

“Enviroprenurial” Value Chain - A Conceptual Framework for Malaysian Small and Medium Enterprises

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Abstract

This research article discussed on the managerial aspects, concepts and research implications of an “enviroprenurial” value chain. The rapidly growing environmental concern has given a unique window of opportunity which may enable organisations to become a leader in green market. In parallel to this advancement, the concept of environprenurial value chain is needed as the coordination of conventional supply chain is not sufficient to support the enhancement of environmental innovations between partners. Enviropreneuership Value Chain (EVC) is the formulation and implementation of environmentally beneficial business policies in the supply network. It is believed to positively impact the green innovation of the organisation, as well as the operational performance. This study aims to explore the determinants of innovative enviroprenurial value chain that could enhance the development of green products and processes. A conceptual framework of EVC is developed. The framework consists of three stages of processes, which include inbound, production and outbound stages.

Keywords

Value Chain, Green supply chain, SME

1. Introduction

The business organisations experienced numerous introductions of further strict regulations on the environmental issues. Europe, for instance, recently introduced tariffs for imported products of polluting industries (TheAge 2010). This ever-increasing pressure challenges organisations to pursue more environmental initiatives. The importance of environmental concerns affects not only large organizations but also, small and medium sized–enterprises (SMEs). To cope with the competitive conditions of the market and to meet stakeholders’ requirements (eg government, consumers, NGOs, etc.), organisations are required to change their attitudes towards the environment. In many of the environmental initiatives drivers, green supply chain was cited. Due to the complex nature of environmental initiatives and the nature of the small and medium sized businesses, the attempts to pursuing environmental innovations were insufficient (Rasi, Amir et al. 2010). Therefore, the concept of “enviroprenurial” value chain is needed to enhance the SMEs commitment in green initiatives voluntarily.

Recent research (Halila 2007; Besser and Miller 2010; Lambert and Schaeffer 2010; Nieto and Santamaría 2010; Lin 2012) on organizational innovation stresses the critical role of networking activities especially for SMEs in promoting innovativeness in green technologies. The forming of partnerships has proved to be a successful approach to sustainable development (Winz, Brierley et al.) by many scholars (see Collins, Lawrence et al. 2007; Vachon and Klassen 2008; Posch 2010). Networks enable SMEs to access new knowledge, share risk and pool resources that increase their ability to identify innovation opportunities; they also help SMEs comply with regulatory and social norms. Nevertheless, with respect to environmental issues there is still scant research on the strategy development to implement “EVC”, specifically targeting SMEs. In this study, we used the term ‘enviroprenurial’ value chain that describes the collaborative networking between organisations and stakeholders to pursue mutually valuable missions.

2. Value Chain

The concept of value chain was suggested by Michael Porter in 1985. The concept becomes a famous approach for ideas generation and strategies formulation until now. A value chain is a set of activities that an organization carries out to create value for its customers (Porter 1985). The value chain reviews the internal processes or the entire activities of an organization as early as from the stage of designing, selecting material and suppliers, producing, marketing, and delivering until servicing or supporting activities. The notion of the value chain is to concentrate on the actions taken in each activities to add value to those activities (Lauridsen, 2011).

There are two categories of activities which are primary activities and support activities. Primary activities relate directly to the physical creation, sale, maintenance and support of a product or service. The primary activities are:

1. **Inbound Logistics**, which involve relationships with suppliers and include all the activities required to receive, store and disseminate inputs.
2. **Operations** are all the activities required to transform inputs into outputs (products and services).
3. **Outbound Logistics**, which involve relationships with customers and include all the activities required to collect, store and distribute the output.
4. **Marketing and Sales** are activities that inform buyers about products and services induce buyers to purchase them and facilitate their purchase.
5. **Service** includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

The support activities relate to all activities that act as a backbone to the primary activities. The activities are:

1. **Procurement (purchasing)** involve in purchasing raw materials, supplies and other consumable items as well as assets; finding vendors and negotiating best prices.
2. **Human resource management (HRM)** which helps company to recruits, hires, trains, motivates, rewards, and retains its workers. People are a significant source of value, so businesses can create a clear advantage with good HR practices.
3. **Technological development** which activities relate to managing and processing information, as well as protecting a company's knowledge base. Minimizing information technology costs, staying current with technological advances, and maintaining technical excellence are sources of value creation.
4. **Infrastructure** is a company's support systems, and the functions that allow it to maintain daily operations. Accounting, legal, administrative, and general management are examples of necessary infrastructure that businesses can use to their advantage.

Figure 1 illustrates the interrelation between primary activities and support activities.

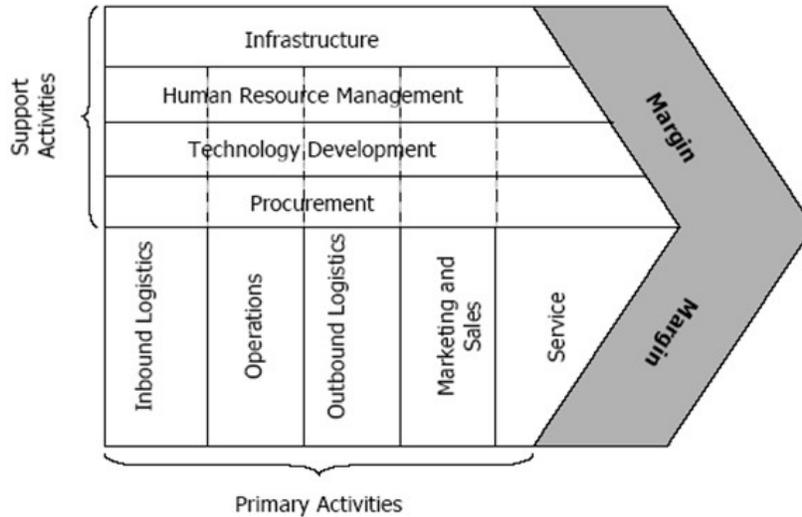


Figure 1: Generic Value Chain (Porter, 1985)

3. Enviropreneurial Value Chain

The Enviropreneurial Value Chain (EVC) was an extension of the theory of value chain by Michael Porter (1985). The EVC developed by Hartman and Stafford (1998) to include ecological considerations in value chain. The concept of environprenurial value chain uses similar principles as conventional supply chain management with some special attention and endorsement on the products and services related to the products. Enviroprenuership is the formulation and implementation of environmentally beneficial business policies and actions that simultaneously uphold market positions and generate profits. Basic notion of environprenurial value chain is to ensure that the ecological quality of the products is maintained throughout entire supply chain, which begins during the sourcing, manufacturing and distributing of the products. During each stage, it is important to ensure that organisations always consider and plan for pollution prevention. The extend framework was shows below in Figure 2:

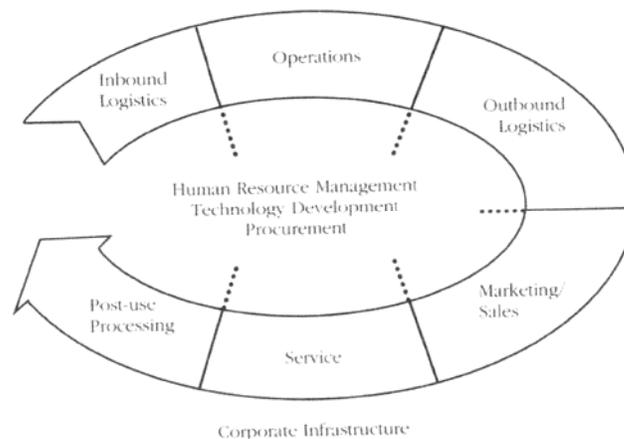


Figure 2: Enviropreneurial Value Chain (EVC) (Hartman and Stafford 1998)

In the EVC, the primary activities have been reshaped to circular processes to be able to close the production loop. The EVC model is different from the value chain model developed by Porter which is obviously a one-way single-flow model (see figure 1) and is not tended to include cyclic material flows. The cyclic flow of material in a chain would suggest that the operations or fabrications of the products or services will have no depletion of resources and no creation of useless materials or material combinations, currently called waste (Cardon et al., 2011). The EVC added the strategies to each activity in value chain to improve green awareness, to reduce cost and at the same time, create competitive advantage. Table 1 shows the strategies of EVC at each stages of production.

The Enviropreneurial strategies were added is shown below:

Table 1: Enviropreneurial Value Chain: Activities and Strategies (Hartman & Stafford, 1998)

EVC Primary Activities	Enviropreneurial Strategies
Inbound Logistics	<ul style="list-style-type: none"> • Collocation • Energy-efficient, reduced-pollution transportation • Transportation material reuse • Implementation of just-in-time principles • Transportation equipment and vehicle lease
Operations	<ul style="list-style-type: none"> • Production process standardization • Energy-efficient equipment and process use • Waste/pollution reduction • Renewable or “clean” energy use • “Closed-loop” manufacturing • Recycled-content/refurbished equipment
Outbound Logistics	<ul style="list-style-type: none"> • Collocation • Energy-efficient, reduced-pollution transportation • Transportation material reuse • Implementation of just-in-time principles • Transportation equipment and vehicle lease
Marketing and sales	<ul style="list-style-type: none"> • Products designed for the environment (recycled, reusable, durable, biodegradable, nontoxic, energy-efficient, non-polluting, water-saving, sustainable, harvest) • Concentrated products/package volume reduction • Package reuse and refill • Product standardization • Environmental certification or labelling • Public relations programs
Service	<ul style="list-style-type: none"> • Product leasing programs for “take-back” and refurbishing • Refill services • Environmental education for consumers and community • Energy-efficient service equipment and parts
Post-Use Processing	<ul style="list-style-type: none"> • Discarded material sale or reuse • Waste-to-energy cogeneration • Products made for easy disassembly and recyclability (pure materials rather than composites, “snap fits” rather than and screws) • “Closed-loop” recycling systems with suppliers and customers
EVC Support Activities	Enviropreneurial Strategies
Procurement	<ul style="list-style-type: none"> • Implementation of environmental qualification purchasing codes and criteria (recycled content, collocation, closed-loop sourcing, sustainable harvest) • Monitoring of suppliers’ environmental performance • Supplier enviropreneurial education programs

Technology Development	<ul style="list-style-type: none"> • Disassembly and reuse technologies • Total quality environmental management (TQEM) and life-cycle oriented environmental management technologies
Human Resource Management	<ul style="list-style-type: none"> • “Green team” and enviropreneurial incentive programs • Employee enviropreneurial education programs
Corporate Infrastructure	<ul style="list-style-type: none"> • Environmental performance evaluations and audits • Adoption of environmental and social accountability guidelines, such as “CERES principles” (Coalition of Environmentally Responsible Economies) • Socially responsible investment certification • Appointment of visible, top-level environmental executives and director • Participation in public policy and law development

4. Past Research Enviropreneurial Value Chain (EVC) Strategies Implementation

Although the term ‘enviropreneurial’ strategies were use in marketing studies, the concept enviroprenurial were also discussed extensively in supply chain studies such as green supply chain studies, sustainable supply chain studies and others studies related to green context. However, most of the studies only focus on one functional area in a chain and rarely study the concept of green contexts as whole systems.

Nevertheless, there are few studies that consider green practices on the entire supply chain. For example, the study of Rao and Holts (2005) discussed the concept of green initiatives in the supply chain management. Rao and Holts (2005) use relatively similar concept of value chain introduced by Porter (1985) by modeling the environmental initiatives in three phases- inbound; internal processes and; outbound phases. Table 2 shows the comparison between green supply chain and EVC strategies.

Table 2: Comparison between two studies green supply chain and EVC strategies toward green context (Rao & Holt, 2005) (Hartman & Stafford, 1998)

Phases	Strategies	EVC Strategies
Inbound Logistic	<ol style="list-style-type: none"> 1. holding awareness seminars for suppliers and contractors; 2. guiding suppliers to set up their own environmental programs; 3. bringing together suppliers in the same industry to share their know-how and problems; 4. informing suppliers about the benefits of cleaner production and technologies; 5. urging/pressuring suppliers to take environmental actions; and choice of suppliers by environmental criteria. 	<ul style="list-style-type: none"> • Collocation • Energy-efficient, reduced-pollution transportation • Transportation material reuse • Implementation of just-in-time principles • Transportation equipment and vehicle lease
Production or the internal supply chain	<ol style="list-style-type: none"> 1. environmentally-friendly raw materials; 2. substitution of environmentally questionable materials; 3. taking environmental criteria into consideration; 4. environmental design considerations; 5. optimization of process to reduce solid waste and emissions; 6. use of cleaner technology processes to make savings in energy, water, and waste; 7. internal recycling of materials within the production phase; 	<ul style="list-style-type: none"> • Production process standardization • Energy-efficient equipment and process use • Waste/pollution reduction • Renewable or “clean” energy use • “Closed-loop” manufacturing • Recycled-content/refurbished equipment

	8. incorporating environmental total quality management principles such as worker empowerment.	
Outbound Logistic	<ol style="list-style-type: none"> 1. environment-friendly waste management; 2. environmental improvement of packaging; 3. taking back packaging; 4. eco-labeling; 5. recovery of company's end-of-life products; 6. providing consumers with information on environmental friendly products and/or production methods; 7. use of environmentally-friendly transportation. 	<ul style="list-style-type: none"> • Collocation • Energy-efficient, reduced-pollution transportation • Transportation material reuse • Implementation of just-in-time principles • Transportation equipment and vehicle lease

Table 2 shows that green supply chain strategies in inbound logistics by Rao and Holt (2005) focus on training suppliers about environmental which is different than EVC. The reason maybe the company do not have their own transportation to pick up raw material from suppliers and mostly hired contractor to do this job. Production phase shows the similarity between both strategies in order to sustain the environmental consideration. In outbound logistic phase, strategies apply by Rao and Holt (2005) do have in common with EVC strategies that applied in outbound logistic as well as marketing and sales.

5. Conceptual model of the Enviroprenurial Value Chain: an SME's Framework

As stated before, to ensure environmentally beneficial products and services, organizations should establish the environmental initiatives as early as possible, which must begin since the sourcing processing. Nevertheless, in the conventional supply chain, there are three phases of activities which includes (see Figure 3):

- 1) Inbound phases
- 2) Production phases
- 3) Outbound phases

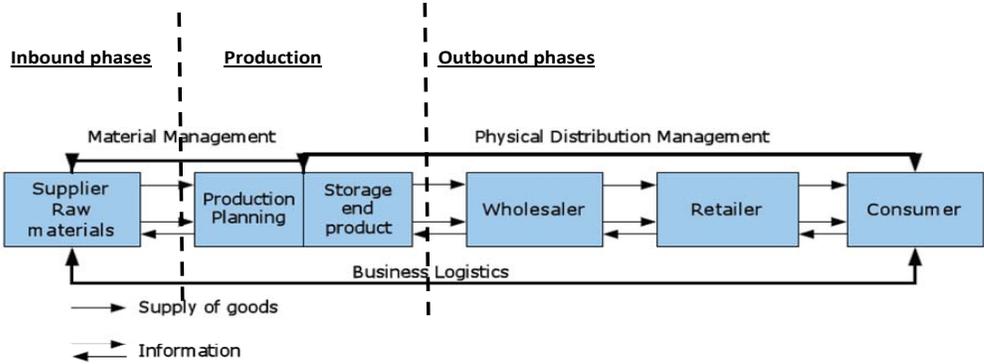


Figure 3: Main activities in supply chain

In the conventional supply chain, interactions of the organisation with customers ends once the customers received their goods and services. Conversely, we postulate that in the environprenurial value chain, the chain must continue and close the conventional loop by adding three additional phases in the chain. Therefore, in this study, the concept of environprenurial value chain encompasses six phases:

- 1) Inbound phases
- 2) Production phases
- 3) Outbound phases
- 4) Marketing/sales
- 5) Services
- 6) Post-use processing

The processes are illustrated in Figure 4.

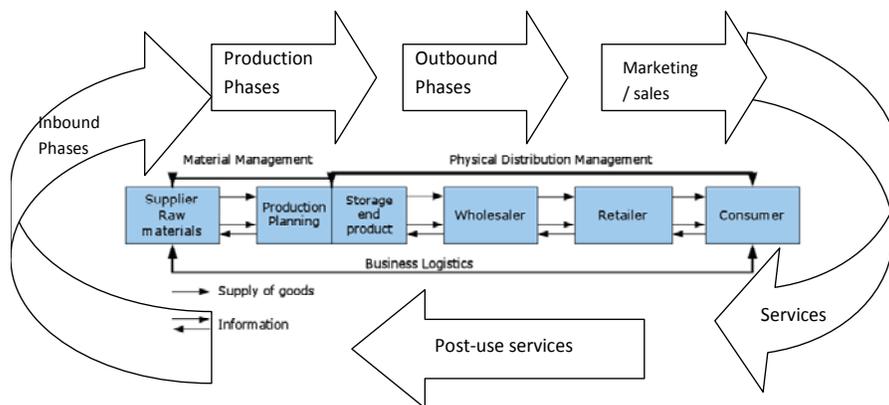


Figure 4: Environprenurial value chain

Inbound phases

Inbound phases in the environprenurial value chain include the process of sourcing of raw materials. The critical issue here is the management of preventive activities such as collocation, energy-efficient and reduced-pollution transportation, JIT principles, transportation equipment and vehicle lease.

Production phases

The second processes are the production phases. In this phase, inputs are transformed into final products forms. Among strategies used are standardization of the production process, usage of energy-efficient equipment and process, reduction of waste or pollution, usage of renewable energy, closed-loop manufacturing and usage of refurbished equipment.

Outbound process

The outbound phases include collecting, storing and physically distribute the products or processes to end customers. The same strategy during inbound phases could be adopted.

Marketing phases

During this phase, the organisation seeks to encourage and provide means for customers to purchase or lease green products. Initiatives of the organisations to reduce environmental foot-print are product designed for the environment. This include producing products that are recyclable, reusable, biodegradable, durable, non-polluting,

nontoxic, energy efficiency, water-saving and sustainable harvest. The marketing phase is also concerns of certification or labelling and reduction of packaging.

Services

Services activities in EVC means to provide services that can enhance or maintain products value. Among activities that organisations can embark on are, product leasing programs for “take-back” and refurbish. Organize a workshop or seminar for the purpose of environmental education for consumers and community. Ensure that employees are always equipped with energy-efficient service equipment and parts.

Post-use processing

During this phase, organisations aim to collect and turn discarded products and waste into inputs materials. The activities include sale or reuse discarded materials, waste-to-energy cogeneration, product design for easy disassembly and recyclability. For example, using pure materials rather than composites; product design that use a concept of “snap fits” rather than screws or glues. “close-loop” recycling systems with suppliers and customers to ensure effortless products or waste collecting process.

The conceptual model design for this study is illustrated in Figure 5.

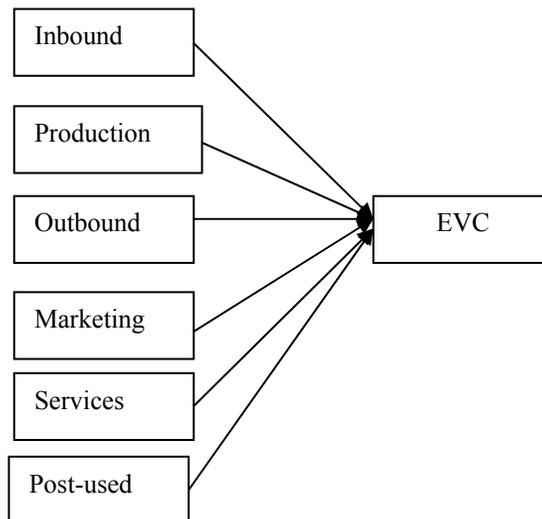


Figure 5: Conceptual Model

6. Conclusion

This paper developed a conceptual model for Malaysian SME’s EVC. Six constructs of EVC is developed in the conceptual model. The notion of the EVC is to close the supply chain loop by integrating environmental practices in the entire phases of the supply network. The EVC is also suggests the principal role of supply partners to enhance knowledge sharing in the supply network. The support from supply partners are needed to ensure SMEs can pursue their environmental strategies and planning successfully (Rasi et al 2010).

Acknowledgements

This research was supported by Malaysian Ministry of Higher Education (MOHE) under Exploratory Research Grant Scheme (ERGS) to the Office of Research, Innovation, Commercialisation and Consultancy (ORRIC) at the Universiti Tun Hussein Onn Malaysia (vot:E044).

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Biography

Raja Zuraidah RM Rasi is a Senior Lecturer of Operations Management at Universiti Tun Hussein Onn Malaysia. She leads a research cluster group in the fields of Production and Operations Management in her faculty. Dr Raja Zuraidah holds a PhD in Industrial Management from Swinburne University of Technology, Melbourne, Australia. Her research interests include sustainable supply chain, sustainability and operations performance. Her more recent work has been on sustainability in supply chain, and improving operations process through concepts such as root cause analysis, critical chains and lean systems. Raja Zuraidah is the corresponding author and can be contacted at zuraida@uthm.edu.my

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