# A Study On Costing Models

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***Abstract-*** *The project report mainly discusses two costing models that are Activity based costing model and Target costing model how this model helps companies to get maximum profits with predetermined plan of action with some necessary changes in the manufacturing process . Activity based costing model is discussed with help of TOYOTA MOTOR CORPORATION and Target costing model discussed with the help of TATA NANO. In an Activity based costing model this report studies about Identify and eliminate those products and services that are unprofitable and lower the prices of those that are overpriced or identify and eliminate production or services that are ineffective and allocate processing concepts that lead to the very same product at a better yield. and how the activities are taken into consideration in the manufacturing process to achieve the pre-processed activities by implementing new strategies in the ongoing process of production. and coming to Target costing models is a disciplined process for determining and realizing a total cost at which a proposed product with specified functionality must be produced to generate the desired profitability at its anticipated selling price in future.it is discussed how the Target costing can be determined in the production and how they are implemented in the production process by example of Tata nano.In production of Tata nano the price of a quantity fixed before the manufacture and they go according to fixed target price of Quantity by elimination the unnecessary steps in the manufacturing. In production of Tata nano they eliminated all the luxury comforts which are actually not necessary for the Production.*

## I. INTRODUCTION

### TOYOTA MOTOR CORPORATION

### INTRODUCTION:

Toyota motor corporation is a Japanese multinational automotive manufacturer headquartered in Toyota.aichi, Japan. In 2017, Toyota's corporate structure consisted of 364,445 employees worldwide and, as of September 2018, was the sixth largest company in the world by revenue. As of 2017, Toyota is the largest automotive manufacturer. Toyota was the world's first automobile manufacturer to produce more than 10 million vehicles per year which it has done since 2012, when it also reported the production of its 200-millionth vehicle. As of July 2014, Toyota was the largest listed company in Japan by market capitalization (worth more than twice as much as number 2-ranked softbank) and by revenue.


Toyota is the world's market leader in sales of hybrid electric vehicles, and one of the largest companies to encourage the mass-market adoption of hybrid vehicles across the globe. Cumulative global sales of Toyota and lexus hybrid passenger car models achieved the 10 million milestone in January 2017. Its prius family is the world's top-selling hybrid nameplate with over 6 million units sold worldwide as of January 2017.

The company was founded bykiichiro toyoda in 1937, as a spinoff from his fathers company toyota industries to create automobiles. Three years earlier, in 1934, while still a department of toyota industries , it created its first product, the type a engine, and its first passenger car in 1936, the toyota AA. Toyota Motor Corporation produces vehicles under five brands, including the Toyota brand, hino,lexus,ranz. It also holds a 16.66% stake in subaru corporation, a 5.9% stake in Isuzu, a 5.5% stake in mazda, as well as joint-ventures with two in China (GAC Toyota and Sichuan FAW Toyota motors) one in India (Toyota kirloskar), one in the Czech republic (TPCA), along with several "nonautomotive" companies. TMC is part of the toyota group, one of the largest conglomerates in Japan.

In 1981, Toyota Motor Co., Ltd. announced plans to merge with its sales entity Toyota Motor Sales Co., Ltd. Since 1950, the two entities had existed as separate companies as a prerequisite for reconstruction in postwar Japan. Shoichiro Toyoda presided over Toyota Motor Sales in preparation for the consummation of the merger that occurred in 1982. Shoichiro then succeeded his uncle Eiji as the president of the combined organization that then became known as Toyota Motor Corporation.

Presidents of Toyota Motor Corporation:

- Tatsuro toyoda (1992–1995)
- Hiroshi okuda (1995–1999)
- Fujio Cho (1999–2005)
- Katsuaki Watanabe (2005–2009)
- Akio Toyoda(2009–present)

Chairmen of Toyota Motor Corporation:

- Shoichiro Toyoda(1992–1999)
- Hiroshi Okuda(1999–2006)
- Fujio Cho (2006–2013)
- Takeshi Uchiyamada(2013–present).

Toyota, which earlier was the world's third-largest automotive manufacturer behind American General Motors and Ford, produced for the first time in history more vehicles than Ford in 2005, and in 2006 even more than General Motors and has been the world's largest automotive manufacturer since then, except in 2011 when, triggered by the 2011 Tōhoku earthquake and tsunami, it fell to the number 3 position behind General Motors and German Volkswagen Group.

InJapan, Toyota currently maintains separate dealership sales channels.Toyota sought out to use a hierarchical marketing approach, similar to methods used in North America, but implemented it at all of its dealership chains, with some models being exclusive to particular locations.

## II. LITERATURE REVIEW

### TOYOTA CORPORATION:

According to **" Abhijeet Singh and Brijesh Kumar"** (2011): Toyota Motors Ltd, is running a program called Good life Passport to Relationship Reward, with an objective to create an innovative environment for interaction between Toyota and its customers. Members of this program are given a magnetic card in which all information is stored and this card is swiped when using any service at a showroom or workshop and it works like a loyalty benefit card.

According to "**Arvind Saxena**"(2010): Director and Board member (marketing and sales), Hyundai Motor India (HMIL) "No company in automobile sector can fight competition on price. Companies need to have the right product, distribution, CRM and after sales service network to grow.

According to "**Michael Cusumano, Steve Kahl and Fernaando Suarez"** (2008): In their research paper "A theory of services in product industries",Toyota corporation has concluded that in many product oriented industries, services have become increasingly important. In case of automobiles, many automakers generate the vast majority of their profits from a service activity closely tied to their product activity. The authors argued that despite the seeming importance of services, there is not much theory to help researchers or practitioners explain the 3 conditions under which services matter in product industries. The general view that emerges from the services literature is that services tend to become important for manufacturing firms once their industries reach a mature stage.

According to "**Milind Bade"** (2011): Toyota corporation has mentioned that toyota Limited is currently trying to move the industry from a commuter to a customer mindset and at present the focus of the company is on keeping the sub brands and the mother brand different and the main motive behind establishing individual brand is to create differentiation which would help Toyota corporation

6 Dr. A. B. Lal; Impact of FDI on Toyota corporation of India; An article published in the souvenir of National Seminar held on S D College, Muzaffanagar; 26-27 Nov., 2005; p.p. 1

## III. COST MODELS IN TOYOTA

### ACTIVITY BASED COST:

**Activity-based costing** (**ABC**) is a costing method that identifies activities in an organization and assigns the cost of each activity to all products and services according to the actual consumption by each. This model assigns more indirect costs(overhead) into direct costs compared to conventional costing.

With ABC, a company can soundly estimate the cost elements of entire products, activities and services, that may help inform a company's decision to either:

- Identify and eliminate those products and services that are unprofitable and lower the prices of those that are overpriced (product and service portfolio aim).
- Or identify and eliminate production or service processes that are ineffective and allocate processing concepts that lead to the very same product at a better yield.

**TOYOTA AND ABC:**

As in case of Toyota it targets every segment of customers, therefore it has vast range of production line.The company's main production lines are SUV's hybrid,camry,corolla,land curiser and 4 wheeler trucks.These product lines are further sub divided according to the customer range although,the costing systems that Toyota is adopting, is activity based costing and but there main focus is on target costing but target costing is related to activity based cost on three points

- To determine the estimated cost.
- Activity based costing can determine the cost drive of the product planning and the design offer.
- Activity based costing can be used as tools for achieving target cost.

In April 2001, Toyota adopted the "Toyota Way 2001", an expression of values and conduct guidelines that all Toyota employees should embrace. Under the two headings of **Respect for People** and **Continuous Improvement**, Toyota summarizes its values and conduct guidelines with these **five principles**:[76]

- Challenge
- Kaizen (improvement)
- Genchi genbutsu (go and see)
- Respect
- Teamwork

**TOYOTA GLANZA MANUFACTURING DESIGNING PROCESS:**


**1. IDENTIFYING ACTIVITIES :**

The first stage is to identify the functional areas or major activities involved in the production. Examples of activities include machine related activities, divert labour related activities and various support activities like ordering, receiving, material handling, packing, despatching. Various activities are identified by carrying out activity analysis. The activities may be basically fall into four categories as suggested by Cooper and Kaplan'.

**(a) Unit Level Activities or Primary Activities:**

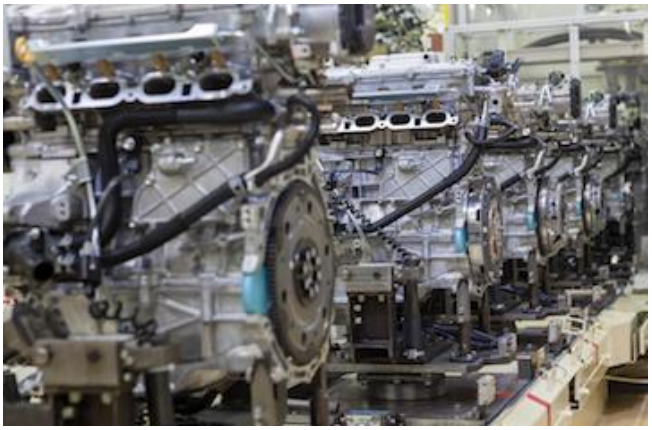
The cost of primary activities like use of indirect materials and consumables, testing of every item produced may be correlated to number of units produced (i.e. on volume-basis).

**(b) Batch Level Activities:**

These are manufacturing support activities (like material ordering, machine set-up costs, inspection of products etc). The cost of such activities is driven by number of batches of units produced.

**(c) Product Level Activities:**

Activities like designing of the product, keeping technical drawings of product, activities upto date, advertising of a specific product are called product level. The cost of these activities is driven by the creation of a new product line and its maintenance.



**2.COSTING ACTIVITIES:**

The second stage requires that a cost centre (also called a cost pool) be created for each activity. After the activities have been identified the cost of resources consumed over a specified period must be assigned to each activity. These costs will have to be apportioned on some suitable basis. For example the total costs of all set ups might constitute one cost centre for all setup related costs.

**3. SELECTING APPROPRIATE COST DRIVERS:**

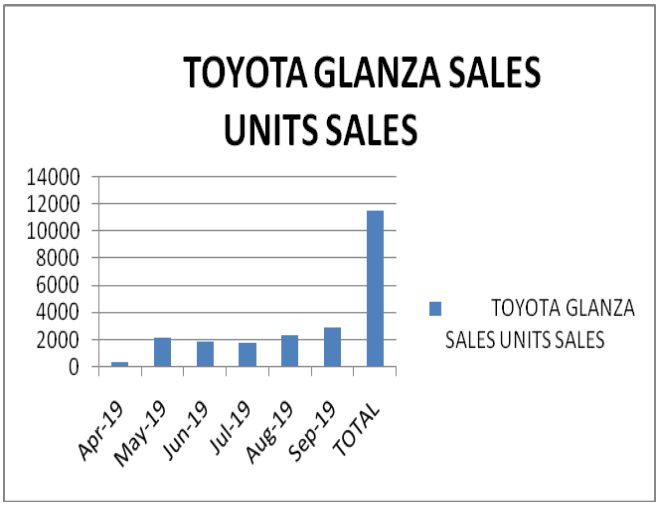
The third stage of designing ABC system is to identify the factors that influence the cost of a particular activity. The term cost-driver is used to describe the significant determinant of the cost of the activity. The most suitable cost driver in each activity under functional areas should be identified. A cost driver is any factor that influences costs.

**4. ASSISGNING COST TO PRODUCTS** :

The final stage is to trace the cost of the activities to products according to each product's demand for these activities using cost drivers as a measure of demand. A product's demand for the activities is measured by the number of transactions it generates for the cost driver. The cost driver should be measurable in a way that enables it to be identified with individual products.

**TOYOTA GLANZA SALES:**

| MONTH | UNITS SALES |
|---|---|
| APRIL 2019 | 360 |
| MAY 2019 | 2142 |
| JUNE 2019 | 1919 |
| JULY 2019 | 1804 |
| AUGUST 2019 | 2322 |
| SEPTEMBER 2019 | 2952 |
| TOTAL | 11499 |




**TARGET COSTING**

**Definition of Target Costing:**

Target costing can be defined as "as structured approach for determining the cost at which a proposed product with specified functionality and quality must be produced to generate a desired level of profitability at its anticipated selling price". A critical aspect of this definition is that it lays emphasis on the fact that target costing is much more than a management accounting technique.

Rather, it is an important part of a comprehensive management process aimed at helping a firm to survive in an increasingly competitive environment. Target costing is a management technique aimed at reducing a product's life-cycle costs.

Target costing is a disciplined process for determining and realizing a total cost at which a proposed product with specified functionality must be produced to generate the desired profitability at its anticipated selling price in future.

CIMA defines target cost as "a product cost estimate derived from a competitive market price"

**Origin of Target Costing:**

A retrograde approach for determining product costs, which is one of the most important features of target costing, can be found as early as the beginning of the last century at Ford in the United States and in the development of the Volkswagen Beetle in Germany in the 1930s. At Volkswagen, in order to meet the price goal of DM 990, alternative technical solutions were weighed on the basis of cost considerations. Yet a full-fledged target costing approach began during the period of scarce resources after World War II. During this time, Americans created a concept of maximizing desirable product attributes while at the same time minimizing product costs . The technique became known as "value engineering" and was subsequently adopted by Japanese companies in order to withstand stiff competition within Japan. In the 1960s, value engineering was combined with the idea of influencing and reducing product costs as early as possible during the planning and development stages of a product (Buggert & Wielpütz, 1995). The first use of value engineering in Japan—known as "genka kikaku" occurred at Toyota in 1963, though it wasn't mentioned in Japanese literature until 1978 Later "genka kikaku" was translated into "target costing," the term now used throughout the world. Rösler (1996) did etymological research to clarify the derivation of the term "target costing" from Japanese language, which is described in Figure 1. Even though Kato (1993) criticizes the use of "target costing" as a translation of "genka kikaku," the term has been generally accepted in the Western world. At the annual meeting of the Japan Cost Society in 1995, the official name was made "target cost management" on the grounds that "target costing" was too vague and did not convey the true meaning of "genka kikaku." In japan, target costing is has gained importance and widely practiced in more than 80%of the companies in the assembly industries and more than 60% of the companies in processing industries. It emerged in japan in 1960's as a consequence of difficult market conditions. A proliferation of consumer and industrial products of western firms were overcrowding the market in Asia.

Japanese companies were also experiencing shortages of resources and skills needed for the development of new concepts, tools and techniques, which were required to achieve parity with the toughest western competitors in terms of quality, cost and productivity.

**Objectives of target costing:**

The fundamental objective of target costing is to enable management to use proactive cost planning, cost management and cost reduction practices. Where by, costs are planned and managed out of product and business, early in the design and development cycle, rather to an during the later stages of product development and production.

Target costing is primarily used and most effective in the product development and design stage.

The costs most typically emphasized in the target costing process are such things as material and purchased parts conversion costs, tooling costs development expenses and depreciation.

It emphasizes understanding the markets and competition, it focuses on customer requirements in terms of quality, functions and delivery, as well as price. It recognizes the necessity to balance the tradeoffs across the organizations and establishes teams to address them early in the development cycle, and it has at its core the fundamental objective to make money, to be able to reinvest grow and increase value.

**Broadly speaking, a target costing system has three objectives:**

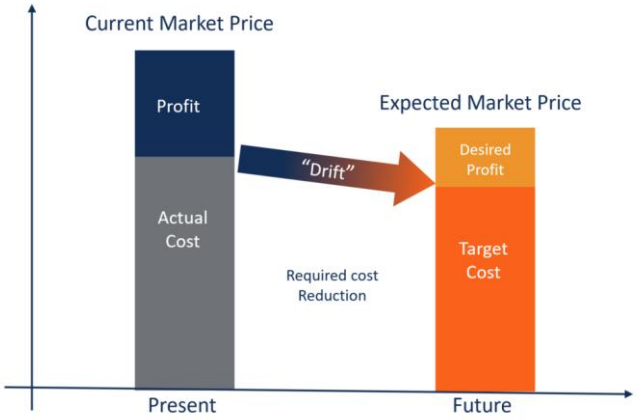
1. To lower the costs of new products so that the required profit level can be ensured.
2. The new products meet the levels of quality, delivery timing and price required by the market.

3. To motivate all company employees to achieve the target profit during new product development by making target costing a companywide profit management activity.

**Need of target costing:**

In industries such as FMCG, construction, healthcare. And energy, competition is so intense that prices are determined by supply and demand in the market. Produces can't effectively control selling prices. They can only control, to some extent their costs, so management's focus is on influencing every component of product, service. Or operational costs.

The key objective of target costing is to enable management to use proactive cost planning, cost management and cost reduction practices where costs are planned and calculated early in the design and development cycle, rather than during the later stages of product development and production.




**Steps involved in target costing process:**

The following are the main steps involved in the target costing process:

**1.Conducting Market Research**

The company should determine the customer wants precisely through conducting marketing research. A new product can be designed or make changes in the existing product on the basis of the customers expectations and perceptions.

**2.Identify the Nature of Market:**

The market information can be collected in such away that what type of products are available in the market, the level of competition prevailing, the number of competitors and the price at which existing products are available. Besides, the company should find out the affordable price of the customers. If so, the target costing is followed.

**3. Translation of Customers Requirements into Products Features:**

The preference of one customer differs from another. These preferences are collectively called as customers requirements. Now, the bundle of preferences are bringing into a tangible thing i.e. product.

**4.Development of a Product Design:**

By considering the engineering analysis of market forces, customer needs. Relevant technology, competitors models, product configuration and performance features, design alternatives, process capabilities, maintenance and services requirements etc. a suitable product design is to determined by company. Such a product design assures a targeted profits and target cost for each component in total.

**5.Determine the Price, Margin and Cost:**

Target selling price is determined on the basis of market survey, at which the product can be sold. the standard margin is also included in the target selling price. If so it is possible to determine the target cost. **Target costing = target selling price- Target profit**

**6.Conductiong Value Engineering Process:**

The company can conduct value engineering process to reach target cost. It is a well known fact that the difference between target selling price and the target profit is target cost. The target selling price cannot be changed at any cost, hence it is a duty on the part of company is that takes necessary steps to reach the target cost.

**7. Improve the Design to reach Target Cost:**

The company starts a minor trial production. Such a production ensures all products performances, target cost and target profits margin also. The trial production comes to an end whenever the product design matches the target cost.

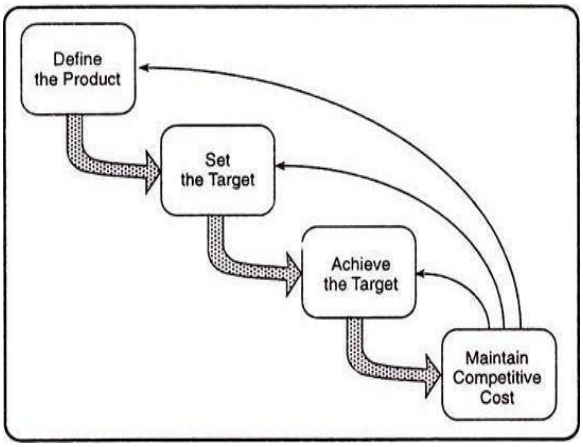
**8.Approval of Top Management:**

A detail report is presented before the top management for getting approval. The report contains the production process, elements of cost involved with levels of

costs to be incurred and design of the specified products. A formal approval is given for starting commercial production.

**9.Maintenance of Accounts:**

A separate accounting records are to be maintained for each product design. It is possible to verify whether the total expenses exceed the target cost. If the expenses are not controllable at any time, the product design will be changed. Hence, the maintenance of separate set of books are highly required under target costing process.




**Advantages of Target costing:**

1. It reinforces top to bottom commitment to process and product innovation to achieve some competitive advantage.
2. It helps to create a company's market-driven management for designing and manufacturing products that meets the price required for the market success.
3. It uses management control system to support and reinforce manufacturing strategies, and to identify market opportunities that can be converted into real saving to achieve the best value for money rather than simply achieving the lowest cost.
4. Assures that products are better matched to their customer's needs.
5. Aligns the costs of features with customer's Willingness to pay for them.
6. Reduces the development cycle of a product.
7. Reduces the costs of products significantly.
8. Increases the teamwork among all internal organizations associated with conceiving, marketing, planning, developing, manufacturing, selling, distributing and installing a product.

**Limitations of Target costing:**

1. Effective implementation and use requires the development of detailed cost data.
2. Its implementation requires willingness to cooperate
3. Requires many meeting for coordination.
4. May reduce the quality of products due to the use of cheap components which may be of inferior quality.

**Reasons for the Late Development of Target Costing:**

Although target costing emerged more than 30 years ago, yet only in 1990's this system came into notice. Main reasons for late popularity of target costing could possibly be that target costing focuses heavily on new product development and Japanese companies which practice the system most are very secretive about their new products/activities.Also, popularity of Japanese just-in-time inventory system had dominated the attention of industry in 1980's and therefore, target costing got the second seat.

**Problems with Target Costing:**

A. The development of the process can be lengthened to a considerable extent since the design team may require a number of design iterations before it can devise low cost product that meets the target and margin criteria. This occurrence is most common when the project manager is unwilling to discontinue a design project that cannot meet its costing goals within a reasonable time frame.
B. A large amount of mandatory cost cutting can result in finger pointing in various parts of the company , especially if employees in one area feel they are being called on to provide a disproportionately large part of the saving .
C. A design team having representatives from the number of departments can sometimes make it more difficult to reach a consensus on the proper design because there are too many opinions regarding design issues.

## IV. CONCLUSION

In conclusion, TC originates from Japan. It was used and adopted primarily during the 1960's by the Japanese manufacturing industry lead by Toyota. Technique came out as the result of the emerging needs, changing taste and social trends for different products having diversified characteristics. Management of TC involves not only accountants but all other supporting teams such as designers, engineers, marketers, and sales in order to succeed. The technique exerts pressure on the

individuals engaged in R&D to come up with innovative ideas to improve operations and places strictest disciplines on the production line to adhere with directives as set forth (Jack and Jones, 2008). Having qualified employees to facilitate the technique while been equip with relevant trainings is of paramount importance to deliver consistently quality outcome. The TC has proven to be successful. Those companies that have embraced the concept based on their internal needs while matching up with organizational strategy have thrived in the marketplace. They have managed to reduce costs and still make profits without sacrificing quality of their products. Due to ever-changing business environment and stiff competition coming from domestic and international markets, incorporating TC into the organizational strategy will still remain crucial. Organisations that manage to succeed in their target costing management technique are more likely to prevail and retain their competitive edge.

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