

A theoretical model in higher education: a finite closed loop supply chain

Julio Zavala Umanzor

Universidad Nacional Autónoma de Honduras

zavalajulio@iies-unah.org

Cesar H. Ortega Jiménez

Universidad Nacional Autónoma de Honduras

José Roberto Arrazola

Universidad Nacional Autónoma de Honduras

Abstract

A closed loop in the higher education supply chain consists in the reuse of its results, over and over. This is a circular process that allows to “furbish” (i.e. increase aggregated value of) its input. This recycling behaviour makes up a finite closed supply chain

Keywords: Closed Loop Supply Chain, Higher Education

Introduction

At a time when an issue arises as a major element in the scientific community, in response to the growing challenge that society face to oppose the rational exploitation of resources and globalization, sustainability has become a superlative rise, reaching number issues, and this as a primary axis that allows a management operations to be attuned to the pinnacle of current science. This is the case of closed supply chains (closed loop supply chain), of which we present the significant differences with traditional supply chains and raise this concept reaching beyond tertiary education. Then the adaptation of this topic of operations managements is detailed. From a constructive approach to substantiate a theoretical model of supply chains closed in higher education. This paper take the closed loop supply chain theory, and propose analogies from a supply chain in higher education, through the proposed models in this research area. Since economic definitions until start up production strategies, this paper show how higher education preserve closed loop supply chain

Preliminary

The uses and shortcomings of abstract optimal growth models for analyzing sustainability development are discussed. Optimal growth models can never achieve much realism, but may be useful for clarifying concepts and for making general suggestions for policy in what is a very diverse and complex field. Sustainability may be viewed as a constraint on the conventional optimality criterion of maximizing discounted utility, rather than as a replacement for it. Providing an ethical foundation for sustainability constrains requires that people are seen as having separate preferences for private and social choices. In practice governments may be no more concerned about sustainability than individuals.

Introducción

Recently the concern for sustainable development has generated many research topics about the opening of this issue goes beyond economic definitions and production strategies, before this topic has risen theory of closed supply chains, which are aimed at reducing waste in the production of a product or service

Growing an environmentalist conscience and a marked deterioration of it has generated a growing concern for reuse, the sense of recycling, is a global guideline of using resources as before, but reducing the amount of waste generated, either reuse or remanufacture them.

Literature Review

According to Guide and Van Wassenhove. Essentially, the closed loop supply chain (CLSC) is defined as “the design, control and operation of a system to maximize value creation over the entire life-cycle of a product with dynamic recovery of value from different types and volumes of returns over time” (Guide Jr & Van Wassenhove, 2008). In this sense the main feature of the CLSC lies in maximizing value, even above the cost minimization. The bottlenecks have a deterministic role in the CLSC design, both issues will be discussed.

Furthermore, in CLSC design the cycle time must be considered to be shorter, because, while more belated a product to returned back on the market, the lower the likelihood that there are economically viable reuse options.

This concept of adapting production process models to higher education and his supply chain , in which, students, employers, involved both, in the formation process how a production process and the university planning structure how the plant planning structure. (O'Brien & Deans, 1996). Moreover, a model of supply chain in tertiary education, since a view from the service industry, giving a meaning to customer and providers in higher education, the Integrated Tertiary Education Supply Chain Management (ITESCM) is a model furnishes stakeholders to the sequential process of this services providers, this higher

education process lead a student undergraduate (customer) to be a graduated who is the final product (Habib, 2010).

The ITESCM model presents a set of proposes (Mahbulu Hye, Banik Pathik, Habib Zaman, & Habib, 2014) (Habib & Jungthirapanich, 2009) (Habib M. , 2010):

- The ITESCM preserves the well-being for the end customer, the society.
- The performance on this depends on the seamless coordination of all supply chain.
- Some of the graduates would be added in the service provider as the supplied input
- Graduates were identified as the supplying input in that supply chain
- In this supply chain the students are the raw material
- Finished product are graduates and research outcome

Otherwise, for CLSC it is necessary gauge the value of this product and a right with this property, there is another theoretical model, Higher Education Value and Supply Integrated System (HEVSIS), this model uses aspects from supply chain and value chain, in this form is considering production and operations management, into two main services of higher education, this are teaching and research, and other hand link between stakeholders as an proactive and reactive process (Ortega, Zavala, & Arrazola, 2014).

The HEVSIS examine the value chain is adapted from Porter, and let make a general view over all Higher Education Institution (HEI), since every HEI represent a set of activities (primary and support) that are performance to make the function for was design (Porter, 1985). Finally the value in every HEI result is preserves for their own HEI performance.

The literature review let consider a Higher Education into a supply chain, from now, show how it is possible includes CLSC into the HEVSIS model, which conserve all the propose from ITESCM

Closed Loop Supply Chain

Will be necessary, introduce some criteria for CLSC. First, to understand the reverse logistic character, categorize and define causals for refund into supply chain, this can count as follow (Monroy & Ahumada, 2006):

- During Manufacturing Process: They are internal returns. They may be products that were rejected in the quality control, waste production process, etc.
- During Distribution Process: Son product returns by traders due to defects in the goods, excess inventory, low sales, due dates, obsolescence, etc.
- During Consumption Process: Returns made by customers because their expectations are not met for the product, defective products, warranties, etc.
- During the Post-consumer: Returns to the stage to product use. They are directly made by users or intermediaries as recyclers.

Moreover, the closed supply chains in HE have to preserve all the principal requires from the theory (Beng, 2010). These are:

1. Capture provider /supplier: This process consist in the product acquisition to obtain the new products from the end-users
2. Reinsert: This process involve all these events to recharge the supply chain, which is reverse logistics. This process moves products from the points of use to a point or more points of disposition.
3. Selection supplier/products: To reduce cost, the selection supplier/products make test to determine the product's economically condition.
4. Exploring Feasibility: This process allows establishing constraint to identify the most attractive reuse option.
5. Re-product: This process consists in produce or furbishes the resulting product.
6. Re-marketing: In this process lies to get to the market or create and exploit new one.

Differences between CLSCM and traditional supply chain

The CLSCM focuses on changes in the following five aspects compared to traditional types of supply chain:

Table No 1- Differences between CLSCM and traditional supply chain (Kumar & Kumar, 2013)

Description	SC	CLSC
Main Objective	Lower cost and improve the efficiency	Maximize benefits and minimize waste
Environmental Performance	There not includes an internal management for environmental protection	These includes internal and external management aimed to protect environmental
Business model	Functional for a cycle	Complete Functional, in a whole life cycle
Business Process	The traditional supply chain starts with suppliers and ends with users, and the products flow is one way and irreversible	The closed loop supply chain have a reversible flow
Consumption pattern	Have a consumption pattern ruled by business activities and interest consumer	Promoted by social responsibility corporate and green procurement

Discussion

The adapted into HE context about refund is:

- During Manufacturing Process: They are internal returns. This is a return into a link concerned by offer service (i.e., Higher Education Institution) in HEVSIS, in this particular case they may be that students or projects was rejected in a quality control, waste time and HE process, etc.
- During Distribution Process: Are product returns before insert in labor market, due to defects in the goods, excess offer, obsolescence, etc.
- During Consumption Process: Returns made by customers because their expectations are not met for the result, defective results, etc.
- During the Post-consumer: Returns to the stage to product use. They are directly made by users or intermediaries to furnish.

Some SC into HEVSIS which preserves or can achieve the CLSC state are the relations between:

1. Universities and students who decided take other studies into the universities. (refund by manufacturing process)
2. Graduated students who decided postgraduate studies (refund by Post-consumer process)
3. Graduated who needs some specific capacitation (refund by Consumption process)
4. Graduated who don't insert into labor market (refund by Distribution process)
5. Projects which don't was satisfactory (refund by Consumption process)
6. Projects which resources was insufficient (refund by manufacturing process)
7. Projects which will be replicable (refund by Post-consumer process)
8. Projects which needs some corrections (refund by Distribution process)

On all this cases there is a constant, always its possible aggregate value on their own supply chain and achieve too the requirements for make considerer like CLSC because to star again, all the process of HE are restarted.

Further Research

Finally, there is a criterion for dismissed or break this closed loop, this breaking have a theoretical base. Decrease performance law.

Bibliography

Beng, N. S. (Febrero de 2010). *eprints*. Recuperado el 20 de Enero de 2015, de
<http://eprints.nottingham.ac.uk/12102/1/523160.pdf>

Guide Jr, V. D., & Van Wassenhove, L. N. (2008). *insead.edu*. Recuperado el Enero de 2015, de
<http://www.insead.edu/facultyresearch/research/doc.cfm?did=19631>

- Habib, M. (2010). *INTECH*. Recuperado el agosto de 2014, de
<http://www.intechopen.com/books/management-and-services/an-empirical-research-of-itescm-integrated-tertiary-educational-supply-chain-management-model>
- Habib, M., & Jungthirapanich, C. (2009). Integrated educational management for the Universities. *The Journal of China USA Business Review*, , 25-38.
- Kumar, N. R., & Kumar, R. M. (2013). Closed Loop Supply Chain Management and Reverse Logistics-A Literature Review. *International Journal of Engineering Research and Technology*, 455-468.
- Mahbulu Hye, A. K., Banik Pathik, B., Habib Zaman, M., & Habib, M. M. (2014). Comparative Analysis of Supply Chain Management for Universities through ITESCM Model. *Proceedings of the International Conference on Industrial Engineering and Operations Management* , (págs. 1904-1913). Bali, Indonesia.
- Monroy, N., & Ahumada, M. C. (junio de 2006). *SciELO*. Recuperado el 10 de Enero de 2015, de
http://www.scielo.org.co/scielo.php?pid=S0121-49932006000100003&script=sci_arttext
- O'Brien, E. M., & Deans, K. R. (1996). Educational supply chain: a tool for strategic planning in tertiary education? *Journal of Marketing Practice: Applied Marketing Science* , 33-40.
- Ortega, C., Zavala, J., & Arrazola, J. (2014). Value and supply chain in higher education: an interactive qualitative analysis of chain links. *POMS*. Atlanta .
- Porter, M. (1985). Competitive Advantage, Creating and Sustaining Superior Performance. New York: Free Press.