

Supply Chains And Economic Feasibility: A Modern Perspective

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Abstract:

The purpose of this report is to provide a comprehensive and truthful review and prediction of past and future trends in costs, developments, and enhancements to the supply chain and its intersections with sustainability in production.

Background:

Supply Chain Management (SCM) and Demand Chain Management (DCM) are new and prominently occurring terms in business organization that now have been subjected to the need of being environmentally sustainable in nature.

Materials and Methods:

A thorough review of existing research and literature from business academia and publishing was conducted in order to support and provide an effect description of topics discussed in the paper, and to provide justification for predictions and suggestions made in context of improvement of SCM and DCM in a modern corporate landscape.

Results:

Research reviewed concurs with opinions from other researchers in the field, stating that Sustainable SCM (SSCM) implementation would enable profit maximization in firms. Congruence between DCM and SCM was also found to be noteworthy when Sustainable DCM (SDCM) methods are adopted

Conclusion:

Dialogue between the buy-side and sell-side in DCM and SCM chains is of paramount importance to promote operation efficiency, and SSCM implementation would result in economic benefit, and this idea is supported by Pagell and Wu (2009)

Key Words: Supply Chain Management, Demand Chain Management, Sustainability, Sustainable Supply Chain Management, Sustainable Demand Chain Management, economics, economic gain, economic benefit, efficiency.

Date of Submission: 25-12-2023

Date of Acceptance: 05-01-2024

I. Introduction

Supply Chains (SC) and Supply Change Management (SCM) are terms used to describe the processes of designing, making, delivering, and using a product or service (Hugos, 2018). Furthermore, CM Harland (1996) identifies the four main definitions of Supply Chain Management as:

1. The internal supply chain that integrates business functions involved in the flow of materials and information from inbound to outbound ends of the business.
2. The management of dyadic or two-party relationships with immediate suppliers.
3. The management of a chain of businesses including a supplier, a supplier's suppliers, a customer and a customer's customer, and so on.
4. The management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers.

Also notable is the Global Supply Chain Forum's (GSCF) definition of supply chains, stating:

Supply Chain Management is the integration of key business processes from end users through original suppliers that provide products, services, and information that add value for customers and other stakeholders.

When discussing the process of creation and distribution of products, this paper will use a combination of Hugos and CM Harland's first (I) definition. When speaking on inter-business integration and management, the last 3 definitions proposed by Harland shall be considered. When referring to Supply Chain Management as a whole, the GSCF's definition will be used.

Environmental sustainability and unsustainability are terms associated with environmental preservation and corporate social responsibility, and Corbett and Kleindorfer (2003) named their interaction as the next step

from examinations of operations and the environment (phrasing by Linton, J. D., Klassen, R., & Jayaraman, V. (2007)). The definition of sustainability to be used shall be the act of using resources to meet present needs without compromising the ability of future generations to meet their own needs (Dally and Cobb, 1994).

This report will focus on sustainability in recent years as well as modern developments in supply chains separately, and culminate in a discussion of the intersection between sustainability and supply chain management.

II. Supply Chain Management Overview

Supply chain management as a term has risen in popularity greatly, and also in importance. In fact, Lambert and Cooper (2000) described modern business management and competition as “supply chain versus supply chain”, as well as stating that in modern competition business success would depend on supply chain integration, citing Bowersox, D. J (1997), M Christopher (1998) and PF Drucker (1998).

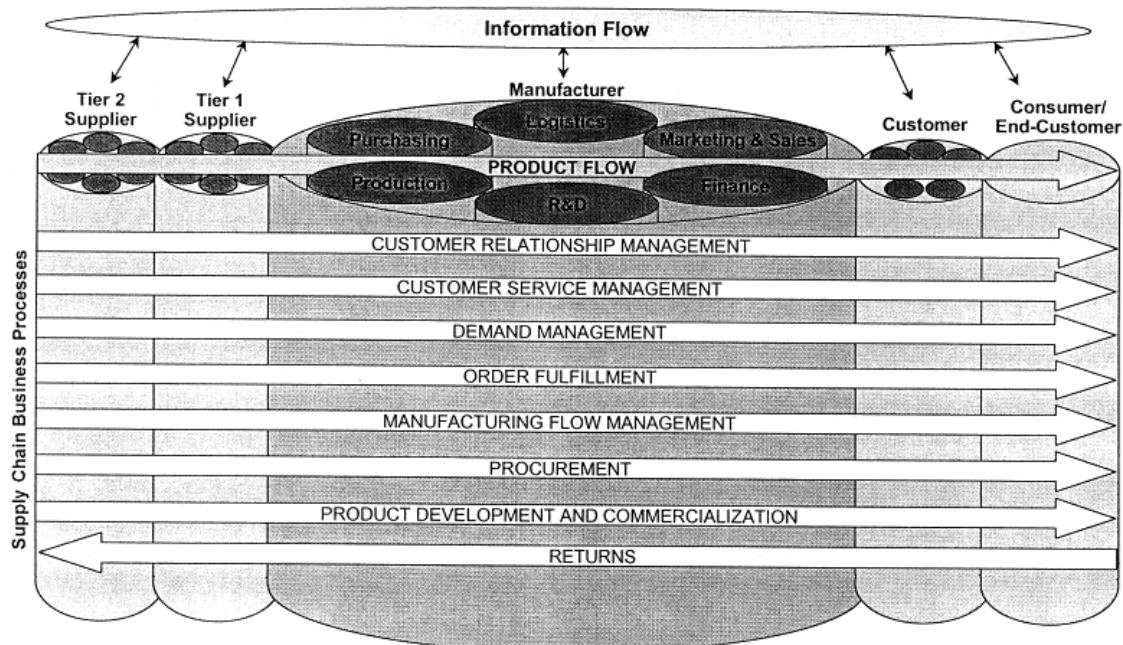


Figure 1: Supply chain management: integrating and managing business processes across the supply chain. From Cooper, Lambert and Pagh (1997).

The diagram here illustrates product development and commercialization, procurement, manufacturing flow management, order fulfillment, demand management, customer service management, and customer relationship management.

III. Product Development and Commercialization

Rogers, Lambert and Knemeyer (2004) define product development and commercialization as the supply chain management process that provides structure for developing and bringing to market new products jointly with customers and suppliers. Therefore, efficiency in the process would be mandatory for reducing wastage, meaning that customer-supplier alignment and integration should be prioritized, a sentiment that would align with both business operations and costs as well as sustainable development as an idea. This idea concurs with prepositions by the World Commission on Environment and Development (1987) where economic growth and sustainable development can occur simultaneously.

The strategic element of the process (Rogers, Lambert and Knemeyer, 2004) is relevant only to determining operations that happen as part of the operational element, and therefore it is key that the sustainability unit of an organization act proactively in planning to ensure that modern strategies employed by business administration follow sustainability guidelines set by authorities or organizations such as the United Nations (UN, UN SDG) or the International Organisation for Sustainable Development (IOSD).

To aid the strategic component, models developed by Carlson and Rafinejad (2008) have been proposed for use, such as the use of a Cost Index that accounts for depletion over a time period “n” with consumption, serving as a guiding benchmark for sustainability in product usage in the manufacturing process.

Other proposed metrics by Carlson and Rafinejad was a Cost of Consumables (COC) that would act to represent the fraction of the product’s selling price as a proportion to the cost of resources in the consumables, and is meant to serve as a figure intended for reduction, as with costs of non-renewable resources increasing, so

would the COC, acting as a warning of rising costs and reducing margins for businesses, promoting sustainable resource adoption.

To finish, product development and commercialization as a supply chain process has a considerable amount of existing research to draw from for improvements to the supply chain process, recalling that the majority of research in sustainable development and business is related to the manufacturing and product creation process. While contextual factors, such as industry size and position of the business may influence the rate of adoption of sustainable factors in manufacturing, policy changes to support and reward implementation through monetary means or otherwise may incentivize faster development and integration in supply chain management.

IV. Demand Management

When discussing Demand Management as a component of the SCM, it should be noted that other researchers such as Gligor (2014) have identified proper demand management and Demand Supply Integration (DSI) as essential to achieving Supply Chain Agility (SCA) and SCM. Gligor also notes that studies by Swafford et al (2006) and Li et al. (2008) assume demand is known at all periods of time, leading to neglect while creating frameworks to support proper SCM.

Studies state that a focus on the operationalisation of the supply from supplier to consumer results in a loss of value created, arising in opportunity costs for the firm as they ignore customer perception of value for the most efficient production of goods (Vural, 2015 citing Jüttner et al., 2007). However, answering this flaw would require the focus on Demand Chain Management, which starts with the consumer and their demands instead of the supplier and resources available.

Demand Change Management (DCM) would be a pull-based strategy that focuses on meeting demand rather than push-based SCM that drives supply to the market. Therefore, a DCM centric approach can be interpreted as producing less wastage in the market as it acts as a reactionary force to demand in the market as opposed to an SCM centric approach which has the capability of surpassing demand in the market with excess supply. However, demand also carries a greater risk of variance, depending on price elasticities and changes in demand that occur at random due to seasonal, population, or political changes.

However, when considering the lack of consumer integration, following Demand Management policies by adopting DCM integration with SCM could also help address problems with Customer Service Management, therefore answering problems with 2 components of the SCM with one approach. Sustainable Demand Chain Management proposes mutual dependency between consumer and firm (Möller and Halinen, 2000) which in turn demands effective communication and maintenance of customer-firm relationships. Following this, a framework for SDCM activities proposed by Vural (2015) can be laid out, where Customer Segment focused SDCM activities would be designed according to environmental, social and economic requirements.

V. Customer Relationship Management

Customer Relationship Management (CRM), in contrast to DCM or SDCM, is a seemingly more nuanced approach focused on helping the consumer achieve more value in a broader sense (Christopher and Payne, 2002). Christopher and Payne also noted increased customer sensitivity to service in the modern day, implying a further importance of strong customer-firm relations in order to maintain competitiveness in the market. Therefore, strong CRM integration or congruence with SSCM is aligned with the interests of the firm.

When focusing on customer relationships, it is important to note the demand-centric approach to be adopted would necessitate a greater importance being placed on SDCM as opposed to SSCM, as pull strategies would better fit the act of maintaining and growing value for products as opposed to push strategies focused on sales.

CRM differs in its more specialized, rather than broad approach to management, as it focuses on carefully targeting customer segments. The company must act as an intermediary between the sell-side and the buy-side of the SCM, and focus on value extraction and maximisation of the service. Value maximisation occurs when the company attempts to create as much value for its customers while simultaneously determining the value it receives from its customers to maintain a balance.

When approached from a sustainability standpoint, CRM must aim to transform its processes to sustainability-related Sustainable CRM (SCRm) processes where the goals of the CRM unit align with sustainability goals. SCRm objectives are split into 5 categories under Lozano (2008), that are the conventional economist's perspective, non-environmental degradation perspective, integrational perspective, the inter-generational perspective, and the holistic perspective.

The processes within SCRm would mean that its roles and duties would be to communicate organisational sustainability concerns with consumers and receive feedback as an intermediary about customer and segment side sustainability concerns, while remaining to maintain a focus on extracting value (Muller, 2014). Business interests would align with economist and holistic perspectives, but may see conflict if sustainable

policies in the operational components of the SSCM such as the Product Development and commercialization system aren't already adopting sustainable practices, as those would interfere with business regard for costs.

VI. Customer Service management

Finally, when discussing Customer Service Management, best described by Bolumole, Knemeyer, & Lambert (2003) as “developing proactive response procedures for addressing specific customer service events, facilitated by the establishment of system infrastructure for implementing effective service solutions”, most important to recognize is the firms requirement to meet a customer or segment's needs in a product or service. While CRM's responsibility is building an effective understanding of a customer and segment's needs, CSM must fulfil requirements set.

Given the nature of CSM, this would mean an independent CSM team would work with several other units in sales, marketing and manufacturing, meaning their involvement would be across both the buy-side and sell-side. CSM teams would have to work on strategic rather than operational ways to manage customer and segment need fulfilment, which, along with Demand Management, would necessitate mutual dependency between firm and customer, and effective communication. Therefore, the CSM must act as a single access point for both information, inquiry and response between customer and firm.

When discussed in a sustainability perspective, the SCSM, or sustainable Customer Service Management chain, would operate in a manner similar to the SCRMM, as it focuses on communication between the firm and consumer by acting as a single access point of information inquiry and response. Therefore, the SCSM's role would be to ensure proper communication of firm and customer discourse over product or service sustainability to ensure adoption and relaying of dialogue regarding concerns.

VII. Order Fulfilment

Order Fulfilment refers to filling, delivering, and servicing customer orders. Order Fulfilment's impact lies with ensuring product availability, which would affect sales and sales growth throughout the year. Optimization and sustainability within order fulfilment would result in lowered costs, aligning with business interests of reduced profit, as well as reduced wastage, aligning with social interests of lower regeneration costs.

Order fulfilment demands the integration of logistics, marketing, finance, purchasing, research and development, production, and coordination with suppliers and firms. This means that this would be an operational unit requiring a larger team in order to ensure effective management of all of its processes. Communication regarding materials and resources between customers and suppliers would be necessary, to avoid wastage concerns, as well as those of ethical concerns, meaning that logistics involvement will have to minimise or nullify errors.

Other areas of sustainability improvement may be in inventory holding- where inventory wastage is kept to a minimum (Troyer et al., 2005). Regeneration may also be a concern for consumers ordering from suppliers, ensuring that materials and resources used would have to align with consumer wants and needs, and as a whole conserving scarce resources for the use of future generations (Putri et al., 2013).

VIII. Conclusions

It is important to consider the business perspective before passing evaluations on decisions made by firms in the Supply Chain Management process that may conflict with Sustainability Guidelines, regulations, and behaviors promoted by organizations such as the UN and IOSD. For example, the evolution of environmental trends and regulations differs by political ideologies that may vary greatly between borders, resulting in insurmountable uncertainty that may lead businesses to act in purely self-interest, which cannot be named irresponsible as much as it should be named prudent and predictable. However, this would support Carter and Rogers (2008) suggestions of companies employing more intensive risk management strategies in an attempt to monitor and make more informed decisions that would align with sustainable development interests.

Therefore, SSCM facets of risk management, transparency, strategy, and culture (Carter and Rogers, 2008) have all been addressed in this report to some detail, between both Supply and Demand Chains. The core concerns of Securing and Mueller (2008) which are pressures and incentives, identifying and measuring the impacts on SSCM, supplier management and managing the supply chain in a sustainable way, additionally, have all been addressed.

However, research also exists wherein SSCM would act as a conflict to traditional business decision making of maximising profitability- Markley and Davis (2007) propositions entail better stakeholder ratings for a firm that employs SSCM, and theory makes logical sense that improvements in communication, delivery, production and management would result in both economic benefit, and if executed while eventually considering the Cost Index proposed by Carlson and Rafinejad, would result in the eventual economic betterment of a firm, as well as their efforts in maintaining a sustainable footprint.

Also notable is the encouragement of transparency within firms- while most release Corporate Social Responsibility (CSR) Reports annually, it is worth mentioning that most firms focus on a supplier focused SSCM, instead ignoring customer collaboration, as reported by Pagell and Wu (2009). Therefore, the support of DCM congruence with SSCM may be worthwhile to consider, noting that congruence between academia proposed SSCM networks and those actually employed by businesses may be more common when SDCM methods of customer relationship management and communication are adopted.

It was continually recognized throughout the report the importance of effective communication- which is operated by the CRM and CSM, that handle inquiries, information and response. It must once more be iterated that dialogue between the buy-side and sell-side is of paramount importance to efficient operation, as it would solve issues relating to miscommunication and would result in near perfect information being communicated, allowing for better decision making to transpire.

References

- [1]. Hugos, M. H. (2018). *Essentials Of Supply Chain Management*. John Wiley & Sons.
- [2]. Harland, C. M. (1996). *Supply Chain Management: Relationships, Chains And Networks*. *British Journal Of Management*, 7, S63-S80.
- [3]. Linton, J. D., Klassen, R., & Jayaraman, V. (2007). *Sustainable Supply Chains: An Introduction*. *Journal Of Operations Management*, 25(6), 1075-1082.
- [4]. Daly, H. E. (1994). *For The Common Good: Redirecting The Economy Toward Community, The Environment, And A Sustainable Future* (No. 73). Beacon Press.
- [5]. Lambert, D. M., & Cooper, M. C. (2000). *Issues In Supply Chain Management*. *Industrial Marketing Management*, 29(1), 65-83.
- [6]. Bowersox, D. J. (1997, October). *Integrated Supply Chain Management: A Strategic Imperative*. In *Council Of Logistics Management 1997 Annual Conference* (Pp. 5-8).
- [7]. Christopher, M. (2017). *Relationships And Alliances Embracing The Era Of Network Competition*. In *Strategic Supply Chain Alignment* (Pp. 286-351). Routledge.
- [8]. Drucker, P. F. (1998). *Management's New Paradigms*. *Forbes Magazine*, 10(2), 98-99.
- [9]. Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1997). *Supply Chain Management: More Than A New Name For Logistics*. *The International Journal Of Logistics Management*, 8(1), 1-14.
- [10]. M. Gligor, D. (2014). *The Role Of Demand Management In Achieving Supply Chain Agility*. *Supply Chain Management: An International Journal*, 19(5/6), 577-591.
- [11]. Swafford, P.M., Ghosh, S. And Murthy, N. (2006), "The Antecedents Of Supply Chain Agility Of A Firm: Scale Development And Model Testing", *Journal Of Operations Management*, Vol. 24 No. 2, Pp. 170-188.
- [12]. Li, X., Chung, C., Goldsby, T.J. And Holsapple, C.W. (2008), "A Unified Model Of Supply Chain Agility: The Work-Design Perspective", *International Journal Of Logistics Management*, Vol. 19 No. 3, Pp. 408-435.