

Study on Value Chain Analysis of X-Ray Machine

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Abstract

Value Chain Analysis is one of the way for identifying which activities are best undertaken by a business and which are best provided by others. Value Chain Analysis includes Inbound logistics, Operations, Sales , Marketing, and Service. The demand for digital x-ray services in India is growing up and supply by x-ray services has grown steadily and private sector becomes more involved owning and running x-ray services. There is no substitute for x-ray services particularly for small service industries unless they reduce the cost in various activities by planning.

Key Words: Value chain analysis, logistics, service industries.

1. Introduction

An introduction on X-ray for non-destructive testing with its applications in a wide range of industries. A great variety of X-ray equipment currently available offers a comprehensive range of penetrating power that can satisfy virtually any requirement, be it permanent installation or an in-the-field application. These applications can range from irradiation studies, micro miniature electronic circuitry and light-alloy casting inspection, right through to the inspection of welded seams and heavy steel structures more than 100 mm thick. Services represent a part of Business output and investments to provide the Information Technology to facilitate their services, represent a substantial portion of corporate spending. The purposes of any Investments for providing services are to create business value. In order to any Investment, a positive impact on business value, additional revenues need to be created or overall cost to be reduced, then the evaluating Investment for potential contribution to the improvements in business performance. The interaction of costs among the various business process and activities need to be considered. Hence, an understanding of Value Chain Analysis becomes essential.

2. Objectives of the Study

This study is aimed to analyze the Value Chain Cost of the organization, the trend of the organization, Cost Ratio of the organization, Cost-effectiveness of the organization.

3. Methodology

The data collected is the related secondary data, is obtained through Administration reports, information from journal, magazines, website, and other reference books.

The analysis is done with the Michael Porter Value Chain Model and tools like Regression analysis, Trend Analysis, Cost ratio and Cost Benefit Analysis are used

4. Data Analysis and Interpretation

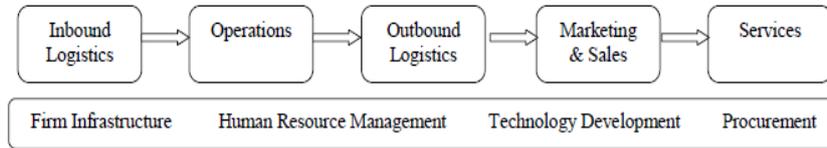
Data collected through Secondary sources of company's Financial Reports, Cost sheets, etc.

Value Chain Analysis

The value chain is a concept from business management that was first described and popularized by Michael Porter in his 1985 best-seller, *Competitive Advantage: Creating and Sustaining Superior Performance*. Value Chain Analysis is a powerful tool for managers to identify the key activity within the firm which form the value chain for the organization and have competitive advantage for the company. Thus competitive advantage of the organization

performs better activities than the competitors. The main purpose of any Investments for providing services is to create business value. The interaction of costs among the various business processes and activities need to be considered.

Michael Porter Value Chain Model



Value Chain Analysis describes the activities that take place in a business and relates them to an analysis of the competitive strength of the business. Influential work by Michael Porter suggested that the activities of a business could be grouped under two headings:

Primary Activities - The activities which are directly concerned with creating and delivering a product (e.g. component assembly).

- **Inbound logistics** includes receiving and inventorying of materials.
- **Operations** refer to transform resources and outbound logistics to the Customer on services need.
- **Sales and marketing** precede the operations or even the inbound logistics, rather than following the outbound logistics.

Support Activities –All the support activities require to facilitate the primary value chain activities.

Value Chain Cost of the Organization

The following table shows the Value Chain Cost of the organization, the cost activities of the concerns is divided into Primary Activities are shown below

Cost Components of Primary Activities and Secondary Activities (Rs in Lakhs)

Activities/Months	June-Aug	Inc/Dec %	Aug-Oct	Inc/Dec %	Oct-Dec	Inc/Dec %	Dec-Feb	Inc/Dec %
PRIMARY ACTIVITIES								
INBOUND LOGISTICS								
Receiving Spare Parts Cost	0.30	-	0.34	13.3	0.45	32.35	0.48	6.67
Handling Inventory Cost	0.05	-	0.065	30	0.07	15.3	0.13	85.71
OPERATIONS								
Processing Customer Orders	0.14	-	0.18	28.57	0.19	5.55	0.26	36.8
Customs Duty Paid	0.15	-	0.19	26.67	0.20	5.26	0.22	10
OUTBOUND LOGISTICS								
Inspection and Testing	0.02	-	0.05	150	0.08	60	0.10	25
Delivery to Customer	0.10	-	0.12	20	0.14	16.67	0.18	28.57
SERVICES								
Marketing Services	0.045	-	0.044	-2.2	0.054	22.72	0.066	22.22
Performing Repairs	0.10	-	0.11	10	0.13	18.18	0.16	23.07

The above table shows cost components for primary activities and secondary activities.

In Inbound Logistics, Receiving spare Parts cost decreased from (13.3%) to (6.67%) during Jun 2012 - Feb 2013. Handling inventory cost increased from (30%) to (85.71%) during the study period. This is due to receiving bulk order and storing.

In Operations, processing customer order cost increased from (28.57%) to (36.8%) during Jun 2012 - Feb 2013. Customs duty paid has reduced from (26.67%) to (10%) during the study period. This is due to focusing orders within the country.

In Outbound Logistics, Inspection and Testing decreased from (150%) to (25%) during Jun 2012 - Feb 2013. Delivery to Customer increased from (20%) to (28.57%) during the study period. This is due to efficient performance in delivering the products.

In Services, Marketing Services increased from (-2.2%) to (22.22%) during Jun 2012 - Feb 2013. Performing Repairs increased from (10%) to (23%) during the study period. This is due to receiving the service orders.

Activities/Months	Jun 2012	Feb 2013	Inc/Dec (In %)
<u>PRIMARY ACTIVITIES</u>			
INBOUND LOGISTICS			
Receiving Spare Parts Cost	0.30	0.48	60
Handling Inventory Cost	0.05	0.13	160
OPERATIONS			
Processing Customer Orders	0.14	0.26	85.71
Customs Duty Paid	0.15	0.22	46.67
OUTBOUND LOGISTICS			
Inspection and Testing	0.02	0.10	400
Delivery to Customer	0.10	0.18	80
SERVICES			
Marketing Services	0.045	0.066	46.67
Performing Repairs	0.10	0.16	60

The Above table shows that inspection and testing (Clinical R&D) (26%) obtain the highest value cost in the value chain indicator followed by Administering Financial Operations (16%), Handling Inventory (10%), Managing Human Resources (9%), Managing Technology Resources (8%), Processing Customer order (6%), Delivery to Customer (5%), Receiving spare Parts and Performing Repairs (4%) and others (3%).

Variable Cost	Percentage	Value Added Cost	Percentage	Investment Cost	Percentage	Extras	Percentage
Receiving Spare Parts	60	Customs Duty Paid	46.67	Product Procurement	44.86	Marketing Services	46.67
Processing Customer Orders	85.71	Inspection and Testing	400	General Business Management	48.89		
Delivery to Customer	80	Handling Inventory	160	Managing Technology Resources (R&D)	120		
		Performing Repairs	60	Administering Financial Operations	246.67		
				Managing Human Resources	140		

The above table reveals the Distribution of various Costs incurred by Karma Innovations and Solution during the period of study. Such as

- Variable Cost
- Value Added Cost
- Investment Cost
- Extras

Value Chain Cost Analysis

The value chain cost analysis is made using the following ratio. The ratios used are

- Operating Cost Ratio
- Selling Expenses Ratio
- Administrative Expenses

Operating Cost Ratio

Operating Ratio = [(Cost of goods sold + Operating expenses) / Net sales] × 100
Operating Cost Ratio (Rs in Lakhs)

Months	Operating Cost	Sales	Operating Cost Ratio
Jun-Aug	2.12	8.3	25.54
Aug-Oct	0.19	7.8	2.43
Oct-Dec	2.17	9.09	23.8
Dec-Feb	2.63	11.52	22.8
		Average Ratio	18.6

The above table indicates the OCR which has decreased from (25.54%) to (22.8%) during the period of study. The average Ratio of Operating cost Ratio is (18.6%).

Expenses ratios

Expense ratios are calculated by dividing each item of expenses or group of expense with the net sales to analyze the cost of expenses on total sales.

Selling Expenses Ratio

$$\text{Selling Expenses Ratio} = (\text{Selling expenses} / \text{Net sales}) \times 100$$

Selling Expenses Ratio (Rs in Lakhs)

Months	Selling Expense	Sales	Ratio
Jun-Aug	0.45	8.3	5.4
Aug-Oct	0.43	7.8	5.5
Oct-Dec	0.39	9.09	4.2
Dec-Feb	0.55	11.52	4.7
		Average Ratio	4.95

The above table indicates the Selling Expenses Ratio which has decreased from (5.4%) to (4.7%) during the period of study. The average Ratio of Selling Expenses Ratio is (4.95%).

Administrative Expenses

$$\text{Administrative Expenses Ratio} = (\text{Administrative expenses} / \text{Net sales}) \times 100$$

Months	Administrative Expense	Sales	Ratio
Jun-Aug	1.06	8.3	12.77
Aug-Oct	3.04	7.8	38.97
Oct-Dec	1.22	9.09	13.42
Dec-Feb	1.49	11.52	12.93
		Average Ratio	19.52

5. Findings

In Value Chain Analysis, Inbound logistics, Processing customer orders, Handling inventory have increased and Customs duty paid, Receiving spare Parts have decreased. From Outbound Logistics, Inspection and Testing Delivery to Customer have increased. From value cost analysis, inspection and testing have obtained highest value cost in the value chain indicator. From distribution of costs in value chain Value Added Cost has obtained the highest value followed by Fixed Investments Variable Cost.

In Regression Analysis, the Sales grew is at a positive linear growth rate. From the average level of gross, profit stands positive for all the periods indicating the better performance of the company. From the trend percentage, the ratios of gross sales have wide fluctuations during study period. The average level of gross profits to working fund the ratio of stands stable for the entire study period. In Value Chain Ratios, the Operating Cost Ratio is inferred that it has decreased from during the period of study. From the Selling Expenses Ratio, it is inferred that it has decreased during the period of study. From the Administrative Expenses Ratio, it is inferred that it varies during the period of study.

6. Recommendations

The clinical R and D activity cost is the highest cost in the value chain analysis so the organization can take steps for promoting the sales so that they can attain a competitive advantage in the medical equipment industry. Periodical verification on the movement of products can be ensured so that the non moving items can be identified and suitable action can be taken. The purchase department can consistently increase the purchases of products in bulk so that the demands can be met properly. Direct sales agents can be educated properly to acquire more business proposals of the hospitals and private healthcare centers. Procuring sufficient spare parts for their product service in order to meet the customers' expectations timely. The infrastructure facilities for stocking the goods can be improved. The company can forecast the future demand for inventories and spare parts in order to reduce wastages.

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