

Measuring Disruptive Innovation with Activity Based Costing

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ABSTRACT

With the changing landscape of global competitive environment, it's at most important for business houses to innovate. India has recently witnessed series of disruptive innovations in Financial Domain from demonetization to introduction of GST. These circumstances demand innovative approach. Be it innovation in production techniques, managing customers, logistics management, new product development or business models.

Disruptive innovations give rise to threats and opportunities. To study the impact of threats or measure the extent of benefits, from innovations, in-depth cost benefit analysis is a must. Thus, we see that accurate determination of costs is the base on which successful ideas can be built on. Traditional costing system helps cost control by identifying, classifying and ascertaining product / service cost. Massive variation in product volume, size, complexity, material required, and machine set up time leads to under / over absorption of indirect cost. Activity Based Costing technique has been developed to overcome these challenges. This paper will help you to understand the concept of Activity Based Costing, identify the differences between Activity Based Costing and the Traditional Costing Methods and benefits derived from Activity Based Costing.

Activity Based Costing system is designed considering firm's activities. Once cost of executing the activities is captured, and homogeneous cost pools are formed, selecting appropriate activity measure for each pool does the trick of allocating costs to the respective products.

Understanding accurate costs helps management in determining product mix and profit planning decisions. Usage of Activity Based Costing enhances manager's ability in taking befitting decisions leading to successful disruptive innovation.

Keywords: under /over absorption of indirect costs, activities, activity drivers, cost pools, product mix, profit planning,

I. INTRODUCTION

Global competition, changing business environment and technological advancement fuels business model innovation. Innovation can be sustained innovation or disruptive innovation. Measuring success of disruptive innovation is more challenging using traditional costing approach.

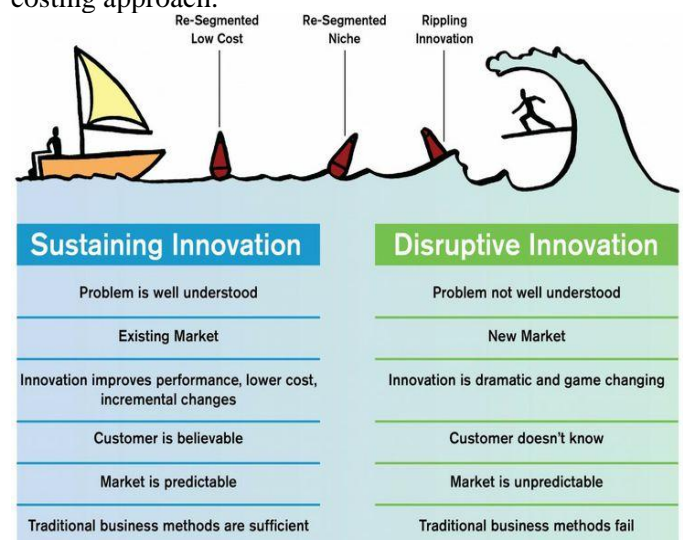


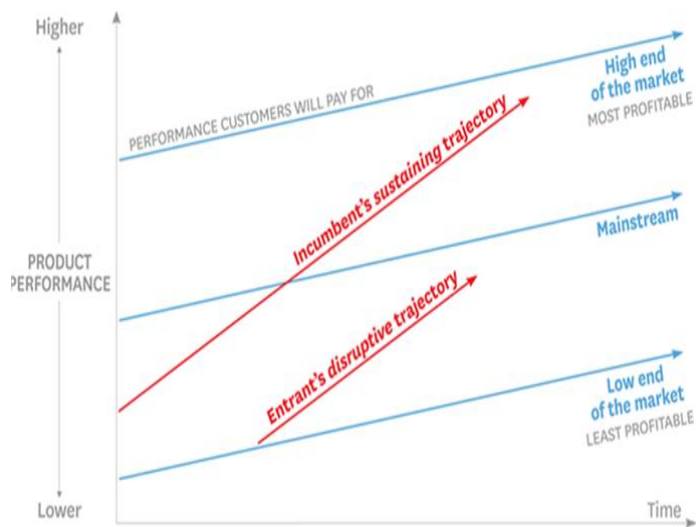
Fig 1

A disruptive innovator has to qualify few conditions, as per the theory of disruptive innovation explained by Harvard Business School professor Clayton Christensen:

- i. An entrepreneur/player has to come up with something new in the market that was not thought off previously.
- ii. The product/s can be a new product/s (or service/s) or an improvement in the existing product/s (or service/s).
- iii. This introduction should be targeted to the market segments who are not tapped or ignored so far.
- iv . The new product/s (or service/s) should necessarily be introduced at low cost.

1.1 The Disruptive Innovation Model

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Fig 2

Above diagram indicates the path undertaken by the new player to enter into the existing market for untapped customers. The player rises into the mainstream, as it starts performing as per the expectations of the conventional customers. During this developing phase, the player needs up to date information about the cost of the new product /service. Traditional costing enables the costing of products undoubtedly. But when the cost structure consists of indirect costs in larger proportion, it fails to give the accurate costing of products/services. And this is the area where Activity Based Costing provides the desired solution.

II. OBJECTIVE

The study is conducted to fulfill the following objectives:

- ✓ To understand the concept of disruptive innovation.
- ✓ To study the concept of Activity Based Costing.
- ✓ To identify the variation in costing with Activity Based Costing and Traditional Costing Methods.
- ✓ To come up with advantages of Activity Based Costing.

III. RESEARCH METHODOLOGY

The paper is based on secondary data. The researcher has referred to various reference books, Harvard Business Reviews & articles and various journals like Decision, Journal of Accounting Research, and Agricultural Economics Research Review etc.

IV. LITERATURE REVIEW

4.1 Role of Costing in decision making

Costing, as a discipline is well known to provide valuable information to the management of any organization for decision making purpose. Different methods of costing such as job costing, process costing etc. are used in different industries depending upon the nature of business and production activities. These are committed for the purpose of cost ascertainment and profit determination. On the other hand, for the purpose of controlling the costs, the techniques that were used by business organizations are absorption costing, standard costing, marginal costing etc.

For the successful launching and implementation of the costing system in any business organization the most important, inevitable and core prerequisites would be cost ascertainment and cost control .Once decided and accepted, the costing system to maintain its efficiency and effectiveness will be using above mentioned techniques and /or methods. And these methods and techniques of costing are built on the basic concept of classification of cost. Costs could be classified:

- ✓ On the basis of functional classification: we have production cost, administration cost, selling and distribution cost and research and development cost.
- ✓ On the basis of controllability: we have uncontrollable and uncontrollable cost
- ✓ On the basis of normality: we have abnormal and normal cost
- ✓ On the basis of variability we have: fixed, variable and semi-variable cost

Apart from the above mentioned classifications, another most important classification for the purpose of ascertainment of correct costs is the one based on identifiability to the products i.e. direct and indirect

costs. Combination of all direct costs = **Prime cost** and Combination of indirect costs = **Overheads**
 These overheads are given distinct accounting treatment and are equally important in the managerial decision making process. In order to include them in the product or service costs; they undergo the process of cost allocation, cost apportionment and cost absorption to the respective cost centers and the cost units.

4.2 Prerequisites for a successful costing system

Hence, it can be concluded that, in order that a costing system is successful in achieving its objectives of cost ascertainment and cost control, the prerequisites would be:

- ✓ A purposeful breakdown of costs leading to meaningful classification
- ✓ Apportionment of costs with precision and
- ✓ Accurate absorption to the cost centers or cost units.

The above mentioned traditional techniques of costing like standard costing, marginal costing, absorption costing have their own advantages and drawbacks in their application and use in the managerial decision making process.

4.3 Problems with the traditional costing systems

- ✓ product cost distortions and
- ✓ Identifying and relating administrative, marketing and distribution costs to product inventories.

Cost distortions that might arise under Traditional Cost Systems are :

1. Diversity on account of difference in volume of products produced: Products that are newly introduced or introduced with new features are likely to be low in volume in the initial stages of production cycle. Hence, there are chances that they are under-costed.
2. Diversity on account of difference in sizes of products: Products that are smaller in size could be under-costed.
3. Diversity on account of difference in complexity of product design: Products with complex design can be under-costed.
4. Diversity on account of difference in materials consumed by products: Products that consume unique or many parts can be under-costed.

5. Diversity on account of difference in number of machine setups required: Products that require more number of machine set ups or long or complex machine set ups could be under-costed.

4.4 Evolution of Activity-Based Costing

Emphasizing on the drawbacks of traditional costing systems in the allocation of overhead costs Cooper(1988a) introduced the utility of activity-based costing system.

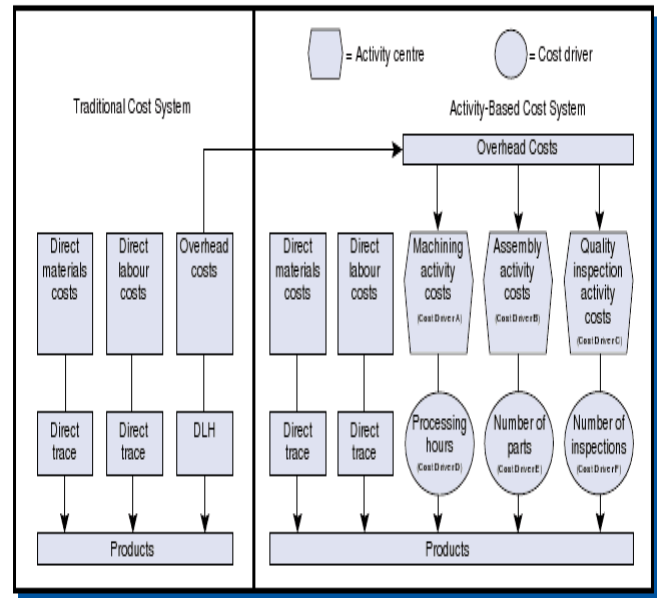


Fig 3: Activity Based Costing Vs. Traditional Cost System

Thus Activity Based Costing, costs are traced on the basis of relevant **activity volume**, rather than exclusively using allocation bases related to the volume of the products or services produced. Applying this logic, ABC provides the solutions to the problems arising under traditional cost methods.

4.5 Acceptance Of Activity Based Costing

After 1990s activity-based costing has received noticeable recognition in India. In India the percentage of respondents that are using activity-based costing system as supplementary/offline is 20.75% and 28.30% of the respondents have integrated it with ERP systems.

The adoption rate for ABC was nearly 38% in India in 1999, 26% in the USA, 20% in the UK and 40% in Norway(Business Today, 1999; Innes and Mitchell,

1995; Innes, et. al., 2000; Ittner et.al.,2001; and Bjemenak, 1997).In the manufacturing sector there were 76.92% ABCM user firms and 23.08% in the service sector.

Firms (In Manufacturing & Service Industry) Benefitted From Activity Based Costing Implementation:

Organization :- L G Electronics

Products - Flat Screen Televisions & mobile phones

Benefits Derived-

ABC analysis of company's procurement system revealed that:

- ✓ Maximum resources of the company were applied to administrative tasks and not strategic tasks.
- ✓ The administrative tasks were accomplished manually at a very high cost.

Implementation of ABC helped L.G. to reduce its materials cost by 16% in 2008.

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Organization :- Charles Schwab Corporation

Services rendered- full range of securities, brokerage, banking, money management and financial advisory services through its operating subsidiaries. Stock trading activity across multiple channels such as: Branches , Call centers and Internet.

Benefits Derived- The on-line costs of the trades executed on-line were much less than trades completed through brokers. This information was used by Scwab to lower it's the processed costs by several 100 million dollars annually. This helped the organization in better alignment of product pricing and account management in handling it's diverse client segment.

Organization :- Tata Consultancy Services

Services rendered- Consultancy services

Benefits Derived- The activity based costing provided information on occurrence of different types of errors , corrective action required to take place and associated costs. This allowed the management to set better priorities in software development business.

This example will help us understand, how inappropriate basis of allocation of indirect costs can lead to misleading costs of products, especially when there is diversity in the volume of the products produced.

Traditional Costing				Activity Based Costing			
	Product A	Product B	Total		Product A	Product B	Total
1.Units produced & sold	50,000	1,00,000	1,50,000	1.Units produced & sold	50,000	1,00,000	1,50,000
2.Selling price / unit	70	50		2.Selling price / unit	70.00	50.00	
3.Direct labor cost / unit	15	15		3.Direct labor cost / unit	15.00	15.00	
4.Direct materials cost / unit	15	10		4.Direct materials cost / unit	15.00	10.00	
5.Sales revenues [=1*2]	35,00,000	50,00,000	85,00,000	5.Sales revenues [=1*2]	35,00,000	50,00,000	85,00,000
Direct costs				Direct costs			
6.Direct labor costs [=1*3]	7,50,000	15,00,000	22,50,000	6.Direct labor costs [=1*3]	7,50,000	15,00,000	22,50,000
7.Direct materials costs [=1*4]	7,50,000	10,00,000	17,50,000	7.Direct materials costs [=1*4]	7,50,000	10,00,000	17,50,000
8.Total Direct costs [=6+7]	15,00,000	25,00,000	40,00,000	8.Total Direct costs [=6+7]	15,00,000	25,00,000	40,00,000
Indirect Components				Indirect Components			
Materials purchasing	60,000	1,20,000	1,80,000	Materials purchasing	1,35,000	45,000	1,80,000
Machine setups	1,00,000	2,00,000	3,00,000	Machine setups	2,25,000	75,000	3,00,000
Product packaging	90,000	1,80,000	2,70,000	Product packaging	90,000	1,80,000	2,70,000
Machine testing & calibration	1,00,000	2,00,000	3,00,000	Machine testing & calibration	1,00,000	2,00,000	3,00,000
Machine maintenance & cleaning	50,000	1,00,000	1,50,000	Machine maintenance & cleaning	1,20,000	30,000	1,50,000
Total Indirect	4,00,000	8,00,000	12,00,000	Total Indirect	6,70,000	5,30,000	12,00,000
9.Indirect Cost - Product Volume Based Allocation	4,00,000	8,00,000	12,00,000	9.Indirect Cost - allocated based on activity drivers	6,70,000	5,30,000	12,00,000
10.Indirect Cost per Unit	8.00	8.00		10.Indirect Cost per Unit	13.40	5.30	
12.Gross Profit per Unit (2-3-4-10)	32.00	17.00		12.Gross Profit per Unit (2-3-4-10)	26.60	19.70	
13.Gross Profit Margin (12/2)	45.71%	34.00%		13.Gross Profit Margin (12/2)	38.00%	39.40%	

Fig 4

Let us consider a disruptive innovator who is selling products A & B in the market. Product B is double in volume in comparison to Product A. The total direct costs charged to the products are the same in both the methods i.e. as per traditional costing and as per activity based costing. Explanation for allocation of indirect costs:

Table 1: Traditional & activity based costing

Traditional Costing	Activity Based Costing		
Under traditional costing, all the overhead costs are apportioned to products A & B on the basis of direct labor costs or on the basis of volume of products produced & sold.	Whereas, under activity based costing, the overhead costs are allocated on the basis of cost drivers or activity drivers mentioned below:		
	Allocation driver	Product A	Product B
	# Purchase Orders	75	25
	# Machine set Ups	240	80
	# Product Packaging	50000	100000
	# of Tests	1000	2000
	# Production Batches	200	50

The indirect costs as per traditional costing charged to products are rupees 8.00 for products A & B respectively. Whereas, as per activity based costing the costs charged are rupees 13.40 and rupees 5.30 respectively. It is clear that initially product A seemed to be more profitable as per traditional costing. But as per activity based costing, it is product B. True Profitability of each product in the product mix can be judged only after understanding activities driving the costs, a key concept in Activity Based Costing Technique.

V. CONCLUSION

- ✓ By studying the cause and effect relationship, in the way the costs occur, activity based costing brings accuracy and reliability in product and service cost determination.
- ✓ The proportion of indirect costs in the total costs of the products have increased on account of use of product and process technology such as computer integrated manufacturing (CIM) and flexible manufacturing systems(FMS) . Activity based costing helps in most accurate allocation with the help of transaction based cost drivers.

- ✓ By studying the behavior of costs, activity based costing. Helps in cost reduction and finding out the activities that add no value to the products.
- ✓ Thus, activity based costing will help the disruptive innovators, in facing the global competition, by helping them in their decisions relating to product, customer and business-unit profitability.

REFERENCES

- [1] S C Vaidya and Suveera Gill, “Cost Management: A Strategic Approach”, Macmillan India Ltd.2009,New Delhi.
- [2] Charles T. Horngren, Srikant M. Datar and Madhav V. Rajan: “ Cost Accounting A Managerial Emphasis”, Pearson Publication,New Delhi.
- [3].Dr.Jawaharlal,“Accounting For Management”,Himalaya Publishing House,Mumbai.
- [4]<http://maaw.info/MAAWTextbookMain.htm>
- [5]www.google.com
- [6]Manoj Anand, B.S.Sahay, Subhashish Saha , “Activity -Based Cost Management Practices I India :An Empirical Study”, Decision January-June,2005, Vol. 32 Issue 2, p123-152.
- [7]<http://www.sepaforcorporates.com>