVES: A PERSPECTIVE FROM SUSTAINABLE DEVELOPMENT AND SUSTAINABLE COMPETITIVE ADVANTAGE

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ABSTRAK

Kemunculan rantaian nilai hijau atas kesedaran tentang kepentingan alam sekitar akibat daripada daya pembangunan lestari demi memastikan pencapaian keunggulan kompetitif lestari di pasaran merupakan polar perniagaan yang tidak dapat dielakkan sejak kebelakangan ini. Hasrat muktamadnya adalah untuk mencapai suasana sosial dan alam sekitar yang harmoni, di samping mengecapi matlamat kewangan firma. Dalam projek ini, kajian keperluan keputusan rantaian nilai hijau dalam hubungannya terhadap pembangunan lestari serta keunggulan kompetitif lestari telah dijalankan ke atas 300 firma bersijil ISO 14001 di Malaysia melalui soal selidik yang dihantar menerusi pos. Keputusan berdasarkan kepada kadar pembalasan 30.0% menunjukkan bahawa pengurusan risiko, tanggungjawab sosial syarikat, dan tanggapan tentang sosio alam sekitar merupakan tiga keperluan yang paling utama sekali bagi pencapaian inisiatif rantaian nilai hijau yang lazimnya dilaksanakan menerusi aktiviti-aktiviti prima hijau serta pengurusan sumber dan kamampuan hijau. Pencapaian tersebut akan membawa kepada pencapaian keunggulan kompetitif lestari dalam bentuk prestasi kewangan serta prestasi sosio alam sekitar. Hubungan inisiatif rantaian nilai hijau yang dikaji dalam projek ini dapat menambahkan lagi ilmu pengetahuan baru ke arah pemanjangan serta memperkayakan lagi model Rantaian Nilai Michael Porter terutamanya dari segi menghubungkannya kepada daya desakan pembangunan lestari di bahagian masukan dan mencipta keunggulan kompetitif lestari di bahagian keluaran, di samping menerangkan keuntungan yang boleh dikecapi daripadanya.

ABSTRACT

Green value chain in the wake of environmental conscious due to sustainable development forces to ensure achievement of sustainable competitive advantage in market place has been perceived as an inevitable global business trends in recent years. The ultimate intention of which is to attain a harmonized social and environmental ambient besides fulfillment of financial goal of firms. In this study, the antecedent outcomes study of green value chain initiatives in relation to sustainable development and sustainable competitive advantage has been carried out by conducting a survey on 300 ISO 14001 certified manufacturing firms in Malaysia via mailed questionnaires. Results based on 30.0% response rate showed that risk management, corporate social responsibility, and socio environmental considerations stand out to be the three utmost important antecedents of green value chain initiatives, which are being executed through green initiatives, and green resource and capability management. These in turn, lead to achievement of sustainable competitive advantage in terms of financial performance and socio environmental performances. The antecedents and outcomes relationship in respect to green primary activities, and green resource and capability management as being established in this study can add considerably novel knowledge towards extension and enrichment of Michael Porter's Value Chain Model especially in terms of linking it to the sustainable development driven forces at the input and creating sustainable competitive advantage at the output besides uncover the practical benefits that can be gained thereof.

CHAPTER 1

INTRODUCTION

1.0 Introduction

Towards the inception of new millennium, the world has quickly taken an entire new look against the evolution of novel manufacturing practices in the wake of growing environmental conscious (Zhu & Dou, 2007), whereby firms attempt to out-perform each other through creation of a nexus of Sustainability Development strategies via implementation of various environmental initiatives along the value chains (Handfield *et al.,* 1997; Arifin *et al.,* 2009) which span across the entire customer order cycle, start right from the beginning of raw material procurement, systematically treading through the designing, manufacturing, assembling, packaging, and logistics stages, and finally deliver to the hands of customers via distribution networks (Grunert & Hildebrandt, 2004).

The roll-out of the ISO 14001 Environmental Management System (EMS) is in fact driving this type of transition towards a time where environmental friendly practices are no longer be an optional business practice, but rather a competitive necessity for survival (Handfield *et al.,* 1997). Grunert and Hildebrandt (2004) ascribed the changes that firms undertake toward development of special skills for adaptability and innovativeness to the environmental dynamics forces. These green trends of conserving the Earth's resources and protecting the environment are thereby exerting irresistible pressures on corporate manufacturing practices, and hence anew the entire manufacturing culture through rapid globalization influences, especially with the advancement of the information technology system (Chien & Shih, 2007).

In the process of evaluating the environmental consideration, firms need to shift its paradigm from the conventional departmental time-static worldview to a more holistic perspective which can effectively enable the observers to envision the interconnection between economic growth, environmental and social responsibility (Setthasakko, 2009). Such efforts will eventually result in cleaner, safer operations, reduced usage and acceptable substitutions for hazardous substances, increased product recyclability and recovery, and improved transparency of information available to all stakeholders (Dawes, 2009). Currently, whenever sustainable is the topic of discussion among industry partners, such as in the electronics and chemical industries, the focus is strongly influenced and determined by regulatory requirements, in particular related to end-of-life or reverse logistics management of products. In this light, future developments related to sustainable that might become more real to industry in years to come is expected to widen to encompass green marketing, communication, change management, and green value chain management (Takata & Umeda, 2007).

This study, however, will only address the issue of green value chain initiatives as a focus of this study. It is believed that a green value chain is a promising area of study that has the potential to provide significant benefits to firms and the society. Accordingly, the study starts with this introductory chapter which gives general idea about the research topic and problem of the study. The chapter starts with providing background of the study. The background includes also discussions on the evolution of green value chain. The chapter then followed by the problem of the study, the research questions and objectives. Next, the chapter portrays the significance of the study, expected contributions and its focus. The chapter ends with defining the key terms of the study and organization of the thesis.

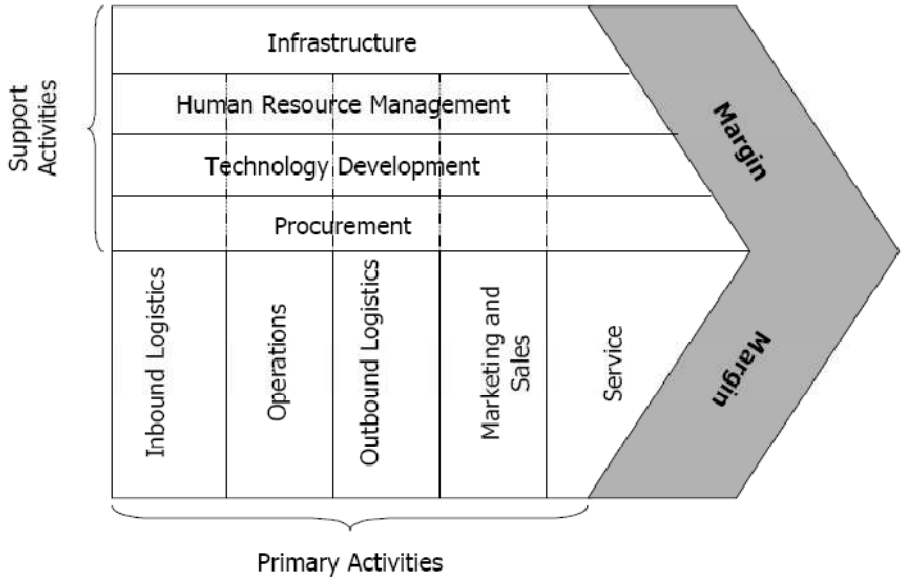
1.1 Research Background

Conventional practices of manufacturing firms often perceive pollution as an inevitable by-product give rise due to economic activities, and habitually utilize natural environment as a sink to dispose of this pollution. This has led to the pollution of three main geo-chemical reservoirs *i.e.* atmosphere, biosphere and hydrosphere on which mankind depend on for survival (Gandhi *et al.*, 2006). Reciprocating to these irresponsible actions which invariably cause pollution to the eco system, manufacturing firms have, over the last decades, gradually been moving toward achieving greater environmental awareness mainly attributable to two sets of pressures, namely public concerns and green consumer movement. The former often result in establishment of environmental legislation, while the latter has exerted great influences on the manufacturing practices (Sarkis & Rasheed, 1995). These emerging pressures hold manufacturing firms as one of the responsible parties for contributing towards the environmental pollution (Tan *et al*., 2002). Advancement of information technology has also enabled environmental pressure in one region to be spread rapidly to other parts of the world and these environmental concerns are expected to cause significant fundamental changes in products design and technologies employed (Green *et al.*, 1998). If an organization has environmental liabilities, stakeholders may often hold the lead firm in a particular supply chain responsible for the adverse environmental impacts of all organizations within a specific supply chain for a particular product (Rao & Holt, 2005).

Most often, environmental issues are being viewed as a partnership effort between the industry and the public community in general, whereby effective environmental management is truly perceived as a potential factor in not only enables manufacturing firms enhancing its financial performance but also in creating

sustainable competitive advantage (Rao & Holt, 2005). Proactive firms, which consider environmental concerns as part of the quality management via internalization of the environmental challenges and optimization of the resources in meeting its customer needs and handle environmental issues (Handfield *et al.*, 1997), will integrate eco-design considerations as early as possible into product realization process as this will introduce flexibility in making changes and improvements to products (Donnelly *et al.*, 2006). By adhering to this, firms perceive that they will be rewarded by gaining entry into the global market (Tan, 2005).

The ways by which one company can differentiate itself and gain market share over another can be analysed by using the Value Chain model (Schatzberg *et al.*, 1997). The value chain approach was developed by Michael Porter in 1980s in his book "Competitive Advantage: Creating and Sustaining Superior Performance" (Porter, 1985). Value chain can be seen as a collection of activities that a firm undertakes in order to provide the offering to the market; with the attributes that the market wants, and with the price that the market is willing to pay. The concept of value added, in the form of the value chain, can be utilized to develop an organization's sustainable competitive advantage in the business arena of the 21st century. All organizations consist of activities that link together to develop the value of the business, and together these activities form the organization's value chain. As depicted in Figure 1.1, such activities may include purchasing activities, manufacturing the products, distribution and marketing of the company's products and activities (Lynch, 2003). Since then, the value chain framework has been used as a powerful analysis tool for the strategic planning of an organization for nearly two decades. The aim of the value chain framework is to maximize value creation while minimizing costs.



(Source: Adopted from Creating and Sustaining Superior Performance, Michael E. Porter, 1985)

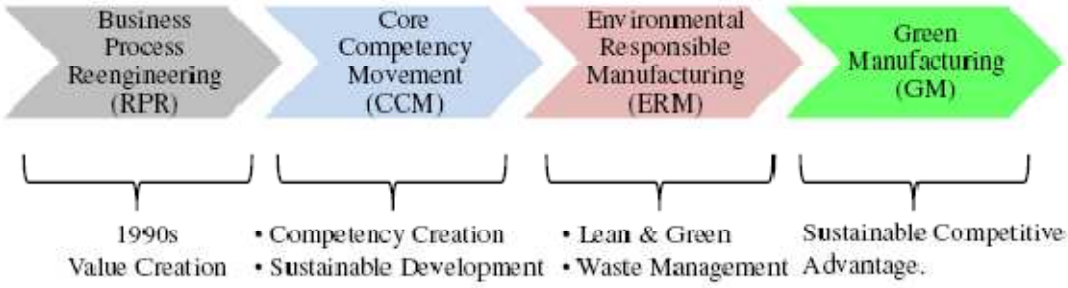
Figure 1.1. Value Chain Model by Michael Porter.

In conjunction to the Value Chain, corporate and operational managers strive to create more value by optimizing the supply-chain activities. Optimization of supply chain activities means competition from other firms, primarily on cost-efficiency (Takata & Umeda, 2007). They argued that the optimization of supply chain activities alone cannot always yield a source of competitive advantage. This is for the simple reason that value chain not only seeks to do away with the activities that do not add value, but establishes the importance of other support activities, including infrastructure, technology, and so on, that play a vital role in providing the foundation for competitive advantage (Lynch, 2003). Value chain's primary activities are similar to the primary functions of the supply chain. Where supply chain focuses on efficiency of every function, value chain focuses on the functions that are critical to be effective. Although efficiency can be termed as the hygiene factor, it is this effectiveness that has the potential to provide a scope for competitive advantage. The primary and secondary elements of the value chain and their interrelationships make

the value chain behave as a complex system, where the system mostly remains in a seemingly critical state of instability (Ahmed & Sharma, 2006). They suggested that instability can be seen as the opportunity for the strategic managers to provide a basis for competitive advantage. Such instability, which is mainly attributable to the ever changing customer perceived value, can best be depicted by the evolution of green value chain as elaborated in subsequent section 1.2.

1.2 Evolution of Green Value Chain

The concept of a value chain has assumed a dominant position in the strategic analysis of industries over the past decades (Peppard & Rylander, 2006). Following a wave of change termed as Business Process Reengineering (BPR), that began in 1990s (Figure 1.2), manufacturing firms worldwide started to give due emphasis on the crucial importance of processes in value creation and management by adopting TQM and JIT management tools (Hammer, 1990). The subsequent impetus which further stressed the need for firms to develop technology-based and organizational competencies that could not be easily imitated by their business rivals was boosted under the second wave of change which was termed as Core Competency Movement (CCM) (Hamel & Prahalad, 1994). The confluence of the Business Process Reengineering and Core Competency movement had eventually engendered in unbundling of value chains, outsourcing, and innovations in contracting and supply chains. The trends which was centered on the supply chain has inspired similar trends at the corporate level as firms evolved from lean operations to lean enterprises and then to lean consumption (Kleindorfer *et al*, 2005).



(Source: Adapted from Value Chain to Value Network: Insights for Mobile Operators by Peppard & Rylander, 2006)

Figure 1.2. Evolution of Green Value Chain.

As the new economic order unfolded, and concurrently, there has been increasing public attention placed on the overall condition of the natural environment. Manufacturing firms started to realize and recognize that the long-term success of firms actually lies not only on the profitability of business, but also the future of people and the future of the planet Earth. Waste generation and depletion of natural resources are said have outstripped the earth's ability to recuperate (Beamon, 1999). These new legitimacy concerns, which are being captured in the concept of 3P namely People, Profit and Plane, are well aligned with the concept of sustainable development. Another relatively new concept which is well in line with the green value chain concept is termed as Environmental Responsible Manufacturing (ERM). Fundamental to ERM rests on the recognition that pollution, irrespective of its type and form, is all waste. By minimizing waste, firms can reduce disposal costs, and permit requirements, avoid environmental fines, boost profits, discover new morale, protect and improve the state of the environment (Curkovic, 2003).

The inception of 21st century sees the emergence of another imperative modern manufacturing strategy namely Green Manufacturing, which integrates all issues related to manufacturing with ultimate goal to reduce and minimize

environmental impact and resources consumption during a product life cycle inclusive of designing, synthesis, processing, packaging, transportation, and the use of products in continuous or discrete manufacturing industries. Pursuing the Green Manufacturing strategy would enable manufacturing firms to effectively allay the environment burdens (Tan *et al*., 2002).

1.3 Problem Statement

In view of the increasingly wide-spread adoption of the ISO 14001 standards, it is expected that there will be reaching such a time where emphasis on green value chain (GVC) via implementation of the Environmental Management System will sooner or later become a norm among the manufacturing firms in Malaysia, whereby benefits of which are evidently clear, such as increasing in overall operating efficiency; reduction in energy usage; cost saving through recycling of product inputs; improved product and service quality; less rejects and reworks; reduced packaging cost *etc*. (Tan, 2005).

Extensive literatures review indicated that most of the research studies carried out thus far is in fact merely concentrated on Green Supply Chain management per se (Beamon, 1999; Ofori, 2000; Hervani *et al*., 2005; Zhu *et al*., 2005 Ferretti *et al*., 2007; Chien & Shih, 2007; Zhu & Dou, 2007; Simpson *et al*., 2007; Zhu *et al*., 2008) and in most of the circumstances, these researches tend to focus on single aspect such as Green Purchasing (Green *et al*., 1998; Geng & Doberstein, 2006; Eltayeb & Zailani, 2009), Green Design (Madu *et al*., 2002; Pujari *et al*., 2003; Knight *et al*., 2009; Eltayeb & Zailani, 2009), Green Production (Tan *et al*., 2002; Taylor, 2005), Green Consumption (Spaargaren & Mol, 2008), Reverse Logistics (Eltayeb & Zailani, 2009) *etc*., as oppose to investigate from the perspective of green value chain (Sarkis &

Rasheed, 1995; Caldwell & Smallman, 1996; Handfield *et al*., 1997; Solvang *et al*., 2006; Dahlstrom & Ekins, 2006).

Even if such studies may have been carried out, majority of them covered only the ostensible aspects of green value chain and the linkages with its antecedent such as sustainable development (Callens & Tyteca, 1999; Bond *et al*., 2001; Mog, 2004; Gandhi *et al*., 2006), and rarely they covered the linkage between green value chain and sustainable competitive advantage (Rao & Holt, 2005).

From the aforementioned findings, it can be inferred that albeit more and more management theorists have begun to consider ecological and green sustainability as a study framework for organization, little prior theories exist to ground testable hypotheses concerning the antecedent and outcome effects in creating the green value chain from the perspective of sustainable development, and the contribution of green value chain in leading towards creation of the sustainable competitive advantage. Lacking understanding of which may culminate in underestimating the important and crucial roles lead by these very important dimensions in the efforts of creating effective future sustainable strategies for the manufacturing firms. With these arguments in mind, questions arise about as to what extent does sustainable development contribute towards creation of green value chain for the manufacturing firms in Malaysia and to what extent does green value chain contribute towards creation of sustainable competitive advantage for the manufacturing firms in Malaysia?

1.4 Research Objectives

The primary objectives of this research paper are:

i. to examine the effects of antecedents of green value chain initiatives adoption from the perspective of sustainable development, and

ii. to investigate the outcomes of green value chain initiatives in relation to sustainable competitive advantage.

1.5 Research Questions

This study will be conducted to answer the following research questions:

i. To what extent does sustainable development contribute towards creation of green value chain initiatives for the manufacturing firms in Malaysia? and

ii. To what extent do green value chain initiatives contribute towards creation of sustainable competitive advantage for the manufacturing firms in Malaysia?

1.6 Significance of the Study

This research study, which is intended to cover the gaps identified through the subsequent literature review as elaborated in problem statement, aims to give due contributions in providing an insightful explanation as to how and to what extent the causal relationship between green value chain initiatives and its antecedent *i.e.* sustainable development, and between green value chain initiatives and its outcome *i.e.* sustainable competitive advantage in creating sustainable long-term strategies for the manufacturing firms in Malaysia.

1.7 Research Contributions

This study attempts to enrich the extant published literatures by identifying types of antecedents that significantly drive manufacturing firms towards implementing green initiatives along the value chains, and at the same time, to evaluate the outcomes benefited therefrom. More precisely, the study contributes in terms of theoretical and practical as enumerated and elaborated follows:

1.7.1 Theoretical Contributions

A prior study conducted by Wisner *et al*. (2003) shows that firms with an alignment of management, strategic planning, and proactive managerial actions toward environment performance are the firms that achieve the best environmental performance. Better environmental performance, in turn, is significantly and positively related to measures of return on investment and earnings growth. The study however did not elaborate as to what way the firm resources can be put at optimal use. Clemens and Douglas (2006), however, pointed out that although voluntary green initiatives is positively related and driven by both the external coercion forces and internal firm resources forces, this relationship is however contextual in nature. As the internal firm resources become superior, it dampens the relationship between external coercion and voluntary green initiatives. These findings seem to be interesting as in real industrial practices, the synergistic effect of the coexistence of compliances to legislative requirements and establishment of superior firm resources are in fact basic necessities that completely out-weighed the dampening effect. This implies that there must be other reasons that why their consistent is important.

Given that existing knowledge on green value chain is still lacking, this study intends to add considerable knowledge towards extension and enrichment of Michael Porter's Value Chain Model in creating sustainable competitive advantage according to the needs of 21st century which give due emphasis and focus on achieving sustainable resource consumption in maintaining harmonic living environment. Furthermore, the study also aims to identify the outcomes benefited thereof, which can add to the knowledge about the value and importance of implementing green value chain to organizations and the society at large. Besides these, the knowledge

can also enrich theories as how optimization of the usage of firm resources can be gained through green value chain initiatives which flow outside-in from customers.

1.7.2 Practical Contributions

Al-Mudimigh *et al*. (2004) had pointed out that it is important to focus on processes and identifying core critical activities within organizations that have high leverage abilities, which can enable organizations to define their value propositions. It is also equally important to have a clearly defined value chain strategy, that is deployable and that can be monitored on a regular basis that can deliver the wished and levels of ambitions of any organization concerned. Nevertheless, their study did not outline the ultimate benefits that can be derived thereof. This is important as knowing the benefits can serve as important drivers for firms to pursue green initiatives within the organization.

Arifin *et al*. (2009) had, based on their research conducted on manufacturing firms in Malaysia found out that, albeit an Integrated Management System which encompasses quality, environmental, safety and health acts as a far better and more dynamic model in management today, organizations are more likely to adopt the novel concept if they are furnished with more information on the benefits of the system. Such information can normally be obtained through participation in eco-network (Stormer, 2008). For example, Eltayeb and Zailani (2009) had found out that firms that participate in green-interested associations have significantly higher level of adoptions of green initiatives than firms that do not participate; firms with large supplier base are found to be significantly higher in green purchasing and eco-design than firms with lower supplier base. Therefore, this study is intended to uncover the

benefits that can be gained from green value chain, especially in achieving long term sustainable competitive advantage.

1.8 Definition of Key Terms

In order to clarify the language used in this study, the following definitions have been chosen:

Sustainable development (SD) is being defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987).

Legal dimension encompasses identification and compliance to legal requirement that are applicable to the environmental aspects of an organization, inclusive of (i) national and international legal requirements; (ii) state / provincial / departmental legal requirements; and local governmental legal requirements (International Organization for Standardization, 2004).

Social dimension, within the context of this study, is defined as initiatives toward meeting the expectation of persons or group whom are concerned with or affected by the environmental performance of an organization (International Organization for Standardization, 2004).

Environmental dimension, within the context of this study, is defined as initiatives towards identifying, control, and monitoring of environmental aspects and impacts, as well as to maintain a properly executed Environmental Management System within the organization (International Organization for Standardization, 2004).

The fundamental concept of *Triple bottom line* was built under the premise that the overall performance of a company should be measured based on its combined contribution to *economic* prosperity, *environmental* quality and *social capital* (Commission of The European Communities, 2001).

Cost dimension, within the context of this study, is defined as initiatives towards lean manufacturing as part of a manufacturing survival strategy with the intention of mitigating business risk through gaining of benefits derived from effective cost management (Groth & Kinney, 1994; M.ortimer, 2006).

Corporate social responsibility (CSR) is a concept whereby firms decide voluntarily to contribute to a better society and a cleaner environment by integrating social and environmental concerns in their business operations and in their interaction with their stakeholders (Commission of The European Communities, 2001).

Risk concerns the probability and consequences of the failure of a strategy (Johnson *et al.*, 2008). Within the context of this study, *risk management*, which can be deemed as one of the central part of the organization's strategic management, is the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustainable benefit within each activity and across the portfolio of all activities. The focus of good risk management is to identify and minimize these risks with the objective to add maximum sustainable value to all the activities of the organization. (The Institute of Risk Management, 2002).

A value chain can be defined as the set of activities spanning the entire customer order cycle, including design, procurement, manufacturing and assembly, packaging, logistics, and distribution (Handfield *et al*., 1997). A *green value chain* (GVC) incorporates a new dimension of value into the traditional value chain, namely, environment (Solvang *et al.*, 2006).

Primary Activities are those activities that are directly concerned with the creation or delivery of a product or service. *Green primary activities* are defined as primary activities which are incorporated with dimension of environment (Johnson *et al*., 2008).

Resources are the physical capital, human capital, and organizational capital owned or controlled by a firm that can be used to conceive of and implement strategies. *Capabilities* reflect a firm's ability to combine resources that the organization can muster in ways that promote superior performance in spite of the opposition stemming from the competition and circumstances. *Green resource and capability management* is defined as ways to control the underlying resources and capabilities available within a firm to ensure meeting of its strategic objectives by taking into consideration dimension of environment (Dehning & Stratopoulos, 2003; Solvang *et al.*, 2006).

Environmental, Safety and Health (ESH) Training is defined as training which is intended to ensure that persons performing tasks that have the potential to cause a significant environmental impact are competent on the basis of appropriate education, training, or experience (Madsen & Ulhoi, 2001; International Organization for Standardization, 2004).

Sustainable competitive advantage (SCA) is competitive advantage that resists erosion by competitor behavior (Bharadwaj *et al.*, 1993).

Financial performance refers to the importance of the pecuniary outcomes derived from business activity. Measures of financial performance can be based on accounting data or market value (Benito & Benito, 2003).

Social performance is defined as an organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationship (Orlitzky, 2000).

Environmental performances are measurable results of an environmental management system related to the control of its environmental aspects. Assessment of environmental performance is based on environmental policy, environmental objectives and environmental targets (International Organization for Standardization, 2004).

1.9 Organization of Remaining Chapters

In order to enable the research to be conducted in a much more systematic and well organized manners, Chapter 2 will be started with extensive and detailed literature review which is to cover theories, findings, knowledge, and ideas that had been established by previous scholars and researchers in this particular topic. In Chapter 3, a theoretical research design framework and hypotheses will be formed and relevant research methodology will be proposed. Research data collected thereafter will be duly analyzed by using SPSS technique and results inferred thereof will be presented

in Chapter 4. This will be followed by detailed discussions in Chapter 5, which are to be supported by established literatures' findings. Final conclusions will be made and due recommendations will also be suggested for future research.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Increasing awareness of environmental protection worldwide, and the pressure accompanying globalization has prompted manufacturing firms to improve their environmental performance (Chien & Shih, 2007), and to address all environmental related issues in order to maintain customers, exist, and thrive in an ever more critical global economy (Chavan, 2005). This environmental preoccupation appeared to become part of sustainable development (Callens & Tyteca, 1999). Sustainable development often been cited as one of the main mechanism for changing the economic growth. Nevertheless, one of the main barriers to sustainable industrial development rests on how to implement these sustainable strategies, or more importantly, how to introduce them into the existing practices whilst ideally improving competitiveness (Baldwin *et al*., 2005). Accordingly, this chapter contains the literature review on the differences of value chain versus supply chain, green value chain initiatives, the sustainable development and the sustainable competitive advantage.

Two underlying fundamental theories, *i.e*. Value Chain Theory and Resource Based Theory, will be cited to support the findings and discussion of this research study. Effective value chain management often provides organizations with the opportunity to develop value proposition via identification of their core competencies as well as to develop synergy levels and seamlessness between various activities in converting customer needs into outputs. By doing these, it will enable organization to

position themselves in the market place (Al-Mudimigh *et al*., 2004). This Value Chain concept, which is also the staple idea in the management and research literature nowadays, has in fact become the focus for evolving strategies, enterprise models, and numerous efforts at improving business performance (Feller *et al.*, 2006). The Resource Based Theory, on the other hand, articulates that the very basis of sustainable competitive advantage of an organization stems from its capabilities such as value, rareness, inimitability and organization. Successful firms use their capabilities to add value by using these capabilities in a proactive way and by demonstrating appropriability, or the ability to realize the benefits of a distinctive capability for the benefit of the organization itself (Matthews & Shulman, 2005).

2.1 Value Chain Theory

The term "Value Chain" was first been introduced by Michael Porter (1985) in his book "Competitive Advantage: Creating and Sustaining Superior Performance" as a tool for identifying ways to create more customer value. Porter articulated that the source of superior performance in competitive markets is the competitive advantage of the firm. According to the value chain model, the competitive position of an organization is closely related to the activities that an organization performs in creating value and cost in a specific business. These nine value creating activities consist of five primary activities and four support activities. The primary activities cover the sequence of inbound logistics, operations, outbound logistics, marketing and sales, and service. The support activities, on the other hand, comprised of procurement, technology development, human resource management, and firm infrastructure. The terms "Margin" implies that an organization can realize the desired profit margin depending on their ability to manage the linkages between all activities

in the value chain. In order words, the organization is able to deliver a product or service for which the customer is willing to pay more than the costs of all activities in the value chain (Kotler & Keller, 2006). In this study, the value chain is driven by customer and organizations are perceived can create sustainable competitive advantage by greening all relevant activities along the value chain.

2.2 Resource-Based View Framework

There are to-date exist two most extensively applied complementary models with respect to the research of competitive advantage, both of which are simultaneously grounded in economic theory. The first model, which is a typical market-based model, focuses on achieving competitive advantage through Porter's three generic strategies *i.e*. (i) Overall cost leadership; (ii) Differentiation; and (iii) Focus. This theory of competitive advantage is mainly driven by external factors. Conversely, the second model, which centers on the firm's resources and is driven by factors that are internal to the organization, mainly focuses attention both on the resources endowments of firms and on the characteristics of resources that cause asymmetries to persist (Reed *et al.*, 2000; Fahy, 2002).

According to the Resource-based View framework, the firm is viewed as a nexus of resources and capabilities that are not freely bought and sold in the spot market. These resources encompass all input factors such as tangible and intangible, human and nonhuman, that are owned and controlled by the firm and that enter into the production of goods and services to satisfy customers' needs. A fundamental premise of the resource-based view is that organizational competencies that are heterogeneous and immobile form the basis of sustained competitive advantage (Lado & Wilson, 1994).

Two key features appear to be germane, *i.e*. the resources must enable the creation of value and must also resist the imitation efforts of competitors (Barney, 1991). Idiosyncratic resources that provide operational superiority or help create a superior market position allow the firm to earn above normal returns. In this Resources-based View theory model, sustainability of advantage relies heavily upon those inimitable resources, that are inclusive of assets, capabilities, organizational processes, firm attributes, information, and knowledge. These inimitable resources can then be further classified in terms of physical, human, or organizational capital. Unlike the physical capital, human and organizational capitals are being perceived as the real main drivers of competitive advantage as they are not as easily acquired in factor markets (Reed *et al.*, 2000). Intangible resources, which encompass intellectual property rights of patents, trademarks, copyright and registered design; contracts; trade secrets; knowledge; subjective resources of know-how; networks; organizational culture; and the reputation of product and firm; employees' ability to manage change *etc*. are all key determining resources of sustainable competitive advantage (Hall, 1993). The properties of resources that generate asymmetries and inimitable in the short run include regulatory protection (Hall, 1992), scale (Collins & Montgomery, 1995), and causal ambiguity generated by high levels of tacitness, complexity and specificity (Reed & DeFillipi, 1990).

In contrast to explicit knowledge, which is conscious and can be put into words, tacit knowledge entails information that is difficult to express, formalize, or share. Tacit knowledge develops when unconscious, inductive mental processes create a presentation of the structure of the environment showing the relationship between important variables. Because tacit knowledge is much harder for competitors to copy than explicit knowledge, the ability to capture and transfer tacit knowledge is

the key to developing sustainable competitive advantage (Lubit, 2001). Hence, as being pointed by Lado and Wilson (1994), the Resource-based View, by nature, is more appropriate to handle issues pertaining to strategy process. Gavronski *et al*. (2008) argued that the main objective of formulating a resource utilization strategy is to maximize the revenues generated by these resources.

In this study, effective resource and capability management is an essential factor toward achieving sustainable competitive advantage. Most often, experience that firms gained from green value chain exercises are unique to firms, ambiguous in context, and may develop into organizational culture and core competency of the firms which is hard to imitate by their competitors.

2.3 Value Chain versus Supply Chain

The Value Chain concept, which was epitomized by Porter (1985), defined "value chain" as the combination of nine generic value added activities that work together and are being practising within a firm to provide value to customers. Value, within the context of Michael Porter's Competitive Advantage framework, is being perceived as the amount buyers are willing to pay in return for what a firm provides. According to Houlihan (1987), the value created is then managed through what has been referred to as the supply chain. Al-Mudimigh *et al*. (2004) and Feller *et al*. (2006) had later extended the definition of value to a broader extend:

i. Value is perceived by the customers rather than objectively determined by the seller;
ii. Value is a subjective experience that is dependent on context and varies in the eyes of the beholder;

iii. Value occurs when needs are met through the provision of products, resources, or services;

iv. Value is an experience, and it flows from the customers; and

v. Value typically involves a trade-off between what the customers receive and what they give up to acquire and use a product or service.

Dekker (2003) defined value chain as the horizontal linked set of value-creating activities all the way from basic raw material sources for component suppliers through the ultimate end-use product delivered into the hands of final customers. The primary focus in value chains is downstream-pivoted, mainly on the benefits that accrue to customers, the interdependent processes that generate value, and the resulting demand and funds flows that are thereof created. Because value is derived from customer needs, activities that do not contribute to meeting these needs are being considered as "non value-added" waste which deserved attention and actions (Feller *et al*.,2006). By continuously improving material transformation process, a manufacturing system aims to constantly reduce costs and increase value-added to its products and services. (Solvang *et al*. 2006). Hence, effective value chains will eventually lead to top line improvement or profit generation. In additional to these underpinning traditional dimensions, the connotation of value chain has been evolved, further refined and extended to embed environmental aspects. The newly transformed concept is emerged as green value chain. In order to be successful with the environmentally-friendly practices, environmental strategies must be integrated into all stages of the value chain (Feller *et al*., 2006).

Rabelo *et al*. (2007) defines supply chains as life cycle processes to support the physical, information, financial, and knowledge aspects for moving products and services from suppliers to customers. Ketchen *et al*. (2008), on the other hand, defines

supply chain as a system of people, activities, information, and resources involved in creating a product and then moving it to the customer. As the name implies, the primary focus in supply chains is upstream-pivoted, mainly on integrating supplier and producer processes, reducing waste and costs, improving efficiencies of supply, and the flow of materials from their various sources to their final destinations. The goal of managing the supply chain is the creation of value for both customers; in the form of high quality products, and the supply chain partners; in the form of increased profits. Thus, efficient supply chain management will lead to bottom line improvement or costs reduction (Feller *et al.*, 2006; Rabelo *et al*. 2007). An integrated supply chains flowing from supplier, to manufacturer, to customer and reverse logistics, which is closing the loop is termed as Green Supply Chain Management (GSCM) (Zhu *et al.*, 2005). Similarly, when green purchasing, green manufacturing, green distribution, green marketing and reverse logistics are being combined together, they form what is termed as Green Supply Chain Management (GSCM) (Chien & Shih, 2007).

According to Al-Midimigh *et al*. (2004), value chain management is concerned primarily, with the customer from start to finish whereby supply chain becomes only a subset to value chain. Feller *et al*. (2006) summarized the relationship between a value chain and a supply chain as complementary views of an extended enterprise with integrated business processes, which enable the flows of products and services in one direction, while value as represented in terms of demand and cash flow in other direction (Figure 2.1).