

Porter's Value Chain" – With Special Reference to Overhaul of Construction Machineries

Col (Dr) Subramanian.R, Dr. Rajeesh Viswanathan, Dr. Jahira Parveen

Abstract:

Purpose:-The present study is descriptive and qualitative in nature aiming to bring out the application of porter's value chain frame work in to construction machineries overhaul sector.

Design / methodology / approach:-It is basically a qualitative study based on secondary data identified through review of literature from journals and books.

Findings:-Porter's value chain has nine generic activities (five primary and four secondary). Activities are grouped into two types of activities oriented to goods output and market. Product oriented activities are the activities, undertaken by the focal firm to add value to the goods produced. Market oriented activities are the activities, undertaken by the focal firm to deliver the end product or services to the users. Support / secondary activities are those activities, not directly associated with the conversion process but aids the principal activities in their execution / functions. This study identified seven primary activities and six secondary activities for construction machineries overhaul sector.

Originality / value:-This article gives valuable outcomes in understanding the porter's value chain frame work and its applications. This article also explains the importance of the primary and secondary activities including the interlinking of activities within the and outside the firm. In spite of the limitations of the research, the study contributed to the application of porter's value chain concept in to construction machineries overhaul sector. The study has found that porter's value chain concept can be applied to other areas.

Index Terms: Value chain model, construction machineries overhaul, primary/principal activities, secondary /supporting activities.

I. INTRODUCTION

The value chain of a firm decides the expenditures involved (costs), thereby making differences in profits. It is a very valid and logical concept useful in investigating the sources to generate valuable or meaningful values of any company. Value chain concentrates on sequences, and the method of converting inputs into outputs/end products brought by users. Michael E Porter (1985) designed his frame work of Value chain and which is being briefed as "a series of connected value gaining activities; goods propel through sequence of activities, attaining value at each level". He first explained

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this particular idea in his book titled as "Competitive Advantage: Creating and Sustaining Superior Performance". This logic of value generation is applied to a firm's supply chain members. It mandates attaining benefits for all activities which are being performed over the product/service from its inception till the product is being out dated .The said value chain can be used to verify all of their activities and to look at the way they're linked. Porter (1980) developed value chain method & strategies which are being used to know the growth of the firm on comparing with its rivalries. The value chain is a network of individual activities. These activities develop products or desired output, there by generating value for the firm.

Based on Porter's frame work , Ching Chyi Lee & Jie Yang (2000) designed a knowledge based value chain concept. Vorster (2001) designed such frame work to deal with mining. In similar way Van der Merwe & Cronje (2004) developed framework for education. Gabriel (2005) pointed out that the factors like incoming and outgoing logistics are not part of education sector. Ilyas et al. (2005) located the main dimensions of value chain frame work for information technology based companies by using Interpretive Structural Modeling (ISM) tool. A decision implemented by the firm has implications over its competitive status and profits. Strategic planning aids in making such valuable decisions. It is being carried out to aid the firm to catch a place for itself amongst its rivalries in attaining the competitive gain . Porter believes that value chain analysis is a best suited method for designing strategy. These tool s can be used to design competitive strategies, to locate the method of gaining competitive advantage, and identify and /or know the connections and interrelationships between activities that generate value.

Competitive strategies (business strategies) are derived from integrating/interlinking activities in the value chain. To have better understanding, there is a clear interconnection between R&D, production, marketing, and information systems of a firm. Due to many connections and interconnections among activities, the capacity to control the interrelationships is very important in realizing competitive advantage. Integration increases a firm's ability to design strategies, e.g., respond speedily and effectively to situational changes, better reaction to users requirements, and manage finance. Competitive strategies concentrates on happenings required to enhance the value of goods. According to Porter, a dynamic environment which has intense competition, companies are required to control the distribution of activities amongst organizational sub-units to ensure survival. Users requirements and market situations may demand



that control above the integration between the classical departments, product lines, or geographical lines. A company may need to design strategies and control interconnections within the same department/activity amongst different units, e.g., amongst business firms and across border firms. For example ; a model sold in the England may be designed in Sweden, assembled in Spain with parts from china ,Japan, Korea ,Singapore, and India , and have advertising designed in Mexico. This laymen and small example which seems as logic does not quantify the gravity to which the process is a network of collaborations.

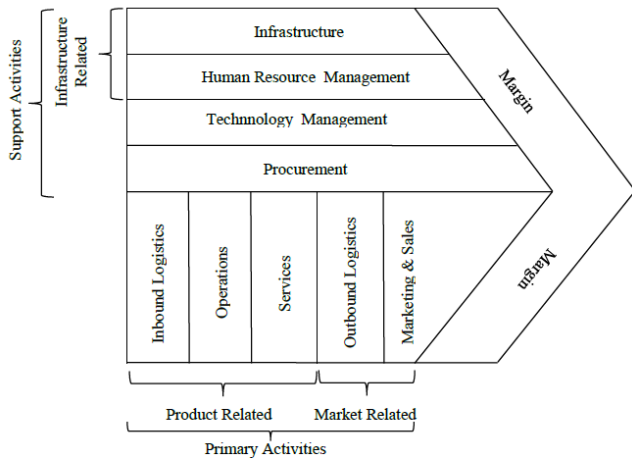


Figure-1: Porter's Generic Value Chain. Source: Porter (1985)

II. STATEMENT OF PROBLEM

Less amount of studies were carried out in respect of framing value chain model for construction machineries overhaul domain. In view of this, the value chain model for the same was developed.

III. REVIEW OF LITERATURE

Value chain analysis finds practical applications; can be applied to derive competitive strategies, know the origin(s) of competitive advantage, locate and/or achieve the connections and interconnections amongst activities that ensure value. Porter argues that value chain methodology can be a helpful in framing strategy(Ensign,2001).Value chains are actual linkages or interconnections of businesses that can ensure cost control , gain market response in terms of efficiencies, satisfy customer requirements, and lastly realize beneficial financial results and better competitive status for the firms part of the value chain relationship (Michael Haines, 2005).The idea of value chain was initiated by Harvard professor Michael Porter in his book titled as 'The Competitive Advantage' in 1985 (Porter, 1985). He explained that activities carried out inside the firm adds value to the service and products that the firm gives out , and all these activities should be performed at optimum level if the firm has to realize competitive advantage. These value developing activities consists of all items to include logistics both incoming and outgoing production, marketing and sales, and service. Michael Porter also recommends that the firm's activities are grouped into 'primary activities' and 'support or secondary activities'(Hongni zhang,2010).

The innovative concept called as Value Chain concept was worked out and advertised during 1985 by Michael Porter, in "Competitive Advantage," a constructive work on realization of competitive strategy to generate better business performance including profits. Porter argued value as the amount of money customers / buyers want to pay in return for what a seller gives , and he designed the "value chain" as the sum of nine generic value added activities generated by a firm – activities that are linked together to provide value to customers. Porter interconnected the value chains amongst firms to generate what he described a Value System; however, in the present environment of highly outsourcing and collaboration, the interconnections between many firms value adding processes have been generally addressed as "value chain." As this logic conveys, the primary/main aim in value chains is on the positive gains that are favorable to buyers , the interconnected activities that develop value, and the resulting demand and finance flows that are being realized . Effective value chains results in better financial results (Andrew feller et al.2006).

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Gabriel (2006) realized a value chain method personalized for services. Ilyas et al. (2006) initiated a frame work to study the linkage between the value chain members. Rijejan Landry et al. (2006) designed knowledge value chain method to translate the knowledge in health organizations. Ilyas et al.(2007) researched the relative efficiency of value chain relationships in the Indian Steel Industry by using Data Envelopment Analysis (DEA). Ruskov & Ruskov (2007) gave insights in to modeling educational processes as a value added chain. Ilyas et al. (2008) tested a frame work which used ISM regarding outsourcing the value chain activities effectively. Makkar et al. (2008) have developed modified value chain frame work for higher education domain. Tamara Almarabeh et al. (2009) initiated "knowledge value chain (KVC)" model to be used on the firms in knowledge management field. Pathak & Pathak (2010) developed a rearranged higher education value chain by redefining the value generation for higher education. Peter H. Antoniou et al. (2011) delivered a model with some items for investigating the value chains. Chien-Liang Kuo et al. (2011) have applied the concepts of value chain and value co-creation in designing a methodical approach for service trade mode selection. Claudine Soosay et al. (2012) designed a frame work using Sustainable Value Chain Analysis (SVCA) for locating segments for development. Leopoldo Laborda Castillo and Daniel Sotelsek Salem (2012) developed various techniques using DEA tool for verifying the efficiency of value chains.

Anni-Kaisa Kahkonen & Katrina Lintukangas (2012) carried out a study on role of supply chain in value



generation of a firm. Seyed Mohammad Adeli et al. (2012) proposed charity value chain. The method is much similar to Gabriel's (2006) recommended service chain frame work. Mahsa Dorri et al. (2012) reviewed their earlier studies on value chain in higher education segment and examined the results. Vesa Karvonen et al. (2012) developed a tuned value chain method for a research institute. Rupa Rathee et al. (2013) analyzed and studied different models of value chain in higher education proposed by earlier research scholars. Abid Sultan & Dr.Saurabh (2013) proposed different drivers along the value chain of a focal firm for attaining sustainable development. Daiva Rapcevicience (2014) identified a value chain model for public sector service. V.V. Devi Prasad Kotni (2014) delivered methods for fresh fish value chain and cost effective value chain for fresh fish (Acharyulu et al.2015).

follows:-

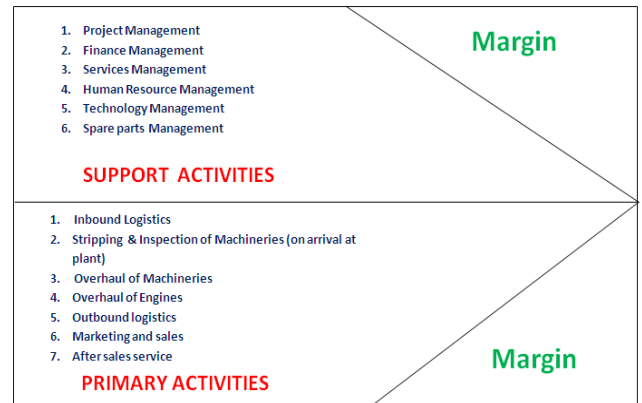


FIG-2:VALUE CHAIN MODEL FOR OVERHAUL OF CONSTRUCTION MACHINERIES

IV. VALUE CHAIN MODEL FOR CONSTRUCTION MACHINERIES OVERHAUL SECTOR (CONCEPTUAL MODEL)

The construction machineries include road rollers, dozers, trucks, motor grader, hot mix plants, concrete mixtures, stone crushers, excavators, rock drilling machines...etc. The overhaul (OH) of vehicles/equipments/plants (V/E/P) is undertaken to achieve more life out of them. The deciding factor for overhaul (OH) is based on mileage/hours run by V/E/P. The deciding factor is anticipated based on the assumption that a particular vehicle will run for some pre decided kilometers or hours per month from the date of induction in to service.

The life may be expressed in hours or kilometers depending upon the type of machinery. This is also called as mid life overhaul. This overhaul is carried out when the machine completes 50 – 60 % of original life. For example, the life expected out of a truck is 10,00,00 Kms, then the truck will undergo OH, when it completes the mileage around 60,000 Kms.

Vehicles/equipments/plants (V/E/P) on arrival at OH plant will undergo inspection and it will be parked at the vehicle bay for storage . In the vehicle bay the engine will be removed from the machine and goes to the engine bay for storage. Thereafter as per production schedule V/E/P will be taken out for OH. The main production (OH) units are truck-chassis OH section, construction machinery-chassis OH section and engines OH section. Over and above these main production (OH) units, there are some sub units like fuel injection pump (FIP) section, battery section, electrical section, seat repair section, body repair section, cabin repair section, tire- tube section, welding section, hydraulic section, painting section, engine testing section and V/E/P on road test section (after OH) ...etc. The value chain frame work advocated by Porter with five primary activities and four supporting activities as described above can be used as a generic one and cannot be used directly in overhaul sector due to the nature of work. Hence, a different version of the value chain for OH of V/E/P is developed with seven primary activities and six secondary activities. The shape of the Value Chain for construction machineries OH will be the same as that of Porter but the difference is in some of the activities and their application. The conceptual model of value chain is shown in Fig-2 as

V. DISCUSSION

Value Chain – Principal/Primary Activities

Primary activities are the one which are directly responsible for completing the OH. They are divided into two group of activities related to goods and market. Product oriented activities are the activities, undertaken by the focal firm to add value to the goods manufactured. Market oriented activities are the activities, undertaken by the firm to deliver the end/ final product or services to the users.

Incoming Logistics

These include the receipt of V/E/P which are required to undergo OH from customers.

Stripping and inspection

These include dismantling of V/E/P and handing over assemblies to respective sections to undertake necessary activities to complete the OH. The inspection is very important since it will decide which part needs repair / complete replacement. This forms the basis for procurement of spare parts and other required items including lubricants.

Overhaul Operations

Respective sections on completing overhaul of main assemblies/sub assemblies, hand over it to concerned chassis OH section / engine OH section to complete the OH. The chassis OH section will deliver the final output. It requires a strong coordination amongst chassis OH section and sub sections. More over manufacturing of spares and components to meet the internal requirements; undertaking the major repairs of equipments of firm; vibration and condition monitoring of equipments; etc....

Outgoing Logistics

These include planning and delivering of overhauled machineries to reach end users.

Marketing and Sales

These include product management; price management; delivery management; promotion management; customer relations management etc.

Service after sales

These include concluding contact; installation and commissioning; warranty clause repairs; complaint addressing mechanism.



Value Chain - Support activities

Support activities are those activities, not directly responsible for the OH process but aid the principal activities in their functions. These activities are divided as:

Spare parts Management

Vendor Development

This contains registration; categorization; performance rating & supervising.

Purchase

Contains locating sources for different spare parts ; selection of suppliers; taking requirements from various sections (indents); processing of indents; procurement of spare parts, raw materials for making certain spares , expendables , stationery... etc.

Stores

These include acceptance of raw materials, spares & consumables; custody of spares and Consumables; stock control; issue of spares & consumables to various departments; disposal of non-moving spares & expendables; inventory control..etc.

Technology Development

These include quality assurance and technology development; research and development; processes development.. etc.

Human Resource Management

These include manpower planning, training, recruitment, rules & policies, welfare; industrial relations, awards, incentive schemes; Medical; Administration (general administration, law), Human Resources Development...etc.

Services Management

These include management & maintenance of unit machines, power pack upetc.

Finance Management

These include budgeting, paying employees, paying related bills...etc..

Projects Management

These include the technical activities of OH plant, managing overflow and monitoring of future requirements.

Value Chain - Margin

The OH plant consumes some amount of money for generating value for its final products/services. The margin is the difference between the sum of all the values produced at the activities in the value chain and the total cost consumed by the firm to generate such values.

VI. CONCLUSION

The generic value chain developed by Porter is a very logical and important practical tool, generally for manufacturing industries but not in all cases in the value systems of other areas. However it can be used as a guiding tool for framing the value chains for other sectors. Hence a value chain model for construction machineries OH sector is designed with seven primary activities and six supporting activities and explained in this article. This study can be applied to construction machineries OH sector for better value addition..

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