3.1.1 TARGET COSTING CONCEPT

Target costing is a method of planning and cost management and the goal of target costing is cost reduction. Cooper (1995) reported that target costing practice known as Genka-kikakikaku in Japanese and it is used by Japanese manufacturers to control product cost during product development. Target costing was initially used by Japanese automobile companies to produce future products mutually by both the designer and the supplier and it balance the lowest cost and the essential utility. Target costing is not really a foam of costing rather it is a broad program to reduce costs (Kato, 1993). The slogan “Set the target; achieve the target; maintain the target” is used in target-costing (Cooper, 2002). The Japanese car manufacturer Toyota assumed that the selling price of a product is determined by market forces (Tanaka, 1993). Currently this technique is known as target costing and the well known formula used to calculate target cost is:

\[
\frac{\text{Target/Attainable Selling Price}}{- \text{Target Profit}} = \frac{\text{Target/Allowable Cost}}{}
\]

The above equation is concerned with deciding an achievable target cost at the time of product development to realize sufficient profit margin when the product is entered into the market. Target costing sets the target cost by subtracting the target profit margin from the target price and firm determines the target selling price at which a product can be sold in the marketplace. According to Garrison et al. (2006) target costing determines the limit of allowable cost for a new product and then develop a new product that can be profitably. A market price for a product is determined first then by deducting the required profit from the market price target cost is decided, after this product is designed and developed within the maximum allowable cost. Target costing system operates at the development stage of new product through a highly competent mechanism to plan, manage and reduce costs with the cooperation of many groups throughout the organization. Target costing process initiates cost management at the first stage of product development throughout
the product life cycle by actively involving the whole value chain (Ansari et al., 1999). It mainly emphasizes the markets and customer requirements. Target costing is a discipline which stresses a better understanding of competition, markets and customer requirements in terms of quality, products, functions, delivery, time and price. Target costing is recognized as a tool to control costs and produce products ensuring that the product will give buyers the most value and at the same time for company creating a desirable profit. Target costing is more concerned about long-term cost management, it is a part of broader cost management, it coordinates the activities of product designers and it can be considered as a strategic management accounting system.

The cardinal rule of target costing is “The target cost can never be exceeded” (Cooper & Slagmulder, 1999). Cooper & Slagmulder (1997) described that core point of the target costing concept is the estimation of the attainable selling price with target profit margin to be used to determine the allowable cost for a new product. This method requires creativity, commitment, and opened working relationships and also suppliers support.

Target costing has successful implementation in the automotive and manufacturing industries in reducing costs and increasing value (Cooper & Slagmulder, 1997). Worthy (1991) said that the use of target costing reduces manufacturing cost of product. Hiromoto (1988) identified target costing is the tool which sustained Japanese corporations in the global market the competition during the 1980s. Different authors agree that target costing activities are concerned with frequent cost estimations and revisions (Fisher, 1995); serious interactions among process engineers, product designers and procurement officers (Iwabuchi, 1992) and the project manager’s powerful influence over major development decisions (Kato, 1993). All these activities reduce the manufacturing costs and also affect positively on productivity. Target costing is a management process to settle the gap between two levels of product cost from different aspects: (1) the cost at which the firm can supply its product with taking sufficient profit margin and (2) the cost that allows a firm to sell its product within market competition to consumers.

Cooper & Slagmulder (1997) stated that target costing as a system in which market, quality and functionality of the product are considered when costing a product to generate a profit level. The price of most products is decided on the basis of sum of the costs and
the desired profit margins to earn sufficient revenue by covering all its costs. Target costing is not a cost quantification technique but rather a complete cost reduction program starting even before the first preparation of the product (Kato, 1993). It is an approach aimed at reducing the cost of new products throughout their lifecycle while meeting consumer requirements in terms of quality and reliability among others examining all conceivable ideas relating to cost reduction at the planning, development and prototyping stage (Kato, 1993). Target costing is a cost management method which is customer and market orientated (Kato, 1993). Target costing is not a simple cost reduction technique but a complete strategic profit management system (Kato, 1993). The only sound way to price is to start out with what the market is willing to pay (Hansen & Mowen, 2003). Some authors commented that target costing is not a costing technique rather it is a method for efficient cost management. The target costing method forces management to change their views regarding the relationship between cost, selling price and profitability. Target costing forces on the elimination of avoidable costs without compromising the value of product. Target costing is a technique of cost management not a method of product costing.

3.1.2 HISTORY OF TARGET COSTING

Target costing was invented by Toyota Motor Corporation and it was developed in Japan in the 1960s as a response to complex market conditions but it was for the first time acknowledged in the 1990s in Western literature. Target costing firstly began in Japan as “Genka Kikaku” which translates as “Target Costing” in English literature (Kato, 1993). Toyota started applying target costing in 1963 based on stimulation from General Electric (Ansari & Bell, 1997). This date is often considered as the beginning of target costing. General Electric firm was using a similar target costing system by 1947 then Japanese steadily modified the concept. Thus, it can be said that target costing may have been applied far before the early 1960s. The wide concept of target costing adopted after World War II when USA created a concept of minimizing product costs with maximizing desirable product (Feil et al., 2004). This was known as value engineering. Then Japanese combined the value engineering concept with their idea of product cost reduction during production stages (Tani, 1995). The Japanese industry modified the American idea of
value engineering and expanded it into a dynamic cost reduction and profit planning system (Ansari & Bell, 1997). Now value engineering is used as a tool in target costing process.

After World War II many Japanese manufacturers struggled to provide products at or below market price. Mass production from Japanese companies demand to supply products with customer expectations in 1960’s. Customers became more choosy about the goods they were consuming. As a result many problems had to be solved to sustain and respond to the demands of the market. The highly competitive environment was the main contributor to which Japanese companies were subjected for the development of target costing or this was evolved in this context. Sakurai (1989) mentioned that increased consumer demand and shortening of product life cycle were the reasons for the application of target costing in Japan. Almost Japanese assembly companies and car manufacturers use target costing. Some American companies such as Ford and Chrysler and also other countries companies have started to use this approach in order to compete in market. Pierce (2002) highlighted from a survey that target costing is a widely used technique. There are two major reasons for the development of target costing as: (1) companies have less control on price because price is determined by the market demand and (2) most cost of product is engaged in the design stage.

3.1.3 DEFINITIONS OF TARGET COSTING

In literature there are many definitions of target costing. Many authors defined target costing as a result different definitions of target costing can be found in the literature. All most definitions focus on the cost reduction but definitions differ in the scope of cost reduction. Some authors described that target costing is a method for efficient cost management and it is not a “costing” technique (Tani, 1995). Some authors definitions consider only design and product development while others take the entire product life cycle into consideration. Here are some definitions and views on target costing given by different authors.

Tani et al. (1994) described that target costing as a part of wide product/service cost management process which is concerned with achieving target costing together with the planning and new product development.
Langfield et al. (2006) explained target costing as a system of cost management and profit planning which determines the life cycle cost of product to generate desired profit of firm at anticipated selling price.

Williamson (1997) mentioned that target costing is a process for ensuring that products are designed in such manner that the company can sell them reasonably and still makes a fair profit.

Monden & Hamada (1991) defined target costing as “The system to support the cost reduction process in the development and designing phase of an entirely new model, a full model change, or a minor model change”.

Hilton (2008) defined target cost as the projected long-run cost that will enable a firm to enter and remain in the market for the product and compete successfully with the firm’s competitors.

Cooper (2002) explained that target-costing is a structured approach to determine the cost at which a proposed product with specified functionality and quality must be produced in order to generate the desired level of profitability over its life cycle at its anticipated selling price.

Horvath et al. (1998) stated that target-costing is a strategic cost management approach for reducing cost over the whole life cycle of a product.

Swenson et al. (2003) defined target costing as “a systematic process of cost management and profit planning”.

Cooper & Slagmulder (1997) defined “Target costing is a disciplined process for determining and realizing the total cost at which a proposed product with specified functionality must be produced to generate the desired profitability at its anticipated selling price in the future”.

Kato (1993) asserted that it is an important technique used during the design stage for managing costs of product. It is also called “reverse costing” and “market driven costing”.

Sakurai (1989) argued that target costing is a means to reduce cost during the different stages of a products development and it is taking place in Japanese industries such as automobile and electronics manufacturing firms.
Tanaka (1993) asserted that target costing is a collaborative process from both designers and managers in order to achieve the goal of product’s target cost.

Ansari & Bell (1997) defined “The target costing process is a system of profit planning and cost management that is price led, customer focused, design centered, and cross functional. Target costing initiates cost management at the earliest stages of product development and applies it throughout the product life cycle by actively involving the entire value chain.”

Horvath (1994) mentioned that “Target costing is a set of management methods and tools used to drive the cost and activity goals in design and planning for new products, to supply a basis for control in the subsequent operations phase, and to ensure that those products reach given life cycle profitability targets.”

Ansari et al. (1999) defined target costing as a tool of profit planning and cost management which is price focused, customer focused, designed centered and cross-functional.

Fisher (1995) stated that target costing is a systematic process for product costs reduction which starts in the product planning stage.

Bonzemba & Okona (1998) defined target costing as a strategic cost management approaches which is an “open system” which links external and internal factors from the inception...the key success factors (cost, quality, innovation, and time) of a product are carried out mainly at the development and design phases.

Finally from all definitions target costing can be defined as a method of cost reduction suitable in a competitive market where market prices drive cost decision and cost planning, and cost management occurring early in the design and development stage of new products through cross functional team involvement.

From the above definitions it is concluded that target costing is a process, system, technique, tool, instrument and method for product planning and development. This fact is depicted in the following figure.
3.1.4 FEATURES OF TARGET COSTING

Many authors defined target costing in their ways. On the basis of above stated definitions features of target costing can be described as:

- Target costing method is suitable in a competitive market environment.
- It follows a cardinal rule “Target cost can never be exceeded”.
- Market target prices force cost and investment decisions.
- Cost planning is necessary.
- Requirement of cross-functional team involvement and the execution of target costing requires co-operation of all departments. Experience and intuition of different departments are extremely important.
- It is different from the traditional costing systems.
- It is not a method of cost control but it intends to reduce cost.
- Target costing takes place within the strategic planning (Ansari & Bell, 1997).
- Target costing is defined from the customer’s viewpoint about functionality, cost and manner of delivery.
• Target costing integrates a wide range of costs during mainly design and development phases of the product or in the process of target costing, management of cost reduction occur early in the design process.
• Target costing process uses many techniques like value engineering, quality function deployment etc. for cost reduction of components.
• The target selling price and target profit margins are set during product planning phase of the product.
• Target costing is a strategic cost management tool which is used for managing future products costs.
• Reducing the cost with the cooperation of entire supply chain.
• Requirement of an effective communication system to provide different information.
• Target costing mainly consider the reduction of direct/variable costs and it is applied during developing and designing stage of product life cycle.
• The target cost is set before start of actual production and it is subdivided into various components, functions and cost items.
• It is an effective method in the multiproduct-small quantity production run firm than those firms who are producing the few product in large quantity.

3.1.5 OBJECTIVES OF TARGET COSTING

According to Monden (1995) the two focal points of target costing are: (1) the cost of new products should be low to ensure the required profit margin with high levels of quality, delivery timing and price desired by the market and (2) to achieve the target profit during new product development company’s employees should be motivated. The fundamental objective of target costing is to increase profit, growth and increase value. The overall central goal of target costing is to ensure that no unprofitable product should be produced and it realizes a finest trade-off between three elements quality, cost and functionality (Cooper, 1995). Target costing as a disciplinary system contributes to realizing these goals. According to previous studies the objectives of target costing can be summarized as:
• Improved profitability.
• Highly visible or realizing low cost targets for the cost reduction of new products.
• Product quality assurance.
• Timely introduction of new products into the market.
• Improved product development process.
• Reliability of price.
• Better skills of production and marketing.
• Increased emphasis on cross-functional team working.
• More focus on customers satisfaction.
• Production of right products at competitive prices to attract customers.
• Proactive cost planning and cost reduction practices.

The main goal of target costing is maximize the gap between value and costs of product.

3.1.6 SURVIVAL TRIPLET

Cooper & Slagmulder (1997) revealed three characteristics of product which are known as the survival zone or survival triplet and it plays a vital role in the success of firms. The survival triplet consists internal point of view as producer’s perspective and external point of view as customer’s perspective. Three product feature from customer point of view as survival triplet are product price, product quality and product functionality while from a producer point of view these are product cost, quality and functionality. Hence, three characteristics of product as survival triplets are quality, functionality and cost/price. Cooper & Slagmulder (1997) asserted three survival product-related features which play a critical role in shaping the success of firm. The product survival zone shows minima and maxima of the three elements quality, functionality and price. Company has to decide maximum feasible and minimum allowable price/cost, quality and functionality. Cooper & Slagmulder (1997) described that the minimum allowable level of both quality and functionality have lowest value and the maximum feasible levels of both quality and functionality have highest values of product characteristics for consumers. The minimum allowable functionality is that point of functionality under which customers do not prefer product while the maximum feasible functionality is that point of functionality over
which it would be costly for firm to maintain customers at high price. Irrespective of the quality and functionality the maximum allowable price is the highest selling price of product that will be accepted by the customers and the minimum feasible price is the lowest price decided by the firm according to the quality and functionality of product. There is no ideal balance between these three product features for all firms due to differences in environments, intensity of competition, customers’ sophistication and products. The maximum allowable level is decided from the customer’s perspective and minimum feasible level is decided from the firm’s perspective. It is not easy for companies to respond according survival zones to launch successful products. The elements of survival triplet approach are mentioned as under:

- **Cost/Price** is the amount paid for the resources consumed to get the product into the market place for consumers. Cost includes all production costs, research and development costs, marketing and selling costs. Price is the amount charged from the consumers for the product.

- **Quality** may be defined as the performance of functions of a particular product. It is related with the product specification. There is a difference between quality and functionality. Quality is the level or degree of functions performance of a product for example standard or substandard product may perform same functions but both are different according to their qualities.

- **Functionality** is multidimensional and it is also related with the product specifications. Functionality is the level of success in designing the product to meet the product specifications required by customers (Cooper, 1996). It includes different functions of the product or it is concerned with the use of product. Functions are the product’s characteristics that can satisfy the customer. A function is a mean or a purpose that a every product is expected to perform.

The survival triplet/zone of a company is shown in following figure.
Figure 3.1.2: Survival zone of a product

Source: Adapted from Cooper & Slagmulder (1997)

Every product is sold by the firm according its different value or characteristics. For every product the gaps between the allowable and feasible limits of all three aspects must be focused for the acceptance of product in the market successfully. Designers must try to shorten the time needed to add new features or change the nature of product. Companies have to manage the cost of product effectively with the spirit of work force. The survival triplet is recognized as the strategic limit for the target costing and if these understand well then it will increase the benefits from target costing. In competitive environment this survival zone is the key of success and company must be given attention to all three dimensions instead of any one of the three dimensions.

3.1.7 PROCESS OF TARGET COSTING

Fisher (1995) mentioned two separate phases of target costing process. The first phase involves determination of target cost and the second phase involves attaining the target cost through product design. The basic steps for implementing target costing is to decide the target cost, achieve the target cost and then maintain a aggressive cost reduction during the product life cycle. There is no single definition and process of target costing in literature. In the process of target costing the variable and fixed costs of product are tried to reduce by taking several actions and tools (Williamson, 1997). Target costing process consists two major phases (1) establishment phase and (2) implementation/attainment
These phases of target costing involve at different stages of product development cycle. The first phase defines goals based on strategic plans and this phase focus the product concept and determination of allowable target cost for product and the second phase achieves the set goals or convert the allowable target cost into actual cost (Ansari & Bell, 1997). According to Cooper & Slagmulder (1997) the general rule of target costing, is that cost can never be exceeded, has three consequences which are: (1) when costs increase then they have to reduce, (2) launching a high cost product is not allowed and only profitable products are launched and (3) manufacturing cost is managed carefully to attain the target cost. The previous studies like Sakurai (1989), Kato (1993), Tanaka (1993) and Ansari & Bell (1997) have described different steps of the target costing process. Some general but vital steps of target costing process have been identified and these steps are:

3.1.7.1 ESTABLISHING TARGET PRICE

Establishing target selling price is the starting point for the determination of target cost or first step in this process. Target price is the selling price of a product that the consumers or marketplace accepted to pay for the product, which is based on market analysis. Ansari & Bell (1997) pointed out that Japanese companies use four major factors in the price determination in the process of target costing and these factors are: (1) the consumer needs concerning the product performance and features, (2) the customer’s willingness to pay for product features, (3) the estimated competitors product price and (4) the required market share. This step considers firstly the market present and future needs, next is customers wants and how much they are actually willing to pay for product and lastly current and future products offered by competitors. Target selling price for a new product is set on the basis of market research (Cooper & Slagmulder, 1999; Kato, 1993). Thus, firstly in this process target price is established in the context of market needs and competition. Ansari & Bell (1997) explained first step of target costing involves market analysis, customer surveys and competitors analysis to determine the product attributes or demands and customers’ needs.

Market Analysis for Setting Target Price:

Target selling price is done through market analysis. Perceived value influences the target selling price and it creates the need of market analysis. The target selling price is the first
step of the target costing process and its determination is based on market analysis. Market analysis aware the company about the market. Market analysis includes both feed-forward and feedback information. Feed forward information refers market and customer attitudes while feedback information refers actual decision and action data such as product failures, purchases, returns and complaints. Ansari & Bell (1997) suggested that feedback information is more important than feed forward information. But both type of information have to be collected at the same time for complete knowledge of situation. Feedback information is essential or key enabler in the target costing process. A company has to make a balance between accurate, cheaper and quicker information. In whole the first step involves three aspects of information before setting target selling price as market analysis and these are:

- **Market surveys/research:** This provides quantitative information regarding market fluctuations, expected changes, target customers and the needs and wants of customers for a particular product.

- **Customer surveys:** Through customer surveys the data about customer’s willingness to pay for each function/feature of product can be collected. The satisfactory price is decided through these surveys. Through this study the market core features of customers can be identified like their ages, family type, sizes and their incomes level. The ways to attract them to buy a product and upgrade the product can also be identified to satisfy customers.

- **Competitive analysis:** This analysis helps to know the position of competitors, their product prices, product functionality and their ways to evaluate the products. This gives the company a hint to launch the product or not. Also company can take information about their future market share which helps them to lead over their competitors. Competitive analysis compares the products offered by the competitors currently to target customers, perception of customers’ about these products and expected reaction of competitors after the introduction of the new products.

**Setting Target Selling Prices for Different Products:**

The target selling price is the starting point of the target costing process activities. Perceived value of consumer and availability of competitive products influence the target
selling price. Core factor is the perceived value. Target selling price reflects a balance or trade-off between profitability, market share and objectives of company. Setting target selling price for a new product is very complex because to estimate market behavior, the company does not have any significant or historic cost information. To determine selling price for new product company is made intensive market research and above stated analysis. Setting target selling price for a modified existing product as a new product which has some feature of old product is comparatively easier because company has some historic cost information, market information, competitors information and company can assess the performance of the product. Thus setting target selling prices for new product than an existing product is difficult.

3.1.7.2 ESTABLISHING THE TARGET PROFIT MARGIN

After the target price has been decided, target profit margin is determined. The target profit is that amount which a firm want to yield by selling product at a particular target price. Top management considers strategic and long term financial goals and the company’s desired market share for the setting of profit margin and try to design every product to achieve these goals. The target profit margin is based on the firm’s profit planning and long-term strategic and financial objectives of the firm. According to Kato (1993) target profit margin for a product should be based on corporate strategic profit planning and medium-term profit plans. Sakurai (1989) argued that guidance of top management for target profits is needed in target costing process. The desired profit is usually based on the return on sales of the company and it is sensible for technical and strategic reasons. The total target profit is calculated as a ratio or percentage of sales. On the basis of return on sales total target profit for a new product is calculated in following manner.

*Total Target Profit = Target Sales x Return on Sales Ratio*

*Target Sales = Expected or Target Selling Price Per Unit x Expected Sales Volume*

The target profit margin for a future product is estimated during product planning. On the basis of profit determination some authors defined that target costing is a profit management technique.
3.1.7.3 SETTING THE TARGET COST

The target cost of the new product is determined in this step. The main aspect in the whole target costing process is, what should be the cost of new product? After determination of the target sales price based on all three analysis the desired profit is subtracted to set the allowable cost. This is sometimes referred to as the engineering cost. This step of the target costing process is the cornerstone that needs to be cautiously performed to arrive at meaningful target. In this step calculation is made for the probable cost of current processes for the product. Target cost is the amount by which costs must be reduced. The target cost is set before start of actual production or before design development of the new product development process. Cooper & Slagmulder (1997) stated that the allowable cost does not signify the capabilities of the firm and allowable cost is often unfeasible in the short period. Target cost is set between the expected cost and the allowable cost. Different authors give different methods to set the target cost. The allowable cost is the maximum aspiration of the management and it is difficult to attain this cost in the short run (Monden, 1995). According to literature target cost and the allowable or acceptable manufacturing cost can be computed as:

(1) \( \text{Allowable Cost} = \text{Target Selling Price} - \text{Desired Profit Margin} \)

\[ \text{Target Cost} = \text{Allowable Cost} - \text{Expected Cost} \]

OR

(2) \( \text{Target Cost} = \text{Market Driven Selling Price} - \text{Desired Profit Margin} \)

Some previous studies stated that both target cost and allowable cost are same. In the first equation allowable cost is the difference between the target selling price and the target profit margin and target cost is the gap between the allowable cost and expected or current cost. In second equation target cost is the difference between target selling price and the target profit. According to previous studies allowable cost and estimated cost are different costs. On the basis of return on sales the allowable cost can be compared with estimated cost. Because estimated cost is based on the current level of materials, labour and overhead cost. The gap between estimated cost and allowable costs is reviewed then attainable target cost is established. Allowable cost is set on basis of external factors and it does not consider design and production capabilities of company therefore it is difficult for the company to achieve the allowable cost in short period. Thus, designers set target
Cost. Cost of existing products provide cost information for future products. Such cost estimation is called the current cost or ongoing cost. Actually the difference between allowable cost and target cost also is the key focus point of target costing process. Target cost should be justifiable. If the target cost is too high then employees may lose their motivation and give up. If the target cost is too low then it can be achieved easily and it may not motivate the employees or the planners and designers. Thus, target cost should be achievable but not easily achievable. But success is determined through the final target cost of product not through the costs of separate components or functions. Kato (1993) argued that a commitment is required to achieve target cost. Agreed target costs are final and the target costs are not changed during the development process. The following figure shows relationship between the target selling price, target profit margin and allowable cost.

![Figure 3.1.3: Setting target price, cost and profit in target costing process.](image)

**Source:** Adapted from Cooper & Slagmulder (1997)

**Different Cost Terms of Target Costing:**
Operational and strategic efficiency can be taken with the use of strong strategic management method which is target costing (Feil et al., 2004). According to Cooper & Slagmulder (1997), Ansari et al. (1999) target costing is a proactive and price based system which starts before production. Target costing uses different cost terms which are considered during the entire process of target costing and these are:
• **Market Cost**
Market cost is the benchmark or standard cost. This cost is based on the current best practices or the existing price in the market for parallel products.

• **Allowable Cost**
Allowable cost is the maximum amount a customer can afford or is willing to pay or spend on the product. This is based and set on market competitive conditions and also on management decision. The allowable cost is the highest permitted amount or the maximum cost that may be decided in the product planning process for a product to get the profit goal of firm. In other words the allowable cost represents the maximum cost of product at which the particular future product must be manufactured to take the target profit with predetermined target sales price.

• **Expected Cost**
Expected cost is the calculated or estimated cost of a product in its existing stage. Sakurai (1989) used the terms “drifting costs” or “ongoing cost” or “current costs for a future product. Current cost also known in literature as the “drifting cost” or “estimated cost”. Kato et al. (1995) described the ongoing cost as the excellent estimate of the cost of future product and it is based on the actual cost of existing products. It represents the cost that would occur if existing process technologies and product designs are applied for a new product.

• **Target Cost**
Target cost has different mean for different authors. Some refer it is the gap between the target price and the target profit. Others refer it as the gap between the allowable cost and the current cost. Generally this is that cost which must be reduced to achieve the allowable costs.

**Allowable Costs ≥ Expected Costs ≥ Target Costs**
The target cost is always fix below the expected and allowable costs to encourage innovation and value to the customer. If the expected cost is higher than the allowable cost then product can be abandoned, revised or redesigned.

The different terms of costs linked with target costing are depicted in following figure.
Figure 3.1.4: Different cost terms linked with target costing

Source: Adapted from Rybkowski (2009)

**Equation Based Relation and Calculations:**

Monden & Hamada (1991) presented that the ratio of direct or variable costs to total manufacturing costs has increased up to 90% and direct material costs to total variable costs ratio is about 85% in the automobile industry which is the main cause of target costing adoption. Target costing is a mean to manage specially direct material costs (Monden & Hamada, 1991). Tani et al. (1994) stated that in the computation of target costs generally all direct costs are included. Fixed manufacturing costs are excluded from target costing because fixed manufacturing costs stand for long period, these are for overall production capacity and not covered under value engineering. Several authors stated that target costing often begins in the purchase department. Negotiation plays important role in every step of target costing process such as negotiations about the assignment or decomposition of the target cost among different functions or components of the product. The following equations explain the relationship between different terms profits, sales and target cost. Formulas regarding target cost calculation are presented in the following table as under:
Table 3.1.1: Target costing calculation formulas

**Source:** Adapted from Bayou & Reinstein (1998)

**Methods for Setting Target Cost:**

Everaert et al. (2006) stated that popular methods for setting target cost of product are: Deductive and Bottom-up methods. The dominant method is the top down method. The deductive method is commonly explained in previous studies and this method is also called subtraction or top down method, in this method the target cost is the allowable cost which is the gap between the target selling price and target profit margin. In this method target cost more or less is imposed on product development team. The bottom-up method is also called adding-up method. In this method setting of target cost starts from the product development team or department itself. Kato (1993) described that in bottom up method cost is estimated for each component on the basis of actual or current cost then total target cost is set by adding up all individual parts or subassemblies target costs. In adding up method target cost for each component or activity or function is anticipated on the basis of current cost level with considering all potential cost reductions. By reducing components costs companies can reduce the cost of product. This method is based on the past cost data and existing technologies of the company. The basic idea of the deductive method according to Kato (1993) is:

**Target Cost** = **Expected Selling Price** – **Target Profit**

This method focuses two important elements namely the target price and the target profit. The basic thought of the adding-up method is under stated:

**Target Cost** = **Sum of Costs of all Components of Product**
According to Kato (1993) the deductive method is better than the adding-up method because the adding up method does not provide a logical connection between profit and business plans of the company (Kato, 1993). Bayou & Reinstein (1997) pointed out two reasons of the superiority of deductive method which are: (1) it connects the target cost of product to the target profit and (2) it uses the mechanism of value engineering. The adding up method is simple than deductive method (Kato, 1993). Sakurai (1989) argued that combination of both deductive and bottom-up methods would direct best results.

### 3.1.7.4 ESTABLISHING CROSS-FUNCTIONAL TEAM

After the determination of target cost there is a requirement of cross-functional team to achieve that cost. The target costing process requires commitment, innovation, creativity and opened working relationships. The general rule of target costing is that target cost can never be exceeded and it requires a strong commitment from all members to attain the target cost. In order to achieve the target price cross-functional team members of the firm, work towards designing a product on target cost. Cross-functional teams as a group activity by involving all employees conducts a functional cost analysis or use value engineering tool. The target costing team has members from different departments like personnel from purchasing, marketing, design, engineering, production, accounting, information systems, operations, research & development and cost planning to reduce the overall product cost. The top managers who have knowledge of the company’s strategic plans and goals lead cross-functional team. Target costing process is a collective effort. The team members have to collaborate their activities and prepare an overall achievable plan. Kato (1993) argued that target costing has positive impact on new product design and development and it should be used with caution, also for creative products design engineers should be worked under relaxed conditions not under time pressure. In the target costing process designers of products are the main persons who reduce costs, because they identify the most appropriate actions for product design and cost reduction.

### 3.1.7.5 DETERMINE THE DRIFTING COST

Actual or present cost of manufacturing also known as drifting cost. This cost is estimated by the cross functional team with the assistance of the engineering department. It is determined to get the desired functions of new product which can be provided or
adjusted up to the limit of target cost. The current cost of product is reduced to achieve the target cost by applying target costing tools like value engineering.

3.1.7.6 USE OF TOOL VALUE ENGINEERING

Once the target cost has been determined tool value engineering is taken into consideration to achieve it. This step considers costs and processes for designing specification of the product. If the estimated current cost of new product is equal to the target cost then the new product production decision is taken but when new product cannot be realized the target cost or there is a gap between drifting cost and target cost then the product is redesigned or the process of manufacturing is improved to achieve this. At that time value engineering tool is used to adjust the costs of components or functions to take cost efficiency. Through value engineering the components or functions of product that have comparatively high cost then their functionality are redesigned to reduce costs. In this step representatives from all departments get together to make decisions about product design. The target cost is decomposed into various components, functions and cost items of the product. Dividing the target cost into various product components is a difficult issue. Cooper & Chew (1996) argued that for cost reduction target costs should not be decomposed uniformly across all the departments.

According to previous studies the function oriented, the component oriented and cost assignment methods are used for target cost decomposition. In the function-oriented method the total target cost is allocated for different functions of the product. In component method the target cost is allocated for different components or parts of the product. Cooper & Slagmulder (1997) pointed out that component method of target costs decomposition should be set only when the components of product can be clearly identified. Component method is suitable when new product has design or features like old product because this method is based on historical cost information. It has been stated in previous studies that the component method is suitable for complex and innovative products because designers can be used their creativity for product design. Monden & Hamada (1991) mentioned that cost assignment method allocates target cost into cost items such as material cost, direct labour cost and purchase cost etc. The general target costing process is demonstrated in the following figure.
3.1.7.7 ACHIEVEMENT OF TARGET COST

Kato (1993) described that cost information must be provided anytime the designers require them and not only during product development and design process. In this step estimated cost of future product is compared with its target cost during product development. Cooper & Slagmulder (1997) argued that top management constantly monitored the work progress of design engineers towards achieving the target cost.
Companies use a standard system for summarizing cost data (Kato et al., 1995). Team members use their cost documents at any time according to their requirements. Cooper & Slagmulder (1997) stated that the chief engineer continuously check the progress of cost reduction. Through continuous monitoring corrective actions can be taken to achieve the target cost.

3.1.7.8 FINAL DECISION

If the new product is found satisfactory or profitable after value engineering activities then product is manufactured in the company and when product does not appear profitable then company can abandoned the product. It is essential to ensure that the new product will be profitable through its complete life. After the determination of drifting or expected cost, target cost is compared with expected product cost at different points during new product development and if target cost is higher than the expected cost then the company has mainly two options. First option is to cut costs by redesigning the product through change in engineering process. This is done by design team members through investigating the need of each component cost. Second drop the idea of production of that particular product. When the target cost is achieved then company can take final decision of manufacturing the product.

3.1.8 PRODUCT DESIGN AND DEVELOPMENT PHASES

Many researchers stated that up to 80% costs of product is determined during design phase. In this stage large cost reduction possibilities can be found. Target costing divides the product development processes or target costing consists two main phases first establishment phase and second attainment phase for new product development (Ansari & Bell, 1997). The first phase is the establishment phase or product planning stage or it is also the product concept development and feasibility testing stage and it defines the position of the product. The second phase of the target costing process is the attainment phase or the design development stage and in this phase product design is finalized which ends with the production stage. The phases of product design and development are classified on the basis of decisions and functions regarding product. According to Amara (1998) there are four phases of product design and development of the product. These phases are:
(1). Product Strategy and Profit Planning
This step focuses and defines the strategic and financial goals of the firm which is based on the planned rate of return and market related plans. The desired rate of return sets according to the expectations of stockholders and price of competitors products.

(2). Product Concept and Feasibility
In this step feasible product concepts are determined. This phase considers customer attributes and costs for designing the fresh or new product. In this step target selling price, target cost and drifting cost for new products are determined. This step does not determine the manufacturing process but this step analyses different product concepts to determine the best concept. According to Amara (1998) this step includes customer demands, method of manufacturing and desired profit margin. The product concepts focuses to meet the customer requirements or needs and after this point functions of product are analyzed. Various factors are considered at the time of designing product such as life cycle of product, competition, material, performance of product etc. Various departments members are contributed in product concept through their functional knowledge. Under product concept and feasibility stage, it is analyzed that target costs are achievable or not.

(3). Product Design and Development
In this step the product concept of step second is refined to add more functions and to reduce costs of product. The third phase includes process improvements and also in this step design of product and manufacturing methods are finalized. This step includes quality function deployment to establish the relation between quality characteristics and customer demands. Manufacturing processes are analyzed to know whether extra customer requirements can be provided without adding major costs. Quality function deployment tool helps in designing products efficiently by improvement efforts. After establishment of product design to achieve them value engineering tool is used in the process of cost reduction. Cost reduction depends on the manufacturing processes and the type of product. According to Amara (1998) product concept is considered economically feasible when the actual or current cost of manufacturing the new product is lower than the target cost. In case when actual or current cost of manufacturing the new product is
higher than the target cost then product cost is reduced by improved manufacturing process. Cost reduction can be reached by recognizing when and where the costs occur.

(4). **Production and Logistics**

Actual production starts when the target cost is considered achievable. This phase mainly involves implementing the manufacturing processes. After this frequent customer surveys can be conducted to determine changes in customers’ needs and to modify product accordingly.

**Figure 3.1.6**: Product development cycle and target costing method

**Source**: Adapted from Ansari & Bell (1997)

The four phases of product design (1) product strategy and profit planning, (2) product concept and feasibility, (3) product design & development and (4) production and logistics given by Ansari & Bell (1997) and Amara (1998) with the target costing process are depicted in the figure 3.1.7. The figure shows that (1) product strategy and profit planning is considered in first two steps of target costing, (2) product concept and feasibility is considered from the determination of target cost to the decision of product feasibility, (3) product design & development is focused after the decision of product feasibility to product profitability or to attain the target cost then (4) production and logistics stage covers the final decision of product manufacturing. This can be noted that the process of target costing involves different stages of product development. Thus, target costing is mainly applied for the cost reduction of new or future products.
Consider Strategic and Financial Goals

Determine Customer Attributes Target (Price, Profit and Cost)

Consider Cost of Material, Manufacturing etc. when Designing a Product

Is Product

Yes

Abandon Concept

No

Is Target Cost = Actual Cost of Manufacturing

Yes

Identify Functions to be improved by Using Tool Quality Function Deployment

No

Reduce Cost of Manufacturing by Using Tool Value Engineering

Calculate the New Product Costs

Product is Profitable, Manufacture the Product

Constantly Analysis to see Product Meets Strategic Goals and Profit Plans

Consider Strategic and Financial Goals
Figure 3.1.7: Target costing process and product design & development phases

Source: Adapted from Amara (1998)

Product development can also be divided into four continuous phases product planning, basic design, detailed design and process design (Shimizu & Lewis, 1998). This cycle of four phases is effectively repeated if any refinements is necessary to attain target cost. These four phases have similar application as above stated four phases. According to Shimizu & Lewis (1998) all these four phases are used to ensure attainment of the target cost and these four are described as under.

- **Product planning phase**: On the basis of concept, size, weight, shape, colour and expected performance of product its rough blue print are drawn up. These blue prints are also taken into consideration for target cost determination. This phase helps in the determination of product lead or development time and operational activities.

- **Basic design phase**: In this phase additional fundamental plans for the product design ideas and potential cost reductions are prepared to be achieved in next phase.

- **Detailed design phase**: In this phase product basic plans are further classified in detail for the functions or the components of the product. In this phase comparison is made between blueprints and basic plans for each component with the design of production.

- **Process design**: In the fourth phase on the basis of above three phase blueprints are converted into final product.

### 3.1.9 ESSENTIALS FOR TARGET COSTING

A rational and transparent target costing process can motivate employees to take up difficult targets. Target costing process should be rational and agreed otherwise no one will accept their responsibility for achieving the targets (Kato, 1993). It is necessary that employees believe the targets and commit themselves to attain the targets. According to previous studies following points should be considered as important precautions for the successful application or implementation of target costing.
Cooper & Slagmulder (1997) asserted that greater level of coordination between marketing and product design can successfully implement target costing.

Target cost should be set reasonable not very high or low. Because if it is set on very high then it can increase pressure on members and target costing might then be in jeopardy (Cooper & Slagmulder, 1997). Opposite side if target cost is set on very low level then it will be easy to attain but firm will lose its competitive advantage.

Factors such as the degree of innovation, the firm’s technologies, the complexity of the product and the degree of integration among different departments significantly influence the whole target costing process.

Research and development expenditures consume a big portion of the total expenditure in most manufacturing firms so companies must ensure the profitability and must confirm that new product will cover all these expenses.

Cost reducing design efforts must be justified and there must be a tradeoff between expenditures on costly efforts and future benefits (Ewert & Ernst, 1999).

The way of motivation to managers and non managers regarding cost reducing efforts is important. It must be assumed that employees and design engineers will not perform cost reducing efforts without any incentive therefore a sound internal incentive system must be existed in the firm.

Learning environment has an good effect on performance and it can lower costs as well as increase output level.

For successful implementation of target costing an absolute proper work knowledge is necessary because lack of understanding of work and its concept can be hinders in its implementation.

Proper information should be provided to team members.

The duration of the target costing process is not fix but it should be proportional to the life cycle of product.

Improved transport facilities because the delays in transporting or more time in delivery of new products to the market can result in lost the opportunities (Garrison et al., 2003). As well as deliver of raw material is also necessary.
• Cooperation, links and communication within supply chain members and cross functional teams are required.

3.1.10 SUITABILITY
Gagne & Discenza (1995) described that target costing is more suitable for assembly orientated industries, those producing diversify products rather than in repetitive process industries those producing uniform products. Other general situations of target costing suitability as per previous studies are summarized as under:
• Target costing is more useful for products with a long life cycle like in the motor industry than in industries such as medicine, electronics, steel etc.
• Target costing is more useful where rate of innovation is really rapid.
• The introduction and delivery time-to-market of product is minimum.
• Target costing is suitable to multi-product or diversifying products producing firms than in the few-products producing firms.
• Companies use technologies of factory automation and computer aided design and manufacturing.
• Flexible manufacturing systems.
• Increased competition.
• Introduction of new products in the market and diversified customer’s needs.
• Those companies which use systems of cost reduction during planning, design and development stages of product life cycle.

3.1.11 TRADITIONAL COSTING VS. TARGET COSTING SYSTEM
Garrison et al. (2003) described the difference between price setting of a product by using traditional costing methods and target costing. The cost plus system is also known as traditional costing system. Traditionally manufacturing firms were interested in “cost-plus” approach to estimate the product price. In “cost-plus” approach manufacturing process is determined to identify the total costs of the components then a percentage of profit is added up to set the price of product. Conversely target costing determines an “allowable” product cost and to decide allowable cost its process starts from market price which is determined by market research and planned desired profit margin is subtracted.
from selling price to determine allowable cost. Butsher & Laker (2000) said that traditional costing is ‘inside-out approach’ and target costing is ‘outside-in approach’. Following rules given by Cooper (1995) are used in these costing methods.

**Target Costing:** Target Selling Price – Target Profit = Target Cost

**Cost Plus Pricing:** Cost + Profit Margin = Selling Price

The main difference between traditional and the target costing is that target costing uses price driven costing approach while traditional costing follows cost driven pricing. The traditional costing concept is that production cost of a product is identified first then after the development of product, selling price is set. However, in target costing a selling price and desired profit are determined first then product is developed. The traditional cost plus approach is out of date and target costing is suitable in today’s uncertain business environment. The difference between traditional costing and target costing are shown in the following figure.

![Figure 3.1.8: Cost with added markup or traditional costing versus target costing](image)

**Source:** Adapted from Rybkowski (2009)

The conventional cost plus approach represents as a “closed costing system” while target costing represents as an “open costing system” (Ansari & Bell, 1997). Cost plus method is still popular in many firms although it has some criticisms. This method is popular in firms because it is easy to calculate, it requires minimal market information and research. Kaplan & Cooper (1998) argued that cost plus system is ineffective for feedback or correct information or lateness of its reporting, less control, poor selection of cost drivers etc. When this method is compared with target costing then some differences can be
identified. From previous studies the general differences between target costing and cost plus pricing approach are summarized as under:

- Traditional costing method first design product and then find out cost of product while in target costing the target cost is placed first and then product is designed in order to achieve the target cost.
- Market consideration is not important as a part of cost planning in cost plus pricing approach while target costing considers competitive market to drive cost planning.
- Costs determine price in cost plus pricing method while prices determine costs in target costing method.
- Design is key of cost reduction in target costing but cost plus pricing method ignores the design of product.
- Cost accountants are responsible for cost control in cost plus pricing method while target costing works with cross functional teams to manage costs.
- Suppliers are involved in cost plus pricing method after products design stage. It shows low involvement of supply chain members in traditional method while suppliers are involved from beginning stage of product development in target costing, it shows high involvement of supply chain members in target costing.
- Through the use of target costing company can reveal its internal operations which may be hidden in traditional costing methods.
- Target costing referred as price-led costing method and traditional costing method referred as cost led pricing.
- In traditional approach prices are based on the earlier steps in the process and when cost increases prices are frequently raised to maintain profit margins. But target costing concentrates on the target cost not on increase the selling price of product to maintain profit level.
- Target costing establish target selling price according to customers, market needs and competition while traditional costing does not give much importance to customers, market needs and competition.
- Target costing use value engineering, quality function deployment and other tools to attain target cost but traditional costing does not include such tools.
• In traditional costing method cost reduction if required according to consumers and conditions then for cost reduction steps are taken after the start of production while target costing focuses on product design and process before start of production to reduce costs or costs are managed before they are incurred.
• Target costing method focuses on long run cost management while traditional costing focuses on short run cost management.
• In traditional costing co-operation between marketers and engineers is minimum because engineers develop a product and the marketing department sell the product while target costing involve every department for the design and development of product.

3.1.12 ENABLERS OF TARGET COSTING IMPLEMENTATION

The tools that help in smooth functioning of target costing are known as enablers of target costing. The success of target costing process depends on its right tools. Ansari & Bell (1997) described target costing core tools that are used during the product development process. There are many tools that can be used in target costing. The major tools/techniques that most commonly used or mentioned in literature of target costing are value engineering, quality function development and design to cost & manufacturing. The following figure is demonstrated the link between enablers of target costing and its functioning.
3.1.12.1 VALUE ENGINEERING

Value engineering is a tool which is being used by Japanese producers to enhance the value of products and to attain the target cost. Sakurai (1989) defined value engineering as a tool of designing a product from various aspects but always with the aim of reducing costs and providing the customers what they wants. The value engineering method is just like activity analysis and it was first developed by General Electric. This tool is used by Japanese firms to assist in getting the objectives of target costing. Value engineering is the central and essential part of the target costing process without it target costing is not possible (Monden, 1995). A reduction in cost without decreasing the functionality is called value engineering (Ansari & Bell, 1997).

Value engineering helps in reducing costs of product (Cooper & Slagmulder, 1997). Value engineering is used to identify product features or attributes that are not cost efficient. Gagne & Discenza (1993) pointed out that the starting point of value engineering is to check the functions of product in order to reduce the cost and to improve the product. The value engineering tool describes the functions of product and quantifying the elements of those functions. The value engineering tool is used at the second stage of target costing. This tool is customer oriented and focuses on maximize the value or functions of the product for customers. The job plan is used in value engineering at workshops. Application of value engineering ensures total savings through product functionalities.

Monden (1995) defined value engineering as “Organized effort to implement functional analysis of products and/or services to reliably achieve all required functions at the lowest possible life cycle cost”.

Cooper & Slagmulder (1997) defined “value engineering is a systematic, interdisciplinary examination of factors affecting the cost of a product so as to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost”.

Figure 3.1.9: Target costing and its tools

Source: Adapted from Theuvsen et al. (2005)
The primary goal of value engineering is to enhance the value of product. Here value is the ratio of functionality of a product and cost of product and it can be measured as under:

\[ \text{Value of product} = \frac{\text{Functionality or Qualities of Product}}{\text{Cost of Product}} \]

Value engineering is the main tool in the process of achieving the target cost. According to Sakurai (1989) value engineering is used in different ways in different companies. Value engineering is a tool to design product with reviewing the functions of product at a lower cost. Successful use of value engineering depends on the degree of creative thinking. By elimination and modification of unnecessary functions or features, it increases the value of product for customers. The value engineering is a tool which is used by Japanese manufacturers to enhance product value on the basis of relationship between the functions and costs incurred. The process of value engineering consists determination of the functions of each product. The value engineering tool is used to determine the cost reduction by focusing first the product functions then the cost of product (Cooper & Slagmulder, 1997). This tool compares the importance level of every element or component or function to its cost. The value engineering tool is continued until the target cost is achieved by increase the value of important functions and reduce the less important functions.

### 3.1.12.2 QUALITY FUNCTION DEPLOYMENT

The quality function deployment method was introduced by Yoji Akao in 1966 in Japan now this is very successful method. The quality function deployment is used at the first stage of target costing. The quality function deployment method relates product functions to customer needs to establish product design. It correlates the customer attributes with the features or components of product. The quality function deployment is an instrument to transform the customer requirements into technical features of a product or service.

Akao (1990) defined quality function deployment as “a method for developing a design quality aimed at satisfying the customer and translating the consumers demand into design targets and major quality assurance points to be used throughout the production phase”.
Sullivan (1986) defined quality function deployment as “a method that helps a manufacturing company to bring new products to the market sooner than competition with lower cost and improved quality”.

This tool can be used to conduct quality control activities and to design product or services by both manufacturing and service industry (Akao, 1990). This tool is also known as voice of customer. This tool mainly includes comparison with competitor’s performance regarding product and quality characteristics of product which are new for customers but quality characteristics which are not according to customers are replaced with other appropriate functions. The quality function deployment provides information which play a key role in target costing process. It includes customer requirements together with the expected values by the customer and by comparison with competitor’s products.

3.1.12.3 DESIGN FOR MANUFACTURING ASSEMBLY

Design to cost and manufacturing is a product development philosophy and a tool of target costing to reduce production costs during early the design stage by improving the manufacturing processes. It is based on the principle that the customers establish perceived value for goods and services and the manufacturer must develop, manufacture and market that product at a price not to exceed that perceived value (Annacchino, 2003). In the design to cost and manufacturing philosophy market price of product is estimated according to the function and value of the product. The estimated market price and decided target profit margin limit the manufacturing cost of product while traditional cost plus process decides market price at end. Design to cost and manufacturing is not customer oriented like value engineering it attempts to minimize the cost by taking the cost as a constraint (Ansari & Bell, 1997).

It is also known as design for manufacturing and assembling. According to Ansari & Bell (1997) design for manufacturing and assembling refers to engineering processes design to optimize the relationship between materials, parts and reduce time to market by making it easier to manufacture or assemble parts or to eliminate them. The goal of design for manufacturing and assembling tool is convenient production at low cost. According to Miyazawa (1993), the process of design for manufacturing and assembling system has
four steps: (1) designers select specific parts and assembling sequence, (2) pre-existing guidelines are used for timely production or to evaluate time and ease of assembly, (3) parts are reduced with improvement or ease of assembly and (4) design is reviewed beside prior design. The design and development team thinks about the production process under this method. Design for manufacturing and assembly examines the effectiveness of the design and assembly operations. The main aim of this tool is to simplify the assembly processes with fewer errors and reliability of the product.

3.1.13 PRINCIPLES OF TARGET COSTING

Most costs are covered under product and process design decisions and after start of production it may be difficult to reduce costs. Thus, product designs, material choices and investment decisions need to be thought before product design and development decisions are finalized. Target costing is based on some straight forward principles and all principles must be followed for successful implementation of target costing. The effective use and proper implementation of target costing demands its fundamental principles and all its principles are required to be adopted to take full benefits of target costing (Ansari & Bell, 1997). According to Ansari & Bell (1997) target costing contains six key principles that build its foundation and these principles are:

(1). Price Led Costing

This principle basically captures the thought that price setting should be based on product costs. This is because price is controlled by market. Product price is based on the competitive market. The market prices are used to find out the allowable costs. Price led costing principle includes product and profit plans which are decided by market prices and active competitive analysis for understanding market prices (Ansari & Bell, 1997). Market driven management is mainly concerned with market or customer requirements. Target-costing system sets target costs of product by subtracting the desired profit margin from the market price.

(2). Customer Driven

According to Ansari & Bell (1997) target costing is market driven thus the views of customers are very importance and must be taken into account throughout the whole target costing process. This principle ensures customer input and it is based on the
assumption that customer will neither buy a product which is not according to their needs nor pay more for a sub standard product. The target costing is a market oriented or market driven pricing method and it gives more importance to the market performance. The customer requirement regarding the quality, price and timeliness are simultaneously included in product and process decisions and this principle guides cost analysis. Customers expectations and competitors actual performance are essential in target costing application. The value of product regarding features and functionalities perceived by customers must be greater than the cost of product.

(3). Focus on Design
Target costing focuses the design of a product and the production process for cost reduction. Majority of costs are committed during design and development stages of product and target costing also spends time during these stages (Ansari & Bell, 1997). The design stage includes design of the product, their production process and the delivery process at the same time. The cost reduction process during design stage takes place to re-engineer the product design. Engineers are challenged to examine design process and use of technology for customer value. The engineering changes take place before production begins for lower costs and reduced time to enter in market. This principle states that product design stage takes place before production begins and focus on this stage can give more cost reduction and right time introduction of new products. Thus, this principle believes that before product and process are finally designed costs of product must be focused.

(4). Cross-Functional Teams
Cross functional team refers as the interaction of the different departments. Cross-functional product and process teams include the members from different departments such as design, manufacturing, purchasing, engineering, sales, research & development, cost accounting and marketing departments in the design and development process stages of the product. The cross-functional teams are responsible from the initial concept of product to the end or final product (Ansari & Bell, 1997). Finance department helps in the assignment of cost targets, engineering helps in using techniques like value engineering to save costs, purchasing works with suppliers for parts and components, manufacturing helps in improvements of manufacturing processes, sales department in
the distribution of products etc. The cross functional teams participation early in design and development phase greatly affect product life cycle costs. For the application of target costing a company has to motivate the multidisciplinary teams. These cross functional teams develop new ideas for the product but these teams require a supportive environment. Supportive environment encourages good channels of communication and free flow of information across the entire company.

(5). Life Cycle Orientation

This principal states that target costing considers full cost of a product over the entire product life cycle from inception to abandonment of the product not only the manufacturing costs. Product life cycle includes costs such as raw material purchase price, research & development costs, operating costs, maintenance, distribution costs, disposal, installation and repairs costs (Ansari & Bell, 1997). The goal is to minimize the cost of the product for customers as well as for producers. This determines whether sufficient profits are being achieved to cover all product life cycle costs.

(6). Value Chain

This principles states that target costing is an integrated strategic management system which includes supply chain partners. This principle states that an established relationship is required among all members of supply chain. The development of a cooperative relationship among all members of the supply chain maximize cost reduction efforts. The long term relationship are beneficial to all parties. Target costing process includes all members of the supply chain of the company such as supplier, dealers, distributors, service providers, customers and support personnel (Ansari & Bell, 1997). This method is based on an active and collaborative relationship between supply chain partners where all members of the chain contribute in cost reduction. The value chain integration enables a coordinated and collective thinking to solve industry level issues. It develops the way of communication throughout the supply chain. Swenson et al. (2003) stated that in addition to internal operations companies also involve supply chain partners to meet cost targets. With supply chain partners companies can share design and cost information to meet their goals. Target costing gives valuable strategic and competitive benefits to all participants of supply chain. Effective application of target costing in firms needs cooperative and good relationships with both customers and suppliers.
3.1.14 TARGET COSTING AND STRATEGY

In simple way strategy can be defined as a plan or set of rules required to adjust uncertain future circumstances and includes actions according to the situations. Top level managers or groups of managers play important role in strategy creation. Cooper (1996) stated that effective systems of cost management are developed to face changing competitive conditions. Companies can no longer maintain their condition or sustain competitive advantage by pursuing cost leadership or differentiation strategies. In low cost strategy or cost leadership strategy companies try to be the lowest cost producer without focusing quality of product while in differentiation strategy companies strive to manufacture high quality and functionality products for high income group persons without focusing cost of product. Under low competitive environment non-confrontational strategies, cost leadership and product differentiation can be successful. Hence, companies have moved to use new strategy in competitive environment which is ‘confrontation strategy’ (Cooper, 1996). The companies who apply a confrontation strategy do not avoid competition. The basic idea of confrontation strategy is that firms have to compete under ‘survival triplet’ concept.

The competitive strategy of firm is closely linked to its adoption of target costing (Ansari & Bell, 1997). Target costing is a strategic management accounting tool (Ewert & Ernst, 1999). Cooper & Slagmulder (1997) described that target costing is directly related with the organization’s competitive strategy. The confrontational strategy is about three key competitive areas quality, functionality and price. Confrontation management thinking emerged during late 20th century as a result of increasing modern day competition. It is a strategy through which firms can operate internationally against competition. Companies that adopt this strategy can develop product at low cost, high quality and functionality. This is a competitive strategy because the firm that fails to reduce cost with rapidly changing environment and competitors will notice that its profit margin are being squeezed and its existence is in danger. The three product feature or survival triplet play a critical role for the survival of firms under confrontation strategy. The confrontational competition strategy demands the integration of cost, quality and functionality and these should be applied consistently to meet the perfect quality and functionality at the perfect price. The confrontational strategy requires the integration of price, quality and
functionality and this integration can enable a firm to respond rapidly the market competition (Cooper & Slagmulder, 1997). Some previous studies interpret confrontation as a strategy of producing a cheaper product with quickest introduction and supply. This is difficult to work according this strategy therefore a company should have a strong learning culture. Low cost leadership strategy and product differentiation strategy are used with target costing because these are the parts of confrontation strategy to take sustainable competitive advantage during uncertainty. Companies cannot ignore product quality to produce product at the lowest possible cost. Confrontation strategy is based on the assumption that competition in market is not avoidable and this strategy is best suitable in the environment of high competition. The strategy selected by the organization is influenced by the pressure of competition and this pressure is not similar for every firm. Non confrontational strategies such as differentiation and cost leadership are suitable in the environment of less intensity of competition.

3.1.15 THREE LEVELS OF TARGET COSTING PROCESS

The target costing process focuses on cost reduction or attainment of target cost without sacrificing functionality, value and quality of product. Target costing process is human-based thus it depends on personnel or members intelligence and creativeness. The target costing process is different according to different authors. Cooper & Slagmulder (1997) described three main levels of target costing process as: (1) Market driven costing, (2) Product level target costing and (3) Component-level target costing. The following figure shows the sequence of three phases of target costing.
**Figure 3.1.10:** Three levels of target costing

**Source:** Adapted from Cooper & Slagmulder (1997)

The general process of target costing is broadly divided into these three steps. This elaboration is mainly suitable for construction industry. The general target costing process may be applied for different products and services industries. The target costing process starts with establishment of a target cost for a new product. A cost estimating or cross functional group decomposes the target cost for individual components or parts. Frequently, a gap would exist between the target cost and cost projections for the new product based on current designs and manufacturing capabilities. Central part of target costing process is finishing the gap between target cost and actual cost through product’s design and manufacturing processes. These three phases of target costing are interrelated and first level provides as well as take some information from second level, similarly second level provides as well as take some information from third level. This is demonstrated in the following figure.

**Figure 3.1.11:** Relationship between three levels of target costing

**Source:** Adapted from Cooper & Slagmulder (1999)

### 3.1.15.1 MARKET DRIVEN TARGET COSTING

In this phase of target costing “allowable cost” is introduced. Allowable cost is that cost at which product must be produced to take desired profit. This cost is based on the customer expectations. The target selling price is expected by the market and it is decided after functionality and quality analysis. Target profit margin is expected by the firm and it must cover the cost of
product. In target costing process main part is attainment of target cost which is the gap between the allowable cost and expected cost. Once the allowable cost for a new product is set the first level of target costing process is completed which is called market-driven costing (Cooper & Slagmulder, 1997). Finally Cooper & Slagmulder (1997) includes following five steps in market driven costing process.

(1). Decide long-term sales and profit objectives
(2). Constitution of the product lines
(3). Set the target selling price of product
(4). Establish the target profit margin
(5). Determine the allowable cost

These five steps of market driven costing are explained through following figure.

![Figure 3.1.12: Market driven target costing for a single product](image)

Source: Adapted from Cooper & Slagmulder (1997)

Cooper & Slagmulder (1997) stated that nature of the customers and intensity of competition are two major factors that affect market driven costing and these factors help in collecting information about market, customers, competitors and ensuring the
problems about the new product. According to Cooper & Slagmulder (1997) following factors influence market driven costing.

- **Intensity of competition**: Number of competitors in market.
- **Degree of customer sophistication**: Sophisticated customers are those customers who are highly knowledgeable about available product offerings and they can detect minor differences between competitive products. Target costing is beneficial in the environment of more sophisticated customers (Cooper & Slagmulder, 1997).
- **Rate of customer requirements change**: Customer expectations lead product’s design modification and the requirement of new products to increase probability of success. This happens mainly in automobile industry. Target costing is more suitable in the environment where preference of customers change rapidly (Cooper & Slagmulder, 1997).
- **Degree of understanding the future product requirements of customer**: Companies pay more attention for those consumers who have less knowledge regarding their future product requirements. Target costing is less beneficial in such market where there is complexity in predicting future customer requirements (Cooper & Slagmulder, 1997).

### 3.1.15.2 PRODUCT LEVEL TARGET COSTING

In this step, product level target cost is determined and this cost is achievable due to the product designers considerable efforts and creativity. This is related with product level cost management and it includes product strategy and the uniqueness of the product. Based on the firm’s conditions and capabilities the target cost can be less than or equal to the allowable cost. The current cost is the actual cost of product without using any improvement or cost control technique. In this phase the excess cost over current cost is reduced, with the help of value engineering. Target cost attainment is a strategic cost reduction challenge. If the actual cost exceeds the target cost of product then actions are taken to reduce that cost. Manufacturing costs can be decreased by taking various actions like re-engineer the manufacturing process. In product level target costing step, product designers find new ways of developing product at target cost to satisfy customers.
(Cooper & Slagmulder, 1997). The target cost of product is determined at that level, where company can sensibly expect to achieve the target cost with its and suppliers capabilities. The cardinal rule of target costing follows discipline throughout the product design process (Cooper & Slagmulder, 1997). Finally the process of product level target costing has following steps.

(1). **Set target cost of product:**
It is determined as the gap between allowable cost and expected cost of product.

(2). **Discipline the process:**
When company has established target cost of product. This step follows designing the product at target cost and chief design engineer checks the progress toward achieving the target cost.

(3). **Achieve the target cost:**
If target cost is achieved then next step is manufacturing product carefully but products those costs exceed their target costs are not launched.

Cooper & Slagmulder (1997) pointed out that two major factors product strategy and characteristics of the product influence the product level target costing and these factors help in collecting and determining information regarding the trend of historical cost and customer requirements. The steps of product level target costing are explained through following figure.

**Figure 3.1.13: Product level target costing**

*Source: Adapted from Cooper & Slagmulder (1997)*
According to Cooper & Slagmulder (1997) following factors influence product level target costing.

- **Product strategy**: Number of products in the product line, the frequency of redesign of product and the level of innovation are considered under product strategy. Target costing is more beneficial in case of high rate of product innovation (Cooper & Slagmulder, 1997).

- **Product complexity**: It determines the problems in managing the process of product design. Product complexity is effected by factors such as the number of components of the product, production process, difficulty of manufacturing product components and the variety of technologies required for the production of the product (Cooper & Slagmulder, 1997). Target costing is more beneficial where product complexity increases (Cooper & Slagmulder, 1997).

- **Product development duration**: It refers time required for the product development from its conception stage to its final stage of production. Cooper & Slagmulder (1997) noted that target costing is more beneficial for the longer product development cycle products.

- **Magnitude of investments**: It includes production start up, launching and research & development costs. Target costing is more suitable for high investment products (Cooper & Slagmulder, 1997).

### 3.1.15.3 COMPONENT LEVEL TARGET COSTING

In this step, total target cost is divided into target costs for product components. After the accomplishment of second phase component level target costing starts. In this phase the components of product are examined. The input from suppliers and construction process are included under this level. After the establishment of the target cost of product, target cost for the suppliers of company is decided. Cooper & Slagmulder (1997) called this step ‘component-level’ costing. Therefore, transmitting the cost pressure of product to the suppliers is very important for firms. Relations with supplier are extremely critical for the success of the company.

Cost and quality of items provided by the suppliers are two very important factors in the selection of suppliers. This phase handles the costs associated with components of
product. It includes the cost of the components and cost of these components are charged by suppliers. Firms that depends on imported raw materials must have flexible supplier based strategy. Cost reduction is done when it is allocated across the component level. Component level target costing is the last step. It is estimated that the suppliers of the company find ways to provide components or parts of product at their target costs (Cooper & Slagmulder, 1997). Thus, this level of target costing focuses on the significant ideas given by the suppliers for the design and technology changes, for the final production of the product. According to Cooper & Slagmulder (1997) following four steps are in the process of component level target costing.

(1). **Decompose target costs of major functions:**
The product design teams identify key functions of product. Functions are related with the performance of product. These teams are responsible for every key function of product and the team involves persons from product design, engineering, manufacturing and purchasing departments. The first step is the use of components historical cost as the starting point for determination of the component level target costs of new products.

(2). **Set target costs of components:**
Chief engineer after negotiation about product design with product design team members sets target cost of each major function then total target cost is decomposed for appropriate components of product (Cooper & Slagmulder, 1997). Components are mainly related with the parts of product and target cost of component depends on factors like its need, nature etc.

(3). **Select suppliers:**
The step is related with the selection of suppliers for different product components. Selection process of suppliers starts with the quotation price given by suppliers to provide product. The quoted prices of product given by suppliers are compared with components level target costs. If quoted prices are satisfactory then company selects suppliers otherwise further negotiations are made by company. The selection of suppliers is often based on their competitive bids, reputation in market and their degree of innovation.

(4). **Reward supplier creativity:**
To motivate suppliers companies use incentive plans. To enable suppliers efficient and innovative companies should manage their suppliers actively. This step is related with
maintaining supplier relations and motivate suppliers to increase their creativity. Target costing can be applied in proper manner with cooperation and long-term supplier relations.

In this regard, figure 3.1.14 is depicted the process of component level target costing.

**Figure 3.1.14:** Component level target costing

**Source:** Adapted from Cooper & Slagmulder (1997)

According to Cooper & Slagmulder (1997) following factors influence the component level target costing.

- Supplier base strategy
- Power or control over suppliers
- Supplier creativity
- Degree of integration with suppliers and departments
- Co-operative relation between firm and suppliers

### 3.1.16 FACTORS AFFECTING TARGET COSTING APPLICATION

Sales price is market driven therefore it is non controllable but product costs are controllable because costs are set internally. Tani (1995) argued that environmental uncertainty influences target costing. Environmental uncertainty is governed by the occurrence of technological innovation, market competition intensity and the diversification of customer requirements. The target costing process looks easy and straightforward to implement but its implementation requires a different mindset (Feil et al., 2004). Literature on target costing describes that this method is mainly adopted for
the assembled products such as coffee makers, computers, automobiles etc. Assembled products are those products that have limited interrelated components at their performance level. Target costing is a part of a total cost management mainly for manufacturing companies. When target costing properly applied then it gives best results of cost management strategy. Hence, target costing is a strategy which is applied in definite conditions. When product is sale to direct user and customers expectations change rapidly then target costing is effective. In contrast when buyers are not direct users and there are less changes then target costing can also be beneficial. Thus, in those situations where consumer preference change rapidly or higher the rate of fresh/new product introduction target costing is useful. Target costing becomes more significant in the situation of high product complexity (Cooper & Slagmulder, 1997). As the length of product development process increases it becomes essential to apply target costing method. The more power and relation of the firm has with its suppliers also affect the use of target costing. Based on previous studies the successful implementation of target costing is influenced by the following factors:

(1) Top Management Leadership
According to Ansari & Bell (1997) implementation of target costing requires responsive spirit of employees for efficient operations and improvement in the firm. This is possible only when top management is involved in this process and they can build and encourage employees to find out the areas of their weaknesses requiring improvement.

(2) Team Orientation
Target costing needs cross functional team involvement and it is one main factor of target costing successful implementation. In Japanese companies employees prefer groups working than individual working because they feel added advantage in groups and they are more comfortable in groups than separation. Decisions after group debate are considered more effective and vital.

(3) Japanese Management Accounting System
Japanese management accounting system uses more information for strategic decisions not only for financial issues (Feil et al., 2004). This enables members to be market oriented and think strategically. Quick communication of financial and non financial
information among employees help them to understand their own performance and performance of their departments.

(4) Trust
Trust between all members of company is essential for target costing successful implementation. It is essential for each member like employees, management, engineers and suppliers to understand and depend on each other. This can provide important knowledge about market conditions to organization. One example of such trust in Japanese firms is that lifetime employment facilities are common there. The loyalty and trust connect employees with the organization and they work with their own interest at all times to make the firm successful.

(5) Commitment to Work
Trust between the organization and workers is necessary, still a strong commitment to work of members is vital. Studies show that in Japanese companies employees work with commitment and willingness for long time.

(6) Education
Japanese companies workers take interest in learning. Japanese companies always increase their employees knowledge through training and job rotation (Feil et al., 2004). By focusing comprehensive education authorities and employees working in the company can understand well implementation of target costing. Target costing successful implementation fails when management and shop floor employees do not know and cannot understand the working philosophy of costing techniques and strategies of their organization (Ansari & Bell, 1997).

(7) Business Association
Business association is a structure that is used by Japanese firms to develop a link between product parts makers. The companies work together or supply chain members and their strategic networks link organizations to resources and help in cost reduction (Feil et al., 2004). The cooperative integration with suppliers ensures the fluent flow of required resources from one supply chain partner to other.

(8) Information Network
The successful implementation of target costing also depends on the good information network that exists between supply chain members mainly customers and suppliers (Feil
et al., 2004). This may flow the market information and suggestions to improve the product. The predetermined target cost should be clearly communicated in each department. It raises need for continuous feedback. The performance appraisal is necessary to know the achieved level of target cost. In case of gap, performance appraisal is necessary to know the responsible person. When relevant and accurate information are collected and shared among functions, across product teams then it may lead excellent work. Firms that have adopted target costing there information flow smoothly among different team members and departments (Kato et al., 1995).

3.1.17 IMPLEMENTATION OF TARGET COSTING

Japan was in trouble in 1930s after the second World War so they worked on new thinking target costing. Today Western firms are also slowly introducing target costing for their product development processes because currently fierce competition exists in market. Target-costing has been successfully applied in assembly and process industries. According to Cooper & Slagmulder (1997) target costing is an effective tool for both direct cost like material and labour and indirect costs like overhead costs reduction during product development stage. Target-costing has been applied by Japanese major manufacturing companies like Nissan Motor Company, Toyota Motor Corporation, Sony Corporation and in other countries many market leaders such as Kodak, Boeing, Mercedes, Chrysler and Goodyear (Kato, 1993). Target costing was being used by 100% of Japanese car manufacturers and 80% of Japanese assembly firms, but only 40% of firms in the USA use target costing (Helms et al., 2005). However, only 30% of European firms were being applied target costing (Ansari et al., 2007).

Ellram (2000) reported that automotive, electronic equipment, computer peripheral and consumer products manufacturers are using target costing method. Many previous studies reported that mostly target-costing is applied during the early stages of product development though the principles of this method can also be applied at a later stage but this method rarely applied at later phase of product life cycle. Cooper (1994) identified that target costing method is used for the manufacturing activities only. Fisher (1995) found target costing focuses only production costs. In the motor industry there are high frequency of changes thus target costing is suitable in that industry. Tani et al. (1994)
found 59% application rate of target costing. Dekker & Smith (2003) found 59.4% Dutch listed manufacturing firms were using target costing. It is observed that target costing has been adopted worldwide by mainly car or automobile manufacturers to improve quality, processes and inventory holdings. Target costing has many advantages and weaknesses still it is attractive because its weaknesses are easy to correct than other costing methods. According to previous studies target costing method is more suitable for some companies which are covered as: (1) Assembly oriented industries as contrast to repetitive process industries which produce uniform products and (2) Heavy products industries with the diversification of product lines. Target costing is applied at a low rate in the service sector because the nature of industry cannot be fully matched with target costing. Kato (1993) revealed that more than 80% companies in assembly oriented industries were applying target costing in Japan. Literature says that big companies have implemented target costing and there is low rate of its implementation in small scale industries. Sakurai (1989) mentioned that increased consumer demand and shortening of product life cycle were the reasons for the application of target costing in Japan.

3.1.18 EMPLOYEES INVOLVEMENT

Target costing is adopted as a philosophy that has gained recognition due to the need to produce a product at a pre decided cost level. This method is used with the help of team not to control employees and teams. In target costing process top management and all remaining employees are important (Ansari & Bell, 1997). Typically there are four main teams in a manufacturing process of product: the business planning team, the product team, the design team and the product manufacturing team (Ansari & Bell, 1997). The effectiveness of this method usually increases with the involvement of personnel. The members of team should be trained to apply the target costing process. This system motivates employees think and act strategically. Multidisciplinary teams are crucial (Cooper & Slagmulder, 1997). These teams play very important role in achieving cost/price, quality and functionality objectives. Without these teams shop floor workers commit no cost reduction. Target costing process focuses designing the new products and cross functional teams to assess the possible design alternatives. Commitment of workers towards task require trust and respect among team members. Support of all employees is
vital for target costing. Kato et al. (1995) supported cross functional teams and they use the term “people involvement”. An integrated and skilled product development team having members from different departments can satisfy the requirements of market (Butscher & Laker, 2000). These teams and their outputs are shown in following table.

<table>
<thead>
<tr>
<th>Team</th>
<th>Membership</th>
<th>Major Team Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business planning team</td>
<td>Senior executives from all major functions including program managers</td>
<td>Long-term strategic plan, core competencies and key technologies, product strategy and plans, deployment plan</td>
</tr>
<tr>
<td>Product team</td>
<td>Product team program manager, sales and marketing (including international), product planning, manufacturing; cost analyst, procurement, key suppliers</td>
<td>Product level profit plans, product concept, product feasibility, value engineering (VE), cost targets, capacity and investments plan</td>
</tr>
<tr>
<td>Design team</td>
<td>Design engineering, prototype development, product planning, manufacturing, cost analyst, procurement, key suppliers, service and support; sales/marketing/distribution</td>
<td>Product concept; VE, detailed product and process design, validated product and process</td>
</tr>
<tr>
<td>Product manufacturing team</td>
<td>Design engineering, plant manufacturing, quality control, cost analyst, procurement, key suppliers, service and support; sales/marketing/distribution</td>
<td>Production plan, capacity requirements, final make/buy decisions, training on new processes, supplier management, continuous improvement</td>
</tr>
</tbody>
</table>

**Table 3.1.2:** Teams and their output

**Source:** Adapted from Ansari & Bell (1997)

Kato et al. (1995) presented some common importance of cross functional teams for target costing. Cross functional team members are from different departments and all worked together for smooth functioning of target costing. Active support of upper level management, empowered cross functional teams and internal reward structure are important elements for the success of target costing. Cross functional cooperation is also important for strategy formulation process. Team members often negotiate to set the level of target costs but there negotiation is not seen as bargaining. There negotiation is the rationality of the team members and it motivates employees in positive way with their commitment to achieve assigned targets. Cross functional team is answerable for the entire life cost management of product. The target costing method decides cost objectives and goals for teams and it is the base of their performance measurement. Target costing
can achieve its goal with the participation of all departments and these departments helps in different ways such as:

- Accountants give advice on appropriate pricing strategies.
- Economists helps in deciding rules and criteria for maximizing profits.
- Marketing executives focus on the different consumer and ideas of market segmentation.
- Research and development department helps to improve design, development and innovation for product.
- Engineering department focuses on cost reduction ideas without sacrificing the quality of the future product.
- The production or manufacturing department plays role in material flow, elimination of unnecessary inventory and reduced setup times etc.

Target costing process requires the involvement of different departments employees of the organization. Different departments perform in different ways in target costing process for the attainment of target costs. For full involvement and commitment of all levels employees in target costing following points can be focused by firms.

- Their roles must be clear.
- The evaluation criteria/basis must be clearly communicated.
- Responsibilities must be properly assigned.
- Employees should know and understand both goals and motives.
- The creation of cross functional teams.
- Integration of areas experts in cross-functional team.
- Association between members facilitates future revisions and improvement of the product.
- No information gap between members to work efficiently.
- The personnel must be responsible regarding their work to keep them rationalized in their functional areas.

### 3.2.1 KAIZEN PHILOSOPHY
The term kaizen is originated by the Japanese companies for continuous improvement. According to Barnes (1996) the Japanese word kaizen is a composition of the words kai and zen where kai, means “change” and zen, means “good or better” and can be translated as improvement. The popular meaning of kaizen is continual incremental improvement in all aspects of a company. Kaizen is a Japanese word meaning gradual, orderly, continual improvement or change for better. The kaizen concept involves everyone in an organization working together to make incremental improvements without large capital investment. The well known proponent of the kaizen concept provides descriptions of kaizen in Japan (Imai, 1986; Imai, 1997). Imai (1986) defined kaizen as continuing improvement in personal life, home life, social life, work like and when it is applied to the workplace kaizen means continuing improvement involving everyone from top managers to workers. In business culture and management process the term kaizen refers for continual and gradual improvement. Literature indicated that because the elimination of waste is the main objective of lean thinking the instrument for conducting constant search for waste at all levels by all workers and throughout the work area is kaizen (Imai, 1986; Wittenberg, 1994). The kaizen approach is not only about doing things better, but getting specific outcomes. Kaizen concept focuses on Muda (productive loss) for eliminating waste and these wastes can be waiting time for material or delays in delivery, defects, inappropriate processes, excessive materials, idle time of workers, over and under production etc. Kaizen is usually incremental in nature in contrast to major technological innovation for example the installation of new technology or machines and kaizen is participative entailing the involvement, experience and intelligence of the work force, generating workers attitude and quality of work life benefits for employees.

Kaizen was a main turning movement in business. In Japanese the companies who have adopted kaizen method give importance to their employees as a whole person, not simply as a serviceable resource. Employees and teams knowledge, participation and their contribution in every aspect of business improve workplace and products. The workforce becomes stimulated and motivated and produces results greater than the work of total individual members contributions. In kaizen approach progress is achieved by constant small changes, associated with the ideas downstream given by shop floor workers to the point of sale, even after-sales services and ideas regarding their works. In this concept
there is no perfection or status quo consideration and it is based on the thinking that perfect product can never be attainable at any day or another person may find the way of improvement. Kaizen refers outputs as “standards” or “quotas” rather than targets because standards promote efforts to beat targets and targets can be met (Barnes, 1996; Drury, 2008). Barnes (1996) stated that to implement total quality management it is necessary to understand kaizen concept.

Kaizen is continuous improvement technique which involves group leaders, managers and shop floor workers to achieve the goal of waste reduction. Further, the literature decomposes the concept by considering two areas: first the degree to which the processes of kaizen are systematized and second the degree to which top managers specify the theme of kaizen activities. Main activities associated with kaizen are zero defects, involvement of management and employees, and suggestions. Zero defects refer to the actions associated with the adoption of a zero defect mindset in the company in which employees autonomously improve things. Suggestions refer to the operation of suggestion schemes and suggestion team which may potentially act upon employees suggestions and the suggestions are determined by the particular encouragement of the employees. Involvement refers (1) support of top management by policy deployment and it refers to the process by which senior management promotes targets and agendas throughout the organization and (2) small group activities (SGAs) are those activities which are smaller and distinguished one and these constitute the main portion in kaizen concept. Various authors described different features of kaizen but they mainly focus on key feature: kaizen is continuous, means it is used to signify both the nature of the work and it is a never-ending journey towards quality and efficiency. Melnyk et al. (1998) discussed seven characteristics that distinguish kaizen approach from other process improvement approaches.

i. Kaizen includes small-small activities of employees which are known kaizen activities and kaizen events. A kaizen event is a self contained short run intervention (commonly for three to five days) with a clearly defined life.

ii. The scope or area of a kaizen event is focused on part of a specific value stream.

iii. Kaizen events are low capital interventions means kaizen activities do not require high funds. Events generally have no budget for capital equipments or big assets
and the focus of a kaizen event is mainly on improving existing processes rather than implementing solutions that require high investment in new technologies.

iv. Kaizen events are team-based activities that comprise employees from the targeted or specific work area and including support functions of engineering, purchasing and production control. Kaizen events make use of employees experience and knowledge to develop better solutions.

v. Kaizen events are action oriented and kaizen teams are often given sufficient authority to implement solutions because ideas are developed by employees therefore without additional direct approval from top management they implement them.

vi. Kaizen events goals are measurable. Common measurement includes productivity, work-in-process, parts travel time, lead time, setup time, on time delivery percentage, defect rate and product design measures like price and product line diversity.

vii. Kaizen events are considered for continuous improvement to achieve high level of performance improvement within a particular process in organization.

Process of kaizen events is shown in the following figure.

**Figure 3.2.1:** Kaizen event cycle
3.2.2 BASIC ELEMENTS OF KAIZEN APPROACH

The way of thinking named kaizen as well as “Japanese style of quality management” became an object of interest of western companies when Japanese economy had achieved success in 1980s (Karkoszka & Honorowicz, 2009). It also needs small-groups activities as informal, voluntary, intercompany groups based on kaizen-minded and self-disciplined employees (Karkoszka & Honorowicz, 2009). Kaizen concept has two main elements, first is 5S and second is PDCA (plan, do, check and act) cycle and kaizen philosophy works around these concepts.

3.2.2.1 5 S – FRAMEWORK OF GOOD MAINTENANCE

In Japanese, 5S is the short form of five words which present the concept of good maintenance (Aurel et al., 2010). The basis of kaizen are constituted by 5s concept, defined by Japanese specialists as a set of good customs and manners (Karkoszka & Honorowicz, 2009).

![KAIZEN 5S Diagram]

**Seiri (Sort)**: It refers making the difference between necessary and useless things and giving up the useless ones (Aurel et al., 2010). It represents
proper preparation of a workplace, manner and instrument of work with the elimination of everything useless (Karkoszka & Honorowicz, 2009).

- **Seiton (ordering /arrangement / systematic):** It refers the ordering of all the items after sorting (Aurel et al., 2010). It is tidiness in a workplace and preparation of every required tool in the manner enabling simple and quickly utilisation (Karkoszka & Honorowicz, 2009).

- **Seiso (cleanness / cleaning and disturbance detection):** It refers the working areas /equipments will be clean (Aurel et al., 2010). It is order in a workplace allowing on increase of safety of workplace, control of equipment and responsibility for the means of production (Karkoszka & Honorowicz, 2009).

- **Seiketsu (standardizing / consolidation):** It refers the extension of the cleaning concept to each individual alongside with the continuous practice of the third step (Aurel et al., 2010). It represents reminding employees about their duties in the aspect of care of used tools and equipment and about keeping the workplace order (Karkoszka & Honorowicz, 2009).

- **Shitsuke (discipline):** It refers getting self-discipline and getting used to be each involved in the 5S actions through standard application (Aurel et al., 2010). It is adaptation of employees to the principles accepted by the organization, independent elimination of bad custom and training (Karkoszka & Honorowicz, 2009).

### 3.2.2.2 PLAN, DO, CHECK, ACT (PDCA) CYCLE

According to Karkoszka & Honorowicz (2009), process of kaizen thinking basically consists of following steps:

- Definition of the improvement area.
- Analysis and selection of the main or key problem.
- Identification of the cause of problem.
- Planning the remedial measures.
- Implementation of the improving project.
- Measuring, analyzing and comparison of the results.
- Standardization.
Literature shows that the kaizen method consists of two basic principles or which are:

1. Standardization or maintenance of existing condition.
2. The elimination of waste and inefficiency or Improvement of existing condition.

Process of kaizen idea is closed in PDCA (Plan, Do, Check and Act) cycle (Karkoszka & Honorowicz, 2009). This cycle is known as kaizen or continuous improvement cycle and its parts are as under:

**Figure 3.2.3:** Improvement and maintenance cycles

Source: Adapted from Singh & Singh (2012)

- **Plan (P):** It is related with the study of existing condition and it establishes for the goal of improvement.
- **Do (D):** It is related with application of the plan.
Check (C): It is related with determining the effect of implemented plan to know whether that plan has brought the intended improvement.

Act (A): It is related with standardize the action for preventing repetition of the original problem or it sets goals for the future improvement.

3.2.3 HISTORY OF KAIZEN COSTING

According to Wellington (1995), kaizen originated as a business concept in Japan. Kaizen approach operates in Japan in a special business environment, where workers have lifetime employment facility in big companies. Wellington (1995) revealed that kaizen as wholesome not acceptable in Western thinking and behaviour, nor good in the best concern of employees. The Japanese companies are now introducing group-oriented environments. Japanese embarked this to response the 1991 recession. Kaizen is not a new concept because companies and people are applying it from last decades without knowing it. In the sense of management it is improvement and kaizen offers far more chances of improvement. Barnes (1996) includes many techniques and tools under kaizen concept and these tools are known as kaizen instruments and some of these tools are quality control or circles, suggestion schemes, just in time inventory and cross functional management. Wellington (1995) criticized the use of kaizen instruments as individual processes and argued that two features or elements of the kaizen concept were often unnoticed as: (1) kaizen does not use to improve production, to achieve goals and for better customer satisfaction because members do not usually recognize the importance of any new system and (2) kaizen is mainly used by selected members or departments. But now after its successful use in Japanese firms, kaizen is also accepted and used as a very useful approach by manufacturing firms and it is being accepted on worldwide level for better management and performance. According to literature kaizen costing is derived from kaizen concept and it is the part of kaizen philosophy.

3.2.4 CONCEPT

Kaizen costing was originated as cost management practice in Japanese companies after World War II. Kaizen costing is known “Genkakaizen” in Japanese companies. Kaizen costing method is used in manufacturing stage of the existing products as cost reduction
process. Kaizen costing focuses on continuous improvement in all processes, customers satisfaction and on involvement of all employees of company. Kaizen costing is derived by Japanese automobile companies. In 1960 Toyota established the cost management technique namely kaizen costing (Toyota Motor Corporation, 1987). Yasuhiro & John (1993) commented that kaizen costing works on the establishment of a cost reduction target amount through continuous improvement or kaizen activities in operations. Guilding et al. (2000) stated that kaizen costing is a strategic management accounting practice which is forward-looking and closely aligned to a quest for competitive advantage. According to Yasuhiro & John (1993) kaizen costing activities maintain the current level of the existing production costs and further reduce costs to an expected level based on the plans of firm.

The strong point of kaizen costing comes from its close connection with the profit planning process of the company, hence company can examine its progress toward the long-term goals. Kaizen costing activities involve continual small incremental product cost improvements in the manufacturing phase of the product in contrast improvements in the design and development phase. Kennedy & Widener (2008) described the term kaizen costing as continuous improvement and time improvement by eliminating waste and reduction of costs. Kaizen costing is concerned with reducing the costs of existing products and processes (Hansen & Mowen, 2003). Kaizen costing is a method that ensures a product should meet customer requirements for quality, functionality and price to maintain product competitiveness (Ellram, 2000). Kaizen costing focuses on continuous costs reductions, which is realized for existing products in a company (Cooper, 1995). The kaizen costing method of cost management involves the product design and development team after establishing and implementing the product and process design in manufacturing phase, it also focuses on the operational character of the process and production in efficient manner. This method requires the focus and attention on cost reduction. Kaizen costing does not focus mainly the product but it focuses on the production process and for this important factor is communication capacity. According to Kaplan & Cooper (1998) kaizen costing is an approach to develop a costing system to carry continuous improvement activities in a company. Its purpose is to motivate operators to drive costs down, rather than to record historic costs and variances. Standard
costing system focuses on meeting cost standards and avoiding adverse variances while kaizen costing focuses continuous cost reductions (Shank & Fisher, 1999; Tanaka, 1993). Kaizen costing is about beating the current cost levels, not matching standards and explaining variances (Bicheno, 2000). Kaizen costing is less worried about accuracy and more worried about putting information in the hands of the people doing the work for decision making. Thus, kaizen costing is a method of cost reduction during the manufacturing phase of product and it focuses continuous improvement of the production process to do better and reduce wastage part of cost of production. Kaizen costing involves maintaining the levels of present costs to produce products and perform regular work to reduce costs to reach the desired level. Kaizen costing is one of the productivity improvement methods (Vincent, 2004). Kaizen costing technique is a method to improve productivity and cost savings by continuous improvement in the manufacturing process.

Monden (1995) stated that kaizen costing as the maintenance of present cost levels for products presently being manufactured through systematic efforts to achieve the desired cost level. Kaizen costing is the inclusive and continuous approach to reduce costs after the production stage of a product. In kaizen costing both the product and the production process are considered. Drury (2008) argued that the focus of kaizen casting is on the production processes and cost reductions are resulting mainly through the improved efficiency of the production process.

*Monden & Hamada (1991)* defined kaizen costing as “The system to support the cost reduction process in the manufacturing phase of the existing model of product and is also relevant to other downstream (non-manufacturing) costs”

Kaizen costing can be defined as small improvement in cost of existing products which is slowly performed with succeeding performances and it is maintained by those persons who are participating in activities.

Basically in kaizen costing a cost reduction target is set which is then applied with the actual costs of the previous year. In kaizen costing method cost reduction are planned with continuing kaizen activities throughout the life cycle of product. Participation of all members of the organization in kaizen targets can motivate employees toward attaining the cost reduction targets. Kaizen costing forces changes in the ways or production processes and it creates a link between cost reduction activities and manufacturing
processes to improve value of product and earnings of firm. Kaizen costing maintains the current production level and further tries to reduce the cost at expected level. Thus, kaizen costing includes two main aspects, (1) maintenance of current production conditions then (2) improvement in current production conditions.

3.2.5 KAIZEN AND KAIZEN COSTING CONNECTION

The kaizen means improvements in small steps was developed for quality improvement. On the basis of kaizen concept, Yashuhiro Monden, from Japan, developed the kaizen costing concept which is translated as enhancement estimation. Literature stated that kaizen philosophy ensures continues improvement by sustaining the process of cost reduction in manufacturing phase. Kaizen basically assume that every worker of company knows how the task is undertaken and whether there is any better way of doing it. It is not so much a costing routine as the outcome of developing an organizational culture of collaborative learning at all levels of the company. Kaizen is based on thought and action through work-teams to search for improvement. Kaizen system has precise cost improvement activities for each department. Kaizen costing comprises cost reduction activities requiring changes in the manner a company manufactures existing products. Kaizen is the process of seeking continuous improvement.

Kaizen involves small improvements as result of constant efforts of all level employees and it works on PDCA (Plan, Do, Check, Act) concept. Literature states that when any Japanese company follows the Plan, Do, Check and Act thinking, then firstly under this philosophy they find a problem raised in the company like producing non standard product, then after identification of problem management makes a plan for this, finally taking a solution to beat the problem and changing the work procedures to remove the problem. The managers apply the kaizen tool PDCA (Plan, Do, Check, Act) cycle for kaizen costing implementation. Kaizen costing removes non-value added cost. Hassen & Mowen (2003) described two recurring major sub-cycles in cost reduction process (1) continuous improvement cycle and (2) maintenance cycle. According to Hassen & Mowen (2003) continuous improvement cycle is defined by a plan-do-check-act sequence (PDCA). Improvement refers to activities directed towards maintaining operating standard situation in good condition and upholding such standards through
training and discipline (Jagdeep & Harwinder, 2009). According to Hassen & Mowen (2000) the maintenance cycle follows a traditional standard-do-check-act sequence (SDCA). Jagdeep & Harwinder (2009) defined that maintenance refers to activities directed towards to inspiring current standards. The important aspect of kaizen is improved the business and product elements such as quality, cost, delivery etc. Quality improvement in terms of product features, cost improvement in terms of production cost and delivery improvement in terms of on time distribution of product. The improvement of cost part is done by controlling and reducing cost inadequacy. For this kaizen costing technique can be used to reduce the production cost and improve the product quality. Thus, kaizen term is used for whole organization for continuous improvement and kaizen costing is the part of kaizen term which is used for continuous cost reduction for existing products and it is based on the ideology of kaizen. In some previous studies kaizen term is also used for kaizen costing.

3.2.6 OBJECTIVES OF KAIZEN COSTING

According to Wellington (1995) kaizen costing is a manner of thinking and behaving. Guidelines are provided for teams members in the company to direct their efforts towards the attainment of desired profit through product and process improvement intended to enhance customer satisfaction. In kaizen costing approach every member’s concern is required for improvement and any employee may take steps to improve a product, reduce costs and eliminate waste. Monden & Lee (1993) said that kaizen costing works as a budgetary control system but not as standard cost system. The aim of kaizen costing is to reduce the actual costs of product below the standard costs, not meet the standard. Daihatsu Motor Company applied kaizen costing by the establishment of cost reduction targets and for the accomplishment company focused kaizen activities or continuous improvement activities in operations.

Monden & Lee (1993) noted that Daihatsu Japanese Company defined kaizen activities as those activities that, sustain the current level of the existing car production costs, and further reduce it to the expected level based on the company plan.

Monden (1995) expressed that the core aim of kaizen costing is the cost reductions at each phase of manufacturing to close down gaps between target profits and estimated
Drury (2008) stated that the objective of kaizen costing is to shrink the components cost of product by a pre determined amount. The main objectives of kaizen costing are described as under:

- Provide guidelines for profit making and to enhance customer satisfaction through product and process improvement.
- Eliminate non value-added activities and their costs.
- To make every employee responsible for improvement.
- Focus to reduce actual costs under the standard costs, not meet the standards for continuous improvement.

### 3.2.7 FEATURES OF KAIZEN COSTING

Kaizen costing in Japanese companies is not implemented according standard costing and it is implemented outside the standard costing method. Standard costing is not suitable for cost reduction in manufacturing stage due to its financial accounting purpose and its unsuitable features. Kaizen costing has large area than traditional standard costing system. Kaizen costing focuses on the change in the production process of the existing manufacturing products. Kaizen costing covers two types of activities: first activities are performed when there is a large difference between actual cost and target cost and the production of products has been started while second activities are performed continuously every time to attain allowable cost.

In the first type activities a kaizen cost committee is organized to achieve cost reduction target through the use of value analysis method. In second type activities kaizen cost reduction targets are established for every department. For fixed and variable costs different methods are used according their nature. For variable cost like material and labour kaizen cost per unit are decided for cost reduction and fixed cost is managed through overall kaizen cost of product through value analysis method. Therefore, value analysis is very important in the implementation of kaizen costing. Shop floor and upper level members can understand the kaizen cost reduction targets when these cost reduction targets are determined separately for variable cost and for fixed cost rather than total cost reduction targets.
3.2.8 COMPUTATION OF KAIZEN COST TARGETS

Japanese companies computed the kaizen profit or profit improvement on the basis of difference between target profits determined by top managers and estimated profit determined by the lower level managers. Japanese automobile companies considered that cost reduction in variable and fixed cost is necessary for cost savings. They think that kaizen cost reduction can be achieved through the variable cost reduction in mainly manufacturing department and in non manufacturing departments but kaizen cost amount for fixed costs can also be decided. The kaizen costing takes last year’s actual cost as base for cost reduction, then a kaizen costing goal is established for the specific cost reduction rate during the current year. The actual cost which has taken as base now compared with the preset kaizen costing cost reduction goal. At the end of the current year the actual cost of this current year will become the cost base for the next year, and in next year new lower kaizen cost reduction rates are set and cost reduction efforts are continued in the organization. The kaizen cost reduction goals are met through the removal of non value added activities costs, elimination of wastes and improvement in time management. The improvement suggestions given by employees are also taken sincerely by management, who implement these suggestions or ideas. Kaizen costing provides continually more competent and cost-effective production process (Hilton et al., 2006; Monden & Lee, 1993).

The ratio of cost reduction target is determined in considering kaizen profit and generally it is ten percent. After three months of the start of production of new product after the use of target costing process the next cost is reduced through the kaizen costing method. After this the kaizen cost targets for each plant is decomposed among different divisions and smaller units of the plants and these kaizen cost targets are achieved through daily kaizen activities. The kaizen cost targets are decided in the kaizen cost committee and managers determine policies (mainly non monetary measures) to achieve the kaizen cost targets. In kaizen costing process through the assignment of kaizen cost targets to different departments company can maintain the accounting control and the quality aspect can be achieved through the shop floor members activities. The shop floor members are involved in daily kaizen activities through suggestion schemes and quality circles. Therefore, kaizen costing helps in both shop floor control and accounting control.
According to previous studies like Tanaka (1990), Monden (1989) the amount of kaizen cost is decided in kaizen costing process and it is determined as under:

\[
(1). \text{Per product actual cost in the previous year} = \frac{\text{Total actual cost of last year}}{\text{Actual production in last year}}
\]

\[
(2). \text{Estimated amount of total current year actual cost} = \text{Per product actual cost in the previous year}(1) \times \text{Estimated production for the current year}
\]

\[
(3). \text{Kaizen cost target for the current year} = \text{Estimated amount of total current year actual cost}(2) \times \text{Ratio of cost reduction target}
\]

\[
(4). \text{Assignment cost to each plant} = \frac{\text{Cost directly controlled in single plant}}{\text{Cost directly controlled in all plants}}
\]

\[
(5). \text{Kaizen cost target for each plant} = \text{Kaizen cost target for the current year}(3) \times \text{Assignment ratio}(4)
\]

Table 3.2.1: Computation of kaizen cost targets

Source: Adapted from Monden & Hamada (1991)

### 3.2.9 FUNCTIONING OF KAIZEN COSTING

After a product is introduced, customers want increase in value of the product over time by greater value and lower cost. Plan of business demand a chain of incremental cost reductions (like 5% in a year) to stay in competition and cost-reduction activities are not ended with the completion of product design, they move to a new phase. The kaizen costing process is important and it is interactive process between management and work group employees. The kaizen costing method uses the target cost for cost reduction and it is calculated according to the principle of the standard cost. Kaizen costing system intends to reduce actual cost lower than standard costs and to achieve cost reduction targets. This system defines the yearly standard costs and checks the difference between standard and actual costs. When standard costs are not achieved then reasons are try to find out then accordingly decisions are made.
3.2.9.1 SETTING COST REDUCTION TARGETS

In kaizen costing cost reduction targets or kaizen cost targets are set for the product. The overall cost-reduction target is generally set at factory level then these targets are decomposed to departments and workgroups levels. When cost reduction targets are fixed the work group are empowered with enough freedom to achieve these targets. Generally in kaizen costing only those product costs (variable cost) are considered, which can be openly controllable by the shop floor workers in company. The shop floor workers and supervisors involve in the cost-reduction activities and they work in their own ways. The previous cost of product is used as a starting baseline for kaizen cost reductions. Firstly the cost-reduction targets are set according to the market and after this the firm assign cost reduction rate to each department but firm should not assign a common cost reduction rate to every department because some areas may have huge scope for cost reduction by use of new technology or manufacturing methods while some areas may have little instant scope for improvement. In kaizen costing management team leader sets cost-reduction goals for production processes and give freedom to the workforce to find new ways to achieve these goals. To achieve cost reduction goals which are generally not easy but attainable, workers take a variety of actions and find new ways to speed up manufacturing processes. This system starts when there is a gap between total actual cost and kaizen cost, like equation: \( \text{Total Cost} - \text{Kaizen Cost} = \text{Gap} \).

Kaizen cost reduction targets setting ways are shown through the following figure.
**Figure 3.2.4:** Cost reduction target or kaizen costing setting paths

**Source:** Adapted from Modarress et al. (2005)

According to Modarress et al. (2005) there are two ways to set kaizen cost targets in the company namely top down path and bottom up path. In the first way cost reduction targets are set by senior management according to the plans of the top management then their cost reduction target are accepted by kaizen teams after discussion. In the second way cost reduction targets are set by kaizen team members then the team presents their cost reduction targets for the approval of top and senior management. After the production or introduction of a new product Japanese companies usually predict that production will need approximately three months to settle down or expect the target cost can be achieved at that time. If the costs are still too high after this period then this is the signal to initiate a major cost-reduction program. A project team is formed for the consideration and management of all costs. The project team works on the value-analysis approach that highlights and adjusts possible areas for cost savings. The project team may be formed for considerable changes in the business environment such as increase in prices of raw materials. The team focuses on the production processes and technology to meet the cost targets. Then efforts are made to find the possibilities to reach that target. Major cost reductions can be broken down into smaller reductions and then the activities are identified and approved by the project or kaizen team and then workers or group members through their own activities handle the work with suitable activities. Cost reductions are planned throughout the life of product and a continuing series of kaizen activities are desired for this.

Kaizen activities and targets may vary depending on the type of cost like direct labour costs, for instance may be tackled by more effective use of labour, better training and planning and revised working practices. The results are measured after three months to evaluate the progress toward achieving its target. After this if work groups are failing to meet these targets causes are searched and these causes may be irrationally high targets, external factors beyond control such as supplier constraints. Costs must be later reduced in each following period to meet the target profit (Monden, 2000). To eliminate the suppliers constraints purchase department must build relation with suppliers. By clearing
the necessity for continual cost reduction, determination of cost reduction targets and monitoring the targets can inspire the staff toward achieving the cost reduction targets.

3.2.9.2 CONSIDERATION OF VARIABLE AND FIXED COSTS

Kaizen costing is applied by value analysis. In kaizen costing kaizen targets are set for all plants and manufacturing processes. Cost of raw material is significant for cost reduction and it can be reduced by better manufacturing processes. Purchased tools or items for product are generally not allocated cost reduction targets for cost reduction point of view these can be purchased at a low price with suppliers negotiation. Other variable cost is mainly centre of attention for cost reduction in kaizen costing which are reduced through value analysis. Fixed costs are not part of cost reduction. The cost reduction target rates are generally fixed for each product component and department only small changes are made in these rates (Monden & Lee, 1993). The company wide cost reduction target amount is allocated to each plant and these assigned target cost reduction rates in each plant may be higher or lower than the company wide rate (Monden & Lee, 1993). During decomposition of cost reduction targets different meetings are held at different levels of each plant for best allocation of targets (Monden & Lee, 1993). The total company wide target cost reduction target is actually decomposed among all cost elements. The kaizen cost improvement activities are very specific for every department in the company. Monden & Lee (1993) described that Japanese automobile companies like Daihatsu Motor Corporation prepares following six plans for cost reduction for the application of kaizen costing.

- Production, distribution and sales plan for expected margins from sales of product.
- Projected parts and material costs plan for purchasing department.
- Plant Rationalization plan for variable cost reduction in manufacturing processes.
- Personnel plan for labour cost reduction.
- Facility investment plan for depreciation and purchase of fixed assets.
- Fixed expense plan for non manufacturing costs reduction.

The general process of kaizen costing is shown in the following figure.
Figure 3.2.5: Kaizen costing process

Source: Own calculation of the researcher

According to Monden & Lee (1993) in kaizen costing method for the evaluation of each department performance first actual cost reduction is computed then it compares with target cost reduction amount and variances are noted. These variances may be positive and negative and they are the indicators of performance. Variation in prices and wage rates are not reflected in performance evaluation but reduction in labour hour, resource usage and expenses are scrutinized (Monden & Lee, 1993).

3.2.10 KAIZEN COSTING AND INNOVATION

According to Monden & Hamada (1991) kaizen the Japanese word and improvement the English word are two distinct concepts. According to Monden & Hamada (1991) kaizen refers to continuous accumulations of small betterment activities rather than innovative improvement and kaizen costing includes cost reduction in the manufacturing stage of existing products. Innovative improvement based on new technological innovations is usually introduced in the developing and designing stage (Monden & Hamada, 1991). Improvement can be defined as kaizen and innovation where kaizen is a strategy, maintains and improves the working standard through small, gradual improvements and innovation calls for radical improvements as a result of large investments in technology or equipment (Imai, 1986). Kaizen is unequal to the classic western manner of improvement because it creates the process for improvement by taking advantage of
human factor and classic western approach is based mainly on the innovative operations being characterized by necessity of executing considerable investment in newest the instruments and technologies (Karkoszka & Honorowicz, 2009).

Kaizen means continuous small activities than big innovations. Innovation means introduction of new technological change in the developing and designing phase (Imai, 1986). Innovation involves an extreme improvement as an outcome of huge investment of resources in new technology or equipment. Innovation is viewed as an immediate quantum leap in technology while appropriate characterization of kaizen is to take baby step improvements in processes or methods over an extended period of time. Major innovations bring about remarkable results but they require large sums of money. On the other hand in kaizen continuous improvement through employees suggestions represents an incremental ongoing process as one small invention is added to another and everyone can participate in using common sense to make logical improvements. When a constant stream of small improvements flow from all employees, a powerful force is set in the minds of employees. Kaizen involves a strategy of both maintenance and improvement. This is why kaizen has become an important tool of managerial strategy. The continual improvement process is just like a two wheeled vehicle or cart. One wheel of the cart is kaizen and the other is innovation. Kaizen costing works on kaizen philosophy and engaged in continuous cost reduction but without investment of high funds and technological innovation.

3.2.11 EMPLOYEES INVOLVEMENT

A major feature of kaizen casting is that shop floor workers are given the responsibility to decrease cost and to improve processes. The basis of many of the cost improvement ideas is that the shop floor workers closest to the product and production process. Kaizen costing implementation needs the culture in which work groups can always try to meet their cost targets and be able to identify the progress during the period. Kaizen targets or cost reduction targets must be both attainable and satisfactory to meet generally company objectives because if the cost target is too high workers cannot attain these and it will frustrate them and if cost target is too low they will not take interest in these targets. It is assumed that work groups are able to identify the place of waste existed in a process.
Literature stated that the implementation of the kaizen costing method involves the improvement of the production process with staff or shop floor workers formation, motivation and encouragement, with the identification of cost reduction possibilities. The main criticism of this method is stress on the staff. Literature said that this continuous cost reduction method is stressful by its nature. This philosophy is so deep-rooted that the team leaders and foremen in manufacturing companies are required to meet regularly to discuss their progress for reducing costs. Kaplan & Cooper (1998) mentioned that kaizen philosophy favours to delegate more authority and responsibility to the specific teams in order to provide them freedom in improving their parts in the process. In this system every activity is supported by a work team that shares the result. Kaizen costing is carried out by the team members and it is mainly related to operational measures. The team members are asked to produce weekly product costs which could be decreased over time against cost target.

3.2.12 VALUE ADDED ANALYSIS FOR KAIZEN COSTING

Literature said that there are two types of value of a product (1) use value and (2) ownership or esteem value both values are different from standard point of value of consumer for example difference between a luxury car and a basic small car while each has the same engine. However, use value and the price paid by a consumer for a product may not be same but actually difference is created by esteem value. There is no direct relationship between ‘cost’ and customer ‘value’ in use and esteem but it is important for all managers to understand the nature of costs. Basically there are three key costs of a product as: (1) cost of raw material or parts purchase which is related with the supply chain, (2) direct labour cost or wages paid to workers and (3) cost of factory overheads that includes other expenses of production.

A detailed understanding of how costs is associated in design, development and manufacturing stages is the part of value analysis activities and this tool focuses at the reduction of avoidable and unnecessary costs without sacrificing value of product. Value analysis is introduced during the 1950s at General Electric by L. D. Miles. Value analysis studies the functions of the products and its parts. It establishes a function-cost relation for product. Value analysis process allows any improvement thought to be converted into
gains for the company and its customers. The key points of value analysis is the awareness about the customer requirements, the costs of the product and manufacturing process. Value added analysis helps to implement kaizen costing practices. Value added analysis is used to determined value added and non-value added activities in the manufacturing processes. The use of value-added analysis is suggested on the shop floor or factory level to assist work groups in getting their kaizen targets (Modarress et al., 2005). In general cost reductions may be identified within the product features, the activities performed in value chain or the resources consumed in these activities or processes. To shape a company’s cost structure according to competitive requirements; a sound analysis of cost of a company is needed from a customer’s viewpoint and value-adding cost analysis is relevant for this. Resources consumption should be concentrated to improve a company’s productivity and through value added analysis resources can be best utilized because non value added activities increase the consumption of resources and it increases the production costs. Hence, to avoid losses non value added activities should be adjusted or eliminated completely. Value-added analysis identifies the level of waste existing in a certain production process.

Basically there are two types of activities in production process namely value added and non value added activities (Modarress et al., 2005). Once cost targets are established for work groups the employees are provided indication of where non value added activities or waste exists in the process and to achieve these targets, value added analysis helps them. Value added activities transform materials into a product and non value added activities such as rework, inspection, queues, waiting time and moving material in the production process adds no benefit to the product. Value added activities create waste and unwelcome cost for the product (Modarress et al., 2005). The ideal situation would be one where value-added and non value added activities are easily recognized by workers and new ways are found to eliminate wastes or non value added activities. For this firstly the required time spent on each activity is measured then work groups identified where waste exists in the process and which non value added activity can be removed. Value-added analysis focuses on efforts of work groups, it must be on track and they can verify their progress in terms of removing wastes from processes. Thus, for small improvements, value analysis is necessary for successful application of kaizen costing.
3.2.13 PRINCIPLES OF KAIZEN COSTING

Kaizen costing is like a planning tool which assists to identify the features of product that can be improved and help in setting targets for cost reduction. Kaizen costing involves assembly setup improvements, economies of scale, work methods or processes to increase the productivity of shop floor operations without adding costs. Kaizen costing system focuses on making continuous improvements by production process of existing products without altering the functionality of product. Barnes (1996), Wellington (1995) explained 10 principles of kaizen costing practice in some Japanese companies and these are as follows:

1. Focus on customers and quality:
The primary focus of kaizen costing is on customer satisfaction and quality. If any activity does not add value to a product to enhance customer satisfaction it is considered as extra cost and should be eliminated.

2. Continuous improvements:
Kaizen costing is based on the thinking that today’s standards will not meet future’s demands. After the implementation of any improvement in the company the search for new ways to improve work should not stop or in other words the search for improvement not at all stops in kaizen costing. Therefore, it is focused on finding new way of improvement.

3. Open acknowledge the problems:
By a cooperative, no-blame, supportive and constructive work environment in company problems can be limited and rapidly resolved. Employees feel free to disclose errors, weaknesses and ask for help and this helps in continuous improvement.

4. Create work teams:
Cross-functional project teams are the framework of corporate structure in company. Each individual belongs to a team and every work team lead by a team leader. This develops a spirit of mutual ownership and collective responsibility among employees.

5. Promote openness:
Kaizen costing method demands for an open working area in company. It also requires open and creative thinking of workers for cost reduction.

6. Manage projects through teams:
Projects are planned and executed through cross functional or cross departmental teams members these teams even involve members from outside the company. Every activity must be performed under project teams.

7. Nurture the sound relationship:
The achievement of financial goals in any company depends on raising relationship. Japanese companies gives a great weight to harmony and Japanese companies carry a non-adversarial communication and the escaping from interpersonal conflicts.

8. Develop self-discipline:
In Japan workers are self-disciplined at workplace through religion and social norms. Though it is an important principle for the application of kaizen costing but it is a difficult principle to implement in western companies due to their culture.

9. Information to every employee:
All staff members are fully informed about their work and company’s mission, culture, plans and practices throughout their employment. This is a right attitude for complete understanding and acceptance of work conditions under kaizen costing.

10. Empower employees:
Kaizen costing requires empowering employees through multi skilled training, decision-making responsibility, feedback, job rotation, encouragement, access to data sources and reward to persuade their own and company’s dealings.

3.2.14 ESSENTIALS OF KAIZEN COSTING IMPLEMENTATION
In 1961, the automakers began to use the kaizen costing process by developing programs to substantially reduce the defect costs such as spoilage cost, reworking cost and claim cost by value analysis which brought suppliers into the collaborative manufacturing process. Kaizen costing is best suitable where long term change is required. According to Wellington (1995), for the implementation of kaizen costing the first step is to formulate a strategy. Vision is translated into action and with a usual planning and analysis process the resources of organization are used to take competitive advantage. The application of
kaizen costing requires some important factors. Two key factors for successful implementation of kaizen costing are required as: (1) after the determination of cost-reduction targets work groups should be held answerable for the targets and (2) the process of kaizen costing needs to be regular and repeatable or regular means set cost targets, measure cost targets for a given period and then reset new cost targets. Literature said that adequate management is required to achieve the continuous cost reduction objectives or kaizen target cost. For successful kaizen costing application an organization should focus on the following aspects:

- Control on all phases of the lifecycle of a product.
- Ensuring that products remain profitable throughout the entire duration of its life cycle in a progressive manner.
- Monitor the costs during this cycle by comparing the estimates and the obtained results.
- Ensuring that all engineers of the company must collaborate with suppliers.
- Continuous search of opportunities for reducing costs.
- Mobilization and motivation of all the competencies within an organization.
- A clear and communicated framework for the organization’s culture to eliminate illogical actions that can be the cause to lose the organizations way.
- Project development groups and members in the group should be responsible for precise project activities.
- The managing director or the higher authority should support the project development group through visible leadership.
- Involvement of all members working in company in planning and executing the transformation.
- Performance of workers must be measured and they should be rewarded.
- The work must be done through manageable or correctly controlled processes.

3.2.15 KAIZEN COSTING VS. STANDARD COSTING SYSTEM

According to Monden & Lee (1993) the effectiveness of standard costing system is to control costs and it is being used for the last several decades and some authors compared standard with kaizen costing to reduce costs. Literature showed many differences
between standard costing system and kaizen costing system. Monden (1995) explained differences between a standard costing system and kaizen costing and differences between these two terms are shown in following table.

<table>
<thead>
<tr>
<th>Standard Costing</th>
<th>Kaizen Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• It is cost control system.</td>
<td>• It is a cost reduction system.</td>
</tr>
<tr>
<td>• Its goal is to maintain current manufacturing condition only not change.</td>
<td>• Its goal is continuous improvement in manufacturing conditions or to reduce cost lower than standard costs.</td>
</tr>
<tr>
<td>• Assume to meet cost performance standards.</td>
<td>• Assume to achieve cost reduction targets.</td>
</tr>
<tr>
<td>• Cost variance analysis involving standard costs and actual costs</td>
<td>• Cost variance analysis involving kaizen cost targets and actual cost reduction amounts</td>
</tr>
<tr>
<td>• It checks the cost deviation and corrections are made when standard costs have not been achieved.</td>
<td>• It investigates and responds when kaizen cost target amounts are not attained.</td>
</tr>
<tr>
<td>• In the procedures of standard system standard costs are set for one or two times every year means annually or semiannually.</td>
<td>• Its procedure sets new cost reduction targets each month through continuous activities to attain target profits or to reduce the existing gap between the target and current costs.</td>
</tr>
<tr>
<td>• Not special activities are performed to achieve costs.</td>
<td>• Carries out kaizen activities during the entire operational year</td>
</tr>
</tbody>
</table>

Table 3.2.2: Differences between kaizen costing and standard costing methods

Source: Adapted from Monden (1995), Monden & Lee (1993)
3.3.1 COST MANAGEMENT FOR FUTURE AND EXISTING PRODUCTS

Environmental changes like short product life cycle, demand changes and keen competition raise the importance of cost management methods and the cost management methods must be used for new products production which can meet customers’ expectations as well as reduction of cost of existing products through the elimination of wastes. Therefore, a manufacturing company has to focus on design and development activities as well as production activities during the whole product life cycle. It creates the need of total cost management for a company. Total cost management refers cost management in all phases of product life cycle. This concept involves all members from different departments of the firm. Target costing and kaizen costing are taking attention mainly in the manufacturing companies. Conventionally cost management was attentive about reducing the cost of producing, current products at factory level. Generally there can be two kinds of product produced by company namely future products and existing products and according this there may be two types of cost management. Cost management includes both future products as well as existing products costs.

- **Future products** = those products which will be produced by the firm and the design stage of which has not been finished.
- **Existing products** = those products which are currently produced by the firm and the design stage of which has been finished.

Cost management focusing on reducing the manufacturing and distributing costs of existing products is called cost management of existing products and cost management focusing on reducing total cost during development stage of a new or future product is called cost management of future products and both type of cost management have main purpose of cost reduction. Cost reduction is sometimes used similar terms as cost management of new products (Makido, 1989). Previous researches shows that cost management of future products have many opportunities of cost reduction than cost management of existing products.

The total cost of product consists upstream and downstream costs. Literature showed that cost before start of manufacturing stage is called upstream cost while cost from and after
start of manufacturing stage is called downstream cost. The upstream costs are associated with development of product such as design, research and development and planning about product are incurred at the product design and development stage. Downstream costs are incurred at both manufacturing stage and operating activities (Kato, 1993). Kaizen costing involves manufacturing as well as non manufacturing downstream costs. Makido (1989) stated that the essence of cost reduction is to cut the present cost standards themselves. Kato (1993) argued that new product development stage is the key of cost reduction opportunities. Cooper (1994) observed that target costing is more efficient in managing manufacturing costs during product development than other traditional techniques of cost management. Target costing, kaizen costing and other new costing systems were developed to overcome the deficiencies found in traditional cost systems during the determination of product costs. Target costing, kaizen costing and other new costing methods emerged as an opportunity to present better decision-making stand for managers.

Cooper (1996) stated that managing the cost of new or future product is forward oriented which focuses reducing costs through well organized product design and target costing is used as forward oriented system. Managing the cost of old or existing products is backward oriented which focuses reducing costs through more efficient production and kaizen costing is used as backward oriented system. Forward oriented system target costing is appropriate for cost reduction and upstream cost management for new products. However, backward oriented system kaizen costing is appropriate for cost maintenance and downstream cost management for existing products. Thus, target costing and kaizen costing are often applied together. The objective of target costing is to design product at low cost and objective of kaizen costing is continuous cost reduction. Target costing together with kaizen costing generates unique ideas for cost reduction as well as product development.

Many other studies explained the whole life or life cycle cost of a product also depends upon decision taken during design and development stage because it creates more chances of cost reduction, though not only future products but existing products, cost management is also important. Life cycle costing focuses on a detailed total cost attainment which starts from research, development, maintenance, production, operations
and design to determine the cost of a product. Rahman & Vanier (2004) presented an equation of life cycle costing as under:

\[
\text{Life Cycle Costing} = \text{Acquisition Cost} + \text{Ownership Cost}
\]

The acquisition cost includes the direct and indirect costs for the production of the product and ownership cost includes the costs of utilizing and maintaining the product. Total life cycle cost refers to developing, selling, handling and post-sales services for the product (Ansari & Bell, 1997).

Value engineering, functional analysis and value analysis are essential tools for cost reduction, which are used with target costing and kaizen costing methods for both type of products. It can be said that target costing and kaizen costing are two cost management tools which are adopted to reduce life cycle cost of both future and existing products. Shields & Young (1991) used the term “product life cycle cost management”. Hence, cost management should give attention on reducing the total cost or cost throughout whole life cycle of product.

### 3.3.2 NEED OF TOTAL COST MANAGEMENT

Features of today’s market have emerged the importance of new costing systems target costing and kaizen costing. The important features of today’s market can be summarized as:

- Increased competition and frequent innovations.
- Increased costs of product design.
- Decreased product life cycle.
- Increased manufacturing and non-manufacturing costs.
- Increased importance of customers demand.
- Rational customers.

Now companies understand that their products must be innovative, high quality and low cost products. In competitive environment the gap of cost and prices of product is decreasing continuously and it squeezes the profit margin of firms. Today, majority of companies focus to squeeze out the fat of cost of production. Moreover, companies can get more by reduce costs than marketing and distribution efficiencies. It shows that companies have to be cost conscious during entire life cycle of product. Now it is
essential for companies to focus their product’s feasibility, ability to earn profit and costs throughout the life cycle of product. The main reason of the need of total cost management is the gap or relationship between cost and price which is depicted in the following figure. This created the need of total cost management or cost management of both new as well as existing products. In competitive environment now manufacturing companies have moved to use Japanese cost management tools like target costing and kaizen costing.

![Image of a chart showing the relationship between cost, price, and profit margin over time.](image)

**Figure 3.3.1:** Price and cost relationship in competitive market

**Source:** Adapted from IMA (1994)

In 1960’s Japanese manufacturing companies were facing extremely competitive markets. According to previous studies Toyota is almost a representative company of Japan and Toyota is positively famous for it’s both technical as well as its financial high performance during last decades. The company Toyota is also the pioneer of typical Japanese management accounting technique which is target costing. During 1960’s management of Toyota separated the cost management process into three different approaches (1) target costing, (2) cost maintenance and (3) kaizen costing (Toyota Motor Corporation, 1987). The Japanese manufacturing companies observed that planning and development process of a product cover about 80% of total costs of product (Ansari & Bell, 1997). It is widely acknowledged near about 80% of the product costs are
committed during the product planning and design phase so a lot of cost reductions can be achieved during this phase (Cooper & Kaplan, 1999). It is observed that strategic alliance between the firm and its customers or suppliers is required (Kaplan & Atkinson, 1998). Target costing and kaizen costing were initially used by Japanese automobile companies to balance the cost and required quality of products. Berliner & Brimson (1988) argued that most of the part of product is determined in the product development process. Japanese leading automobile companies as Toyota and Nissan used new techniques now known as target costing and kaizen costing then some North American automobile companies like Ford and Chrysler begun to use these approaches. Target costing is a new cost management tool that manages the cost of new products very well through changes in its design and kaizen costing is new cost management tool that manage the cost of existing or old products through increased efficiency of the production processes (Monden & Hamada, 1991). These concepts are totally different from the traditional state of mind. Target costing is a strategic management accounting practice which involves shaping the price by first the market is willing to pay and then produces a product or service to meet that price and kaizen costing involves the continuous improvements of products (McLaney & Atrill, 2002). These two costing methods stand important concepts for managers involved in the manufacturing, development and marketing of products in current globally competitive markets (McLaney & Atrill, 2002). Target costing and kaizen costing practices provide strategies that facilitate cost effective services to contribute in competitiveness of the company. Manufacturing companies face continuous pressure to reduce their product costs in order to remain attractive to consumers.

3.3.3 TOTAL COST MANAGEMENT

The Japanese total cost management concept includes two components namely target costing and kaizen costing. The coordination of target costing and kaizen costing is done to ensure a proper implementation of the total cost management to attain goals of the company (Monden & Lee, 1993). Monden & Hamada (1991) defined target costing (Genka kikaku) as the system to support the cost reduction process in the development and designing phase of an entirely new model, a full model change or a minor model
change. Monden & Hamada (1991) defined kaizen costing (Genka kaizen) as the system to support the cost reduction process in the manufacturing phase of the existing model of product. According to Monden & Lee (1993) kaizen costing approach employed with target costing helps Japanese manufacturers to achieve their objective of cost reduction during the entire product design, development and production cycle. Target costing is a costing method which ensures that product must be designed at a low cost to sell product at cheap price with satisfactory profit. Kaizen costing considers value and profitability for both new and existing products in the manufacturing phase. These both costing methods are used by Japanese automobile firms since the development of these methods. After the stages of product development, design and manufacturing kaizen costing follows target costing (Monden & Lee, 1993). Both methods are used for better business performance with improvement in quality and functionality of the product. The target costing and kaizen costing have goal of production of products at low cost with increasing customer value and allow firm satisfactory profits.

Thus, both costing methods are used as means of increasing firm’s profits and customer product value. Traditional standard costing is based on standards and operates in a static manner while target costing and kaizen costing consider cost standards only as intervening objectives and focus on continuous and dynamic cost improvement. Unlike traditional standard costing where a standard cost is estimated for each product, the target costing and kaizen costing are proactive approaches. Makido (1989) stated that “the essence of cost reduction is to cut the present cost standards themselves”. Monden & Hamada (1991) stated that target costing and kaizen costing cannot be viewed separately or both systems are inseparable. Target costing and kaizen costing are seen as the essential elements of Japanese cost management. If anyone of them is ignored total cost management cannot be properly implemented during the whole product life cycle. Literature said that 80% to 95% of the cost of a product is determined in the design stage before manufacturing stage. Companies should focus on cost management during design, development and manufacturing cost of product (Kaplan & Atkinson, 1998). Companies tend to believed that a big proportion of products costs is locked in design stage therefore cost reduction is mainly possible in this phase of product and when design of product has been set little cost can be reduced. But after design stage there are various chances of cost
reduction, it just depends on way of working. In this belief now firms use many cost management programs. Companies can integrate a variety of techniques to significantly reduce costs not only in the design phase but throughout the product life cycle.

Companies those have small product life cycle focus more upon target costing and those companies which have long product life cycles focus more upon on kaizen costing during operations. Target costing and kaizen costing are two major cost management techniques and companies can apply these both techniques for cost reduction during the life cycle of a product. Kaizen costing is useful to a product that is already under production. The time earlier to kaizen costing is for target costing, which involves decision about target cost of a product before it reaches in the market. Together, these two concepts frame life cycle cost reduction of product. Both techniques for managing costs play vital role in the firm’s integrated cost management approach. Target costing is closely related with kaizen costing approach but target costing is used in the development phase and kaizen costing after product launch (Monden, 1992). The following table presents the stages of application of both target costing and kaizen costing.

<table>
<thead>
<tr>
<th>Cost-management technique</th>
<th>Phase in product life cycle</th>
<th>Objective</th>
<th>Focus</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Target costing</td>
<td>Product design</td>
<td>Cost reduction</td>
<td>Product design</td>
<td>Systematic</td>
</tr>
<tr>
<td>2. Product-specific kaizen costing</td>
<td>Manufacturing</td>
<td>Cost reduction</td>
<td>Product design</td>
<td>Ad hoc</td>
</tr>
<tr>
<td>3. General kaizen costing</td>
<td>Manufacturing</td>
<td>Cost reduction</td>
<td>Production process</td>
<td>Systematic</td>
</tr>
</tbody>
</table>

Table 3.3.1: Techniques for managing costs and product life cycle phases

Source: Adapted from Cooper & Slagmulder (2004a)

Cooper & Slagmulder (2004a) highlighted that (1) target costing is applied during the design stage to design a new product to reduce its costs while maintaining a desired level of product functionality and quality, (2) product-specific kaizen costing enables the rapid redesign of a new product during the early stages of manufacturing to correct any excess cost after target costing and this technique is applied just for high-volume products immediately after the product is launched, above their target costs and this technique is applied in an ad hoc manner because it is specifically used only for those products that not succeed to attain their target costs but for strategic reasons are launched and (3) General kaizen costing technique focuses on the manner a product is manufactured when
the product design has been set and thus in this way all these three can achieve and manage life cycle cost of product. Cooper & Slagmulder (2004a) stated that when aggressive cost management tools are used then cost reduction in the manufacturing phase is a significant source of savings. Cost can be reduced throughout the product life cycle and savings can be achieved through a mix of low-cost product design and improvements to the production process (Cooper & Slagmulder, 2004a). Integrated cost management leads low costs throughout the product life cycle. Company can spread target costing and operational control through kaizen costing (Monden, 1995). The stand-alone use of cost-management techniques might limit their effectiveness but integrating use of cost management techniques can lead to even higher levels of cost reduction and superior overall performance (Cooper & Slagmulder, 2004a). Product life cycle and costing techniques have been presented in the following figure.

![Diagram](image)

**Figure 3.3.2:** Costing methods and product life cycle stages

**Source:** Adapted from Cooper & Slagmulder (2004a)

The disciplined use of target costing forces the design process to be cost responsive from very beginning. After the use of target costing method when a product is launched for the first few months of production managers give time to workers to learn about the new design and to manufacture it efficiently. During this time engineers try to identifying new ways to reduce costs by redesigning the product.
Target costing and kaizen costing are the primary mechanism for delivering the total cost management of Japanese automakers (Monden, 1989). The target cost is the maximum allowable cost for the production of a new product at a particular point in time, and it is most typically applied when product is first delivered to a customer (Cooper & Slagmulder, 1999). Kaizen costing, in contrast, is the cost of the product during its later or after development stage of product lifecycle through kaizen improvement activities (Monden, 1992). The combined foam of Target costing and kaizen costing approaches give attention to three major points which are: (1) customer focused, (2) product value propositions and (3) future-orientation. Target costing and kaizen costing approaches have become the mean for the costing of engineered components or products within high volume and having relatively long lifecycle industries such as the automotive, aerospace etc. The important aspect is the involvement of supply chain members to maximize the stability, control and to manage the input prices of all components and commodities (Hirabayashi, 1989). However, this combined approach has not been applied successfully in industries where suppliers are arguably in a lower power position. This combined approach therefore, needs collaborative behavior in this commercial environment.

Standard costing is typically applied about allocating prices and it is not focused on directing improvement activities even it does not give more importance to the involvement of suppliers. Target costing and kaizen costing, in contrast focus on cost improvement as per the requirements of the customer with a wider set of total quality measures. However, this approach is more appropriate for standard products like car components and this approach is more beneficial with wider and voluntarily supply chain involvement (Womack & Jones, 1996).

This combined approach determines a fixed short-term price of product and wider visibility for the long term. It focuses direct attention and behaviour towards necessary suppliers strategies both in the short and long term. The following figure shows techniques for cost management of future and existing products or it can be called total cost management or life cycle cost management of a product and figure also shows that target costing is used first for manage the cost of a future product then after this when product has been finally designed and production of the product has been started then
kaizen costing is used to reduce the cost of product. Hence, these are integrated cost management methods which have a relationship and this is depicted in the figure 3.3.3.

![Diagram of Total Cost Management with Target Costing and Kaizen Costing](image)

**Figure 3.3.3**: Techniques for cost management of future and existing products

**Source**: Own calculation of the researcher

According to literature big companies are taking benefits from understanding and applying target costing and kaizen costing. Target costing is used in development stage for a product because mostly cost part of product is covered under design and development stage it seems essential for company but it is not assured that once the production begins costs will remain at the same level. For this after design stage kaizen costing is used for existing products. Hence, the effectiveness of cost management depends on the effective linkage between target costing and kaizen costing.

### 3.3.4 INTEGRATED PROCESS OF TOTAL COST MANAGEMENT

Target costing employed with kaizen costing helps Japanese manufacturers to realize their major goal of cost reduction during the whole product design, development and production cycle. It is supposed that target costing activities are mainly involved only in development stage of a product. This faith is based on the supposition that near about 80 percent of product costs is locked before the commencement of production stage. Even after the successful application of target costing method in design stage of product, does
not guarantee that after this stage cost will remain predicted. Therefore, the effectiveness of target costing depends on the successful linkage between kaizen costing and cost maintenance. For example when target cost cannot be reach even after production starts a special kaizen cost committee is made to do this. For the effective target costing not only production or process engineers but also the shop floor members are involved. Big companies always looks for new ways to reduce costs and eliminate total wastes such as material scrap, material handling, excess inventory and so on even after the start of production. For modifications in the product after this design stage, continual process improvement and supplier management efforts are all activities of the kaizen costing. After the attainment of target cost the product whose price is declining can retain in market through kaizen costing. This is the trigger of new profit opportunities for new generation product having different characteristics. When new-generation product enters into production after this kaizen costing technique is applied. Japanese companies connect a target costing planning process with a kaizen costing process when products are in production. Target costing and kaizen costing are two different techniques for managing costs in product design and manufacturing stages of product life cycle respectively and both have their own objective, focus and application. Kaplan (1988) discussed that kaizen technique can be used successfully with target costing method. Costs can be forcefully managed throughout the product life cycle with these techniques in an integrated manner and the outputs of target costing technique acting as input to kaizen costing. Finally the total cost management process with these methods mainly cover four stages: (1) establishment of the target cost, (2) team-oriented and cost reduction efforts based on value-engineering during design stage, (3) application of kaizen costing during the manufacturing stage by determination of cost reduction targets and (4) introduction of the new or next generation product when some other cost improvement opportunities can be accessed by kaizen costing method.

In the following figure the integrated process of target costing and kaizen costing as total cost management is enumerated.
Market Research and Analysis

Establishing a Target Selling Price

Establishing a Target Profit for the Product

Determine the Target Cost

Use of Functional Cost Analysis or Value Engineering

Determine the Cost Estimate

At Target

Make the Final Decision

Start Production/Manufacturing

Cost Reduction Targets

Product / Processes Changes

Continuous Improvement (Kaizen Activities)

Figure 3.3.4: Target and kaizen costing integrated process

Source: Adapted from IFS (2001)
3.3.5 LINKAGE BETWEEN TARGET AND KAIZEN COSTING

Some authors stated that kaizen costing is separate from target costing. While some authors explained that kaizen costing is an integral part of target costing because it is attained through continuous improvement. “Genka kaizen” is commonly called kaizen costing focuses on reducing cost in the production phase of product is a part of the Japanese companies cost management system which is directly associated to target costing system. Target costing is commonly called “Genka kikaku” is planned to reach product cost target determined according to the market price. Horvath & Lamla (1996) presented the link between both concepts. Kaizen costing is the way of complete utilization of cost reduction potentials through little innovative steps for continuous improvement which are initiated by target costing (Horvath & Lamla, 1996). The kaizen costing philosophy is a cost control system of Japanese companies, because it is used to meet cost reduction activities and for this it requires changes in the processes or way the company operates. Kaizen costing works continuously for costs reduction during the production process to make sure that target cost has been met. Kaizen costing complete utilizes the possibilities of cost reduction in the organization. Effectiveness of target costing depends on linkage between target cost and cost maintenance.
Figure 3.3.5: Linkage between target costing and kaizen costing during production

Source: Adapted from Hines et al. (2006)

Target costing is the first step then after this kaizen costing works on the basis of the gap between cost targets and actual previous costs and the association between both is presented in the figure 3.35. Kaizen costing is closely linked to target costing (Feil et al., 2004). These two costing concepts cannot be treated separately. Shank & Fisher (1999) suggested that kaizen costing and target costing are different and should be treated separately. It is observed after the study of literature that both are separate costing methods because both methods have their own different features, application, essential etc. and integration of target costing and kaizen costing methods are considered as total cost management and both are inseparable. Target costing and kaizen costing are different cost management techniques but both are interrelated or complementary.

3.3.6 VALUE ANALYSIS & VALUE ENGINEERING

Target costing and kaizen costing techniques operate along with value engineering and value analysis concepts. Some authors explained that value engineering, value management and value analysis are similar terms. While some authors differentiated these terms as value management is a method while value engineering and value analysis are the application of this method. Some other stated that value engineering and value analysis are interchangeable terms. The main difference between both terms is that value engineering is implemented during pre production stages and value analysis is implemented during the post production stages. Value engineering refers to cost improvement by essential functional changes in development stage of new or fresh product while value analysis refers to cost improvements by design changes (Monden & Sakurai, 1989). The value engineering activities are performed before, during and after the design stages (Tanaka, 1989). The value engineering is engaged before and value analysis after the mass production of a product model begins (Monden & Nagao, 1989). Value analysis involves cost reduction activities for the changes in existing products. Value Analysis /Value Engineering is a most powerful tool to evaluate the cost structure with customer value and it is widely being used by major companies world-wide like Hewlett Packard, Sony, Panasonic, Toyota, Nissan, and Ford since 1940s. This technique
was developed in America at General Electric company during the late 1940s. Value analysis /value engineering is a systematic process of analysis and evaluation, and this is concerned with the functions of a product. The value analysis approach is popular among manufacturing companies and it can be used to analyze existing products or services offered by company. Value engineering approach is for new products and based on same principles of value analysis technique and can be used in pre-manufacturing (development and design) stage. It is also a technique of management accounting which is now integrated with target costing and kaizen costing. Value analysis focuses mainly to discover and eliminate product or service features that add no right value to the product but have cost in the process of manufacturing. Value analysis process is used to present a higher performing product or value at least cost to the customer. Value analysis and value engineering are usually treated as synonyms but Toyota explained the differences between the two terms as value engineering is for prior the start up of production while value analysis is for after the start up of production. Originally engineers were performed value engineering activities but now gradually this is used by other members involving in design, purchasing, technical working at plants, accounting and finance. For the calculation and management of the product costs, the important function of an organization is to investigate the activities and tasks that cause rise in costs (Horngren et al., 2006). To achieve the target costs management focus on eliminating some activities which are not required or less important and reducing the costs of all activities in all the value chain functions (Horngren et al., 2006). This can enable an organization to realize the target costs and offer products at target price.

The value engineering methods is divided into three groups: zeroth look, first look and second look value engineering (Cooper, 1995). These three aspects are applied in different stages of the product development. Zeroth value engineering part is used at the product development stage and it works to develop revolutionary solution of product design and to improve the functionality of the product. First look value engineering is used at the late product development stage to design and develop new products with an increased value without an increase in costs. Second look value engineering is used at the last part of product development stage to generate more value and functionality to existing products where it can be called value analysis.
3.3.7 TARGET COSTING VS. KAIZEN COSTING

The kaizen costing and target costing methods are similar in one aspect that they chase a target. Literature stated that both target costing and kaizen costing systems have two main similarities as: (1) help in control & systematic functioning and (2) help in attaining the overall objective of market demands. Kaizen costing and target costing both systems focus on cost reduction activities and processes. Both systems differ in their application and respective periods of operation. The differences between target costing and kaizen costing can be explained better though the following figure.

**Figure 3.3.6**: Costing methods differences

**Source**: Adapted from Bayou & Reinstein (1998)

According to previous studies there are two basic differences between these methods as: (1) the way these cost management systems set the respective target means, where target costing method starts from the necessities of the customers and the kaizen costing method follows objectives imposed by the top managers and (2) use/purpose of these cost management systems, where target costing method is used before the product is launched or ready to be manufactured by the design team whereas the kaizen costing method is
used during the manufacturing stage of the particular product. Generally these are main dissimilarities among these methods:

- Target costing is applied during design stage of product while kaizen costing is applied during manufacturing stage of product life cycle.
- Target costing is effective mainly for new products while kaizen costing is effective for existing products.
- Target costing focuses on improvements of the product design and cost reduction while kaizen costing focuses on processes and cost reduction by making the production processes more efficient.
- The potential cost reduction is less in kaizen costing because the products are under manufacturing stage of their life cycles while a large portion of the product costs is locked in design stage therefore potential cost reduction is high in target costing.
- In target costing engineers role is more important than shop floor workers while in kaizen costing shop floor workers role is more important than engineers.
- Target costing concept uses the term target cost or allowable cost while kaizen costing uses the term cost targets or cost reduction targets or kaizen targets.
- Target costing is more suitable for short life cycle products while kaizen costing focuses more on long life cycle products.
- Target costing uses value engineering tool to analyze and evaluate the cost structure and customer value of a product while kaizen costing uses value analysis tool. Though literature said value engineering and value analysis are used as one tool but under different names in target costing and kaizen costing.
- Target costing is focused on getting long-term profits whereas kaizen costing is helpful in attaining short-term profit goals.
- Target costing concept has wide scope than kaizen costing. According to some authors kaizen costing is the part of target costing.
- Target costing considers and directly related with customer satisfaction, market prices and profits but kaizen costing is not directly related with customer satisfaction, market prices and profits, it just considers internally persistent cost reduction.
3.3.8 EVALUATION OF THE METHODS

Total cost management methods target costing and kaizen costing give opportunities for cost reduction. Japanese automobile companies are been using these methods for more than 30 years. The users of these methods should be familiar with these methods and the conditions to apply these methods such as they must understand the basic nature of these methods and knowledge about the strength and weaknesses of these methods. In the light of literature it is observed that target costing and kaizen costing as a combined cost management system have some strengths and weaknesses which are showed in the following table:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Involvement of all members</td>
<td>• More stress on members</td>
</tr>
<tr>
<td>• Continuous improvement</td>
<td>• Problem to motivate employees</td>
</tr>
<tr>
<td>• Dynamic or adequate flexibility</td>
<td>• Difficult to implement and understand</td>
</tr>
<tr>
<td>• Comprehensive or wide range</td>
<td>• Different programs and can remove the individual effects</td>
</tr>
</tbody>
</table>

Table 3.3.2: Strengths and weakness of costing techniques

Source: Adapted from Bayou & Reinstein (1998)

3.3.9 TEAM INVOLVEMENT IN TOTAL COST MANAGEMENT

The cross-functional team structure is the critic component for the implementation of target costing and kaizen costing. Target costing and kaizen costing successful implementation depend on the employees of different departments of the company. Literature said that motivational consideration is very important for well execution of these techniques in company. Target cost and kaizen cost targets can be met by the company through the assignment and decomposition of total target costs and kaizen costs among different departments. The amount of kaizen cost targets must not be affected by the organizational power instead of this self control autonomous involvement should be prevailed. Targets should be determined through consultation between managers and
other members. For target costing and kaizen costing proper application, each employee must adjust and work for cost reduction optimistically thus company needs to motivate employees by different incentives such as information provide to employees, cooperation etc. Target costing and kaizen costing require people involvement at all levels members of the company for successful implementation of Japanese total cost management system. The involvement of key departments in total cost management is enumerated in the following figure.

![Diagram of Total Cost Management](image)

**Figure 3.3.7:** Involvement of various departments in total cost management  
**Source:** Own calculation of the researcher

### 3.3.10 TOTAL COST MANAGEMENT AND SUPPLY CHAIN

The present economic environment of globalization, high competition, empowerment of customers and new technologies demands the effective supply chain for sustainable competitive advantage. Many studies showed that inter-organizational relationships have high possibility to effect on the performance of the organization (Anderson & Dekker, 2005). In today’s global and competitive environment manufacturing organizations must consider both their internal activities as well as relationships with their supply chain partners. Effective management of costs beyond the organizational boundaries has the potential to get better the overall performance of each organization covered under firm’s supply chain. The domain structure of inter-organizational relationships is argued to be
critical for the success of firm (Ittner et al., 1999). Effective inter-organizational relationship appear to be a source of competitive advantage. Control systems might play a central role in relationship management to the benefit of all parties (Hutt et al., 2000). Traditionally the management control focused on control of single firm within the supply chain (Degraeve & Roodhooft, 2001). Previous studies showed that firm’s information technology integration is an enabler of supply chain effectiveness. Supply chain development necessitates the involvement of members both internal and inter firm members and their relationships. The old costing methods ignored the supply chain perspective and cost information across supply chain.

Mostly management accounting practices have limited scope to the boundaries of the firm. This limitation creates difficulty for the firm to take benefit of any cost reduction synergies which exists within the supply chain members’ relations. Cost reduction synergies can only be achieved by coordinating the activities of several firms. Inter organizational cost management approach focuses more on customers and suppliers for the increased profitability. Because satisfied customers are less sensitive to price, they attract other customers, and on time, less costly and good quality raw material to deal with such type customers are provided by suppliers as main element for the production.

Competing only with price is dangerous. Globalization has increased the complexity to almost every aspect of the business and in this supply chains are the most recent to be affected. Many company failed due to rapidly changing market expectations. Companies are expected to chase both effectiveness and efficiency, and the combination of these two aspects demand sound trade-off between cost control and customer value.

Nowadays any organization can no longer proficiently compete in isolation of their customers, suppliers and other parties of supply chain therefore, whole supply chain must be viewed as one system. It implies that companies across the supply chain must work together to build the entire supply chain competitive. This goal can be attained by integrated and coordinated activities and processes across the entire supply chain through information exchange and enhanced collaboration (Lummus & Vokurka, 1999). Today organizations should be flexible because the supply chain is being unpredictable. It is clear that effective cost management necessitates strong collaborative supply chain
relations. These raise coordination and trust building importance rather than formal control across the organizational boundaries.

### 3.3.10.1 INTER ORGANIZATIONAL COST MANAGEMENT

Cooper & Slagmulder (2004) defined inter-organizational cost management as a set of activities, processes, or techniques that managers can use to manage costs that span organizational boundaries. The outcomes allied with inter-organizational cost management approach are usually provided by supply chain integration by identifying new ways of reducing costs and increasing profit through activities such as joint inter-organizational cost investigations and joint product development (Cooper & Slagmulder, 2004). Working with the approach of inter-organizational cost management creates opportunities for new competencies through joint learning, creating legitimacy, market power and moving speedily into new markets and technologies (Eisenhardt & Schoonhoven, 1996). However, all inter-organizational cost management activities perform in cooperative manner and have a common goal to generate value for all partners in supply chain (Coad & Cullen, 2006). Coad & Cullen (2006) reported that inter-organizational cost management is an institution that is based upon skill, relationships, knowledge, physical assets and the ability to learn and change.

Previous studies highlighted two major factors that influence inter-organizational cost management are: (1) the manufacturing firm’s information technology integration with supply chain partners and (2) capabilities and practices of the firm’s existing internal cost management system. The extreme focus of manufacturing firms is on integration with their supply chain members because it can give incremental improvements in productivity by reducing the overall costs. Internal and external information technology integration increase the sharing of information and it is a central part of inter-organizational cost management (Coad & Cullen, 2006). Information technology or electronic integration provides the physical framework that facilitate inter-organizational cost management and other factors such as individual knowledge and skills also affect inter-organizational cost management (Coad & Cullen, 2006). Communication, trust and relationship that exist between supply chain partners have been characterized as deemed requisite for the growth of inter-organization capabilities (Coad & Cullen, 2006).
internal focus of firms can make it difficult to take advantage of cost synergies that may be obtained by the collaboration and teamwork with supply chain partners. These synergies require coordination beyond organizational boundaries with the general objective of finding lower cost solutions (Cooper & Slagmulder, 1998). Traditionally organizations ignored supply chain activities that can be performed in terms of cost, time and quality (Lalonde & Pohlen, 1996). Dekker & Van (2000) acknowledged the significance of cooperative relationships within the supply chain. Inter-organizational cost management has emerged as a practice which is specifically targeted integrating cost management systems to attain jointly costs reduction between supply chain partners (Cooper & Slagmulder, 2004). According to Cooper & Slagmulder (1998) inter-organizational cost management practice facilitates cost reduction by coordination in generally two ways: first by identify new ways to make efficient boundary between the firms and second by identify additional ways to reduce the costs of products. In literature commonly discussed inter-organizational cost management practices are: Inter organizational target costing, inter organizational kaizen costing, open book accounting and information sharing.

**Inter Organizational Target Costing:**

Target costing focuses on development and design processes costs management of a firm (Cooper & Slagmulder, 1997). The previous studies recommended target costing as an internal cost management technique (Cooper & Slagmulder, 2004). The key expansion of target costing that brings it into the sphere of inter-organizational cost management is the active involvement of both firm and its supply chain partners in the joint identification, management and resolution of cost issues (Cooper & Slagmulder, 2004). Cooper & Slagmulder (2004) explained three specific factors for inter organizational target costing to develop relationship between firm and its supply chain partners as: (1) functionality-price-quality tradeoffs to solve minor cost problems, (2) inter organizational cost investigation and (3) concurrent cost management for significant interaction and collaboration that can be useful for essential changes in firms’ products and processes. The target costing process gives importance to design information to meet the target price of a product and the design information can be used by the supply chain partners of the firms to identify possibilities of cost reductions.
Inter Organizational Kaizen Costing:

Kaizen costing is an approach of incremental and continuous cost improvements of the product during manufacturing process (Monden & Hamada, 1991). Kaizen costing has inter-organizational cost management application because firm can use kaizen costing to recognize and to set cost-reduction goals for its suppliers (Cooper & Slagmulder, 1998). The factual benefit of inter organizational kaizen costing is finding the new low cost solutions with supply chain cooperation which cannot be identify in isolation (Cooper & Slagmulder, 1998).

Open Book Accounting:

In this practice supply chain partners open their internal accounting information for each other to for active collaboration, partnership and to build relations (Berry & Ahmed, 1997). The open-book accounting of supply chain partners facilitate a mutual working approach for innovation throughout the whole supply chain. This assists in obtaining actual cost and other valuable data to each main party of supply chain. Then members of supply chain are involved in sensible way about possible changes in product and their costs. Without this there may be problem in smooth running of production systems.

Information Sharing:

The expansion of information technology boosts coordination between members of supply chain. The Japanese automobile companies gave more importance to information technology. Probably this is important factor for inter organizational cost management and development of target and kaizen costing systems. The expansion of information technology makes the supply chain and market more opened and accessible. This practice covers identification of precise information and organizational processes that can assist inter organizational cost management (Kulmala et al., 2002).

3.3.10.2 SUPPLY CHAIN MANAGEMENT

Supply chain management concept evolved in the early 1990’s. Supply chain management has become essential to companies in increasingly competitive global markets. Supply chain refers to the whole network of firms that work together to design, produce and deliver products. A supply chain is a network of operating entities through which an organization delivers products or services to a particular customer in market
Supply chain management is a collaborative, cross-enterprise operating strategy that aligns the flow of incoming materials, manufacturing and downstream distribution in a manner responsive to changes in customer demand without creating surplus inventory (Cooper & Ellram, 1993). Supply chain management may be defined as a group of suppliers, manufacturers, warehouses and stores so that material is converted into products, distributed at the right quantities to the right locations and at the right time in order to minimize costs, while satisfying customers requirements. Supply chain management integrates supply and demand management within the companies and across the companies. All supply chains generally contain three core elements: suppliers, producers or manufacturers and customers. Not all but many supply chain also contain distributors and retailers as supply chain partners. The supply chain partners and the flow of information and products or services is demonstrated in the following figure. The figure shows that suppliers, producers, distributors, retailers and consumers are the pillars of supply chain and each partner has their own specific place and important role in this chain.

![Flow of products and Services](image)

**Figure 3.3.8**: Relationship between supply chain partners

**Source**: Adapted from APICS/CPIM (1997)

Whatever the composition the elements of a supply chain in companies must operate in a coordinated manner. Products and services generally flow from source of supply to source of demand while information and cash payments generally flow in the reverse direction. The objective of supply chain management is to be efficient and cost effective.
across the entire system taking into account costs from transportation, distribution to inventories of raw materials, work in process, and finished goods. A fundamental principal of supply chain management is that organizations must look across their own boundaries to consider relationships with supply chain partners mainly customers and suppliers (Berry & Ahmed, 1997).

In past companies gave importance mostly on manufacturing and quality improvements within the organization but now the efforts of companies have extended beyond their organizational walls to cover the entire supply chain (Ansari & Bell, 1997). Effective supply chain management provides the following benefits to company: appropriate inventory levels, predict shifts in demand, short cycle times, fast delivery, pricing, rapid response to market opportunities (Cooper & Slagmulder, 1997). In supply chain management competitive pressure of firm is transmitted to other firms within the supply chain and each firm of the supply chain acts for own and other firms benefits (Cooper & Slagmulder, 1999). This leads mutual support between the supply chain partners/networks even when firms are in direct competition with each other.

3.3.10.3 SUPPLIERS INVOLVEMENT AND COSTING SYSTEMS

Suppliers play vital role in the cost reduction of product and the suppliers involvement during development and production stage of product is very critical point and it is covered under both target costing and kaizen costing methods. Nishiguchi & Brookfield (1997) revealed that automobile companies can jointly reduce the total costs of product parts with their suppliers. The relationship of target costing and kaizen costing with the supply chain during their processes is one of the major issues. Literature highlighted the involvement of suppliers during early design and after design stage of product and it creates the necessity of these costing methods. The wide collaboration with suppliers is very helpful in reducing the buyer’s research and development costs up to 15% (Cooper & Slagmulder, 2004). Especially automobile companies involve suppliers to speed up and rationalize the development process (Ittner et al., 1999). Especially the manufacturing phase of the product is subject to many joint cost reductions. Purchased parts of products cover more than 60% in average of the total manufacturing costs of company (Degraeve & Roodhooft, 2001). It is common practice to work with a fairly
small number of suppliers. Continuous relations with suppliers are prerequisite for achieving advance cost reduction therefore, firm should build continuous relationships with their suppliers. Suppliers’ involvement in each stage for both target costing and kaizen costing is highlighted through the following figure.
Figure 3.3.9: Role of supply chain partners in target costing and kaizen costing

Source: Adapted from Ellram (2006)

The integrated process shown in figure 3.39 presents a very close linkage between supply chain management and the functions/processes of both the target costing and kaizen costing. Target costing and kaizen costing require high levels of trust, transparency and continuity among supply chain members through applying the thought all for one which guarantees, supply chain members satisfactory profitability. Hence, team aspect is important for cost advantage. For cost reduction during each phase of product life cycle past and current performance of suppliers are less relevant than their potential performance for further development and improvement.

Companies today cannot work successfully themselves in isolation. Suppliers involve during earlier stage of production and they can contribute and participate through their ideas for alternative design, providing new technology, estimates of the selling prices, their feedback and steps in the design and development process or in the process of target costing. Suppliers also provide their ideas during manufacturing phase or in the process of kaizen costing. Hence, suppliers play significant role in total cost management or in the application of both target costing and kaizen costing. Therefore, specially manufacturing companies have to reward their suppliers time to time for their contribution. Total cost management has become increasingly important as companies look for new ways to better manage their costs by selecting the efficient suppliers and by maintaining relationships with them (Bhutta & Huq, 2002). Suppliers are motivated to achieve goal of low costs under the inter-organizational social pressure expected by the manufacturers. The cost reduction before manufacturing phase and after this phase is influenced by commercial negotiations between outside party, supplier’s sales department and internal party manufacturer’s purchase department.

Suppliers play a vital role in total cost management. The continuous improvement approach kaizen costing picks up where target costing leaves off and it focuses on improving the product cost after the product has been introduced in the market place (Williamson, 1997). Involvement of suppliers in target costing process during new product development is essential but after product development involvement of suppliers for continuous improvement by kaizen costing process helps a firm in cost reduction.
Different parties and departments such as research & development, suppliers and customers involve in different ways for total cost management in target costing and kaizen costing integrated process. Suppliers play major role in both target costing and kaizen costing. Suppliers should be carefully selected. Cooper & Slagmulder (1997) covered three factors reputation, competitiveness of bids and degree of innovation for choosing suppliers. Cooper & Slagmulder (1997) described that if firm has more power over its suppliers then it can avail greater benefits. The cooperation between firm and its suppliers provides combine design creativity and cost reduction. However, in contrast adversarial supplier relations can destroy the opportunities of competitive advantages (Cooper & Slagmulder, 1997).

### 3.11 COST IMPROVEMENT, COST CUTTING & COST SHIFTING

Target cost management can follow three routes for cost management. According to Bayou & Reinstein (1998) target cost management is a philosophy to attain predetermined goals and to reach preset goals, and it has three routes for cost management which are: cost improvement, cost cutting and cost shifting. Generally cost improvement, cost shifting and cost cutting are related terms. Cost reduction and cost improvement are also related concepts and have dependence on one another (Bayou & Reinstein, 1998). These three ways of target cost management is shown in the following figure.

![Figure 3.3.10: Three routes of target cost management](image)

**Source:** Adapted from Bayou & Reinstein (1998)

Cost reduction often results of cost improvement, however cost improvement may not be always lead cost reduction (Bayou & Reinstein, 1998). Cost improvement may enhance
costs for example during design phase for upgrading features of product, use of new cost structure may increase costs. Bayou & Reinstein (1998) expressed that the term cost reduction represents only that situation when it follows or results of cost improvement and without cost improvement reduction in cost, they called it cost cutting or cost shifting. Cost improvement is attained through total cost management with the use of both target costing and kaizen costing. These three concepts cost improvement, cost cutting and cost shifting are different each other. The process of change in product quality, functionality and components or parts may be influenced by any of these three ways. When basic strategies for cost improvement are not followed then cost cutting and cost shifting ways are used (Bayou & Reinstein, 1998).

**Cost Improvement:**
This means reduce cost of product with its quality improvement. In this way cost of some parts of product may increase while cost of some other parts of product may decrease to get the good quality product but total cost of all parts of product constitute low cost through use of total cost management techniques namely target costing and kaizen costing. This is actual the way of cost reduction (Bayou & Reinstein, 1998). This way focuses on both cost, non cost elements of product, decreasing both avoidable and unavoidable inefficiencies and use of new strategies like redesign means change in the form of product, restructuring means change in production systems (Bayou & Reinstein, 1998).

**Cost Cutting:**
Cost cutting is the movement down in the same cost line (Bayou & Reinstein, 1998). According to Bayou & Reinstein (1998) this way leads to use reduction in quantity of resources such as quantity of raw material, number of workers etc. for low cost production which is demonstrated in the figure 3.3.11 that by reduction in resources the cost of product can be reduced from one point to another point on the same cost line without improvement in the quality of product.

**Cost Shifting:**
Cost shifting switches to different types or qualities of resources in the manufacturing process and it is leap from one cost line to another (Bayou & Reinstein, 1998). According to Bayou & Reinstein (1998), this way leads to use low quality resources or this way does
not decrease the quantity but it decreases the quality of resources used to reduce cost of the production such as low grade raw material, less skilled workers and sub standard equipments, this is demonstrated in figure 3.3.11 that by use of sub standard resources cost of product can be moved from cost line 1 to comparatively low cost line 2. The difference between cost cutting and cost shifting is presented through following figure.

**Figure 3.3.11**: Difference between cost cutting and cost shifting

**Source**: Adapted from Bayou & Reinstein (1998)

Cost shifting differs from cost cutting because cost cutting is a movement downward on the same cost curve while cost shifting is a jump from one cost curve to another cost curve. Bayou & Reinstein (1998) used three tendencies suggestive, assertive and evasive for these three terms. Cost improvement is suggestive, cost shifting is evasive and cost cutting is assertive (Bayou & Reinstein, 1998). Cost improvement is suggestive because it incorporates suggestions and recommendations made by top management, research & development, marketing, accounting, manufacturing and other departments. Cost cutting is assertive because the decisions of cost cutting are imposed by top management on departments and employees, without sufficient justification and their participation, in order to increase profits or reduce losses. Cost shifting is evasive because it moves from the current cost curve to a totally different cost curve without any strategic improvement. Cost reduction and cost control or maintenance are also different concepts. Cost reduction generally includes active steps to decrease both upstream and downstream costs of products while cost maintenance includes steps to maintain the present cost of product.
Figure 3.3.12: Overview of the combination of target costing and kaizen costing

**Source:** Own calculation of the researcher

Usually cost reduction is considered by the firms during product planning and design stages while cost control at the manufacturing or production stage. Hence, cost reduction is the result of improved design and production processes with can be availed by any manufacturing company with the application of total cost management, specific techniques target costing and kaizen costing and cost reduction is very essential for the survival of a company in the global competitive environment. Finally the combination of target costing and kaizen costing techniques leads total cost management which is presented in the figure 3.3.12. It is noted that target costing and kaizen costing perform in different stages of product life cycle, for different products, with specific tools and with the involvement of all employees, managers and supply chain partners.