

# **CHAPTER -I**

## **INTRODUCTION**

### **1.1 Background of the Study**

The importance of industrialization as means of economic growth and prosperity is very great. In the process of economic development, industrialization is the key factor. It offers the prospects for the expansion of employment and income opportunities. New innovations and technical changes are generated by the industrialization that brings shifts in the production frontier by accelerating growth and factor productivities. The developed countries of the world have achieved economic prosperity by the rapid industrialization. This apparently reflects the tremendous significance of industrialization. Industrial development is deeply associated with some aspects like agriculture, trade, transport, state policy, and human attitude and efforts. However, there are many fluctuations on the way of industrialization. Nepal is in the process of industrial development. It is still in an infant stage and struggling to get returned. The contribution of manufacturing sector to GDP is estimated to be less than 10 percent. Nepalese economy still depends mainly upon agriculture.

Long term sustainable development of any country, directly or indirectly, depends on the promotion and growth of trade and industries. For the development of a country, trade and industry are the key factors. The life of trade and industries depend on the efficient utilization of limited resources. The business and industrial enterprises are initiated by the entrepreneurs who have long term vision and skills. To initiate the business and industrial enterprises, the cost plays a vital role. Every business forms or industries must bear cost to run day to day business activities. So, cost is an unavoidable factor for business firms. Every trade organization is worried about management of cost in its daily operation. To manage cost is very challenging job for every organizations. In developed countries, management of cost and application of cost reduction tools are also very challenging tasks. In the developing countries like Nepal, business firms are said to be losing their competitiveness due to higher cost. Most of the organizations are not using the cost reduction tools in Nepal. So, they are suffering from loss every year. As Nepal is entered into WTO,

Nepalese manufactures have to face high competition. Free entrance of highly quality based cheap products is main headache for Nepalese entrepreneurs. Due to this, Nepalese products are less competitive with the products of other countries made of highly sophisticated technologies with lower price. This is the main challenging issue for Nepalese organizations. So, it has been essential manufacturing enterprises to apply the cost reduction tools effectively and efficiently.

To remain competitive in today's global markets, business must continuously improve. Moreover this continuous improvement needs to apply across the spectrum of business activity: from product design and quality through production operation and cost management, to customer service. Continuous improvements may be defined as the constant effort to eliminate the waste, reduce response time, simplify the design of both product and process and improve quality of customers' service. One compelling reason for the need for continual improvement is the price down cost concept. This refers to the tendency of price to fall over the life cycle of the newly introduced product, (Hilton, 1997: 264).

Application of cost reduction tools means managing of limited resources to produce high efficiency. It consists of those actions which are taken by manager to reduce costs. Cost reduction activities, taken by manager, are based on two criterions. One criterion of actions is prioritized on the basis of information extracted from the accounting system. Other actions however are under taken without the use of accounting information. They involve process involvements where an opportunity has been identified to perform process more effectively and efficiently and which have obvious cost reduction outcomes. Nowadays every organization is facing the challenges of competition. Success is not a matter of chance. In very comfortable and affordable price, production of qualitative product is very challenging job. It is not very hard, if organization use the cost reduction tools. So, management of cost by using cost reduction tools is necessary in every business organization.

The research work, 'Application of cost reduction tools in Nepalese manufacturing originations is not a case study. It is a survey study on many manufacturing industries situated in Kathmandu Valley. There are so many manufacturing industries in Kathmandu valley. Some of them are running successfully and some of them are in critical condition. Those who are running successfully are called healthy industries. And those who are in the situation of do or

die are called unhealthy organization. There are so many causes of success or failures. Among them, cost is main factor. Only qualitative goods cannot be sold due to high cost. So, reduction of cost is very much essential. Most of the Nepalese organizations are facing such high cost problem. Now, this research work is going to explore and examine whether or not the Nepalese organizations are using cost reduction tools? So, it mainly focuses on the manufacturing organization in terms of application of cost reduction tools.

## **1.2 Relevance of the study**

Every day we hear news regarding the shut-down of many big corporations. Although the reason whatever, the cost be sometimes explained reasonable. Every business organization wants its contribution in society. It wants to niche at least a sustainable margin for it. But it is not reachable when organizations fail to manage its cost. Then it becomes very miserable condition for organizations. Most of organizations think that to purchase at lower price from supplier is only the key factor to reduce the cost. But in fact, it is a little effort to reduce the cost not at all. There are so many other tools/mechanisms to reduce the cost. So, application of suitable cost reduction tools is important. This research work is significant in terms at exploring and examining the cost reduction tools applied by Nepalese manufacturing organization. So, the outcome of this research work is equally important to generate the knowledge to researcher as well as Nepalese organizations.

## **1.3 Statement of the Problems**

The main problem of Nepalese manufacturing organization is incurrence of high cost during the product production process. Due to this, many of the firms are being shut down. It is a very miserable condition for industry as well as nation also. Most of the organizations think that they have to buy raw materials in very low cost from their suppliers. The purchase manager only concerns with this topic. So, other managers show less responsibility toward cost minimization. This is why organizations have to face high cost problem. This is not only the one's responsibility. As we know, there are so many cost centers in one manufacturing organization. All cost centers should be responsible for managing the cost. So, management should know that using many cost reduction tools other than direct bargaining for costs with the suppliers can reduce cost of goods and services. Lack

of well educated human resources and experienced management team are the problem in every business firms.

In the above context, the research work intends to explore the following questions.

- Do knowledge of cost reduction tools affect in the application of the tools?
- What is the manager's attitude to use such tools?
- To what extent do organizations apply cost reduction tools?

#### **1.4 Objectives of the Study**

The main objective of the study is to evaluate the application of the cost reduction tools in Nepalese manufacturing organizations. In order to meet the main objective of the study, the following sub objectives have been proposed.

- To explore the current state of application of the cost reduction tools in Nepalese manufacturing organizations.
- To identify the practical difficulties for applying cost reduction tools in Nepalese manufacturing organizations.
- To know the view regarding application of cost reduction tools in organizations.
- To provide suggestions and recommendation for the betterment of cost reduction.

#### **1.5 Limitations of the Study**

- The study focuses only the manufacturing organizations based in Kathmandu valley.
- The study is based on the application of selected cost reduction tools only.
- The research is mostly based upon primary data provided by the respondents. So, the reliability of the conclusion highly depends upon respondent's responses.
- The status of the application of cost reduction tools analyzed in this research work is based on the data collected at the time of unit visit. Hence, this research work is not incurred the status before and after the visit.

## **1.6 Organization of the Study**

The research report has been divided into five different chapters.

### **Chapter I- Introduction**

The introduction chapter consists of the background of the study, relevance of the study, objective of the study, statements of the problems, limitations of the study and organization of the study.

### **Chapter –II- Review of Literature**

This chapter deals with conceptual review, review of previous related studies and research gap.

### **Chapter- III- Research Methodology**

Research methodology chapter contains research design population and samples, sources of data collection techniques and data analysis tools.

### **Chapter- IV- Data Presentation and Analysis**

This chapter deals with data presentation and analysis with the help of various tools, graphs and diagram. Major findings of the study are also presented in this section.

### **Chapter –V- Summary, Conclusion and Recommendations**

The last chapter of research report contains summary, conclusion and recommendations of the study.

# **CHAPTER – II**

## **REVIEW OF LITERATURE**

This research work relates to the application of cost reduction tools in Nepalese manufacturing organizations. Accordingly, literature review relates to the following:

- Conceptual review.
- Review of previous studies

### **2.1 Conceptual Review**

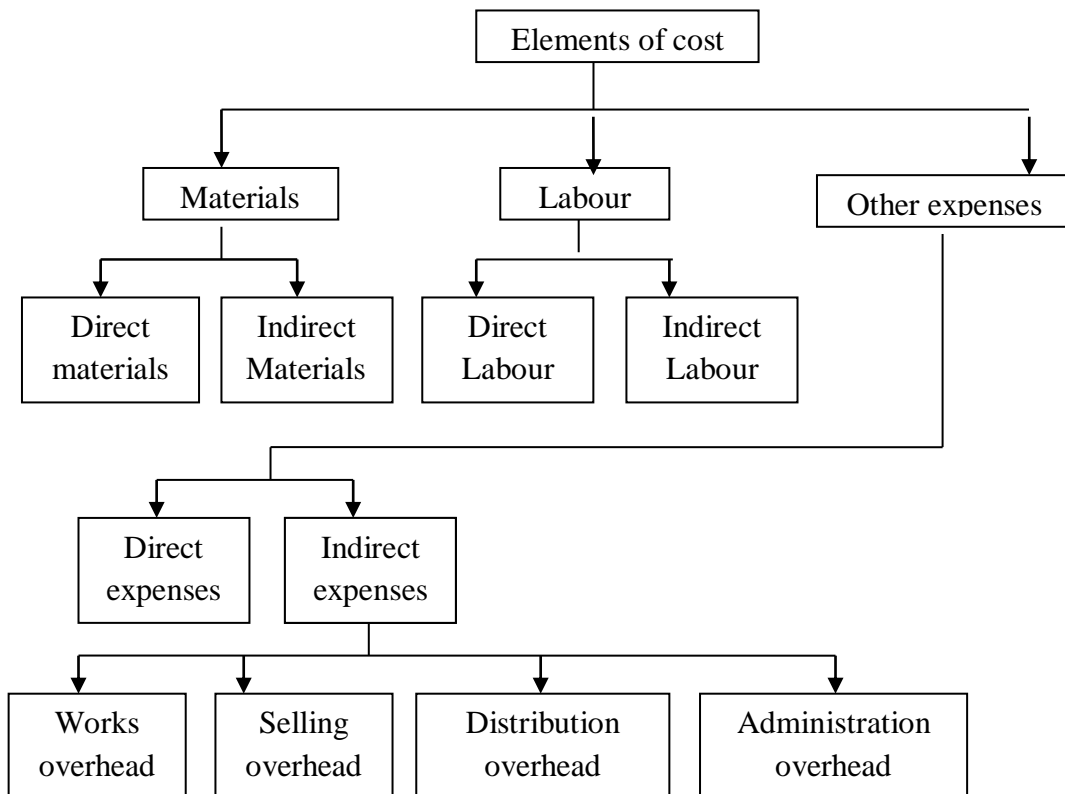
#### **2.1.1 Concept of cost**

Cost is the amount of expenditure actual (incurred) or national (attributable), relating to a specific thing or activity, may be a product, job service, process or any other activity. Cost is the amount of resources given up in exchange for some goods or services. The resources given up are generally in terms of money or if not in terms of money, they are always expressed in monetary terms. The terms of money or if not in terms of money, they are always expressed in monetary terms. The terms 'cost' itself is without any significant meaning and therefore, it is always advisable to use it with an adjective or phrase that will convey the meaning intended such as prime, direct, indirect, fixed, variable, controllable, opportunity, imputed, sunk, differential, marginal, replacement and the like. (lal, 1996:23).

Accountants, economists, engineers and others facing cost problems have developed cost concepts and cost terminology according to their needs. Basically a concept should be stated in the terms in which it has become generally familiar. It is not easy to define or explain the terms cost leaving no doubt concerning its meaning. The committee on cost concepts and standards of America Accounting Association wrote; "cost is foregoing, measured in monetary terms, incurred or potentially to be incurred to achieve a specific objective. In a tentative set of board accounting principles for business Enterprises "cost" is defined as an exchange price, a foregoing, a sacrifice to secure benefit. In financial accounting, the foregoing, or sacrifice at date of acquisition is represented by a current or future diminution in cash or other assets"(Matz/cury; 1972:39)

### 2.1.2 Elements of Cost

For the purpose the total cost is normally analyzed by the element of total cost i.e. by the nature of expenses. Broadly speaking the elements of cost is three in numbers Viz, materials (stores) labour (wages) and overhead (other expenses). (Swaminathan; 1978:22)



The elements that enter into the cost of quality are direct materials, direct labour, and manufacturing overhead. The elements that enter into the creation of a particular business or municipal service are essentially labour or payroll cost and variety of overhead or indirect costs. (Neuner; 1957: 5)

### 2.1.3 Calcification of Cost

Classification is the process of grouping cost according to their common characteristics. It is a systematic placement of like items together according to their common features. (Dangol, 2062:20).

There are many objectives of cost classifications depending on the requirements of management. However, the following objectives are considered very useful and significant.

- i. Determining product cost for stock valuation and profit measurement.
- ii. Planning
- iii. Decision making
- iv. Control, (Lal, 1996: 20).

## **1. Natural Classification of Cost**

### **a. Direct Materials**

The direct materials are all materials that become a part of the product. The costs of which are directly charged as part of the prime cost. In other words, it is the material which can be measured and charged directly to the cost of product. (Owler and Brown; 1960:80)

### **b. Direct labour**

Direct labour is all labour expended in altering the construction, composition, conformation, or condition of the product. The wages paid to skilled and unskilled workers for this labour can be allocated specifically to the particular cost account concerned-hence the term “Direct wages”, which may be defined as the measure of direct labour in terms of money. (Owler and Brown; 1960: 8)

### **c. Direct Expenses**

Direct expenses include any expenditure other than direct materials or direct labour directly incurred on a specific cost unit. Such special necessary expenses are charged directly to the particular cost account concerned, as a part of prime cost. (Owler and Brown; 1960:8)

### **d. Factory Overhead**

Factory overhead also called manufacturing expenses or factory burden may be defined as the cost of indirect materials, indirect labour and indirect expenses. (Lal; 1996: 27)



**e. selling, distribution and administrative overhead**

Selling and distribution overhead usually begin when the factory cost end. Such expenses are generally incurred when the product is in saleable condition. It covers the cost of making sales and delivering/dispatching product. (Lal; 1996: 27)

**2. Cost Behavior (In Relation to Changes in Output, Activity or Volume)**

**a. Fixed cost**

Fixed cost is cost which does not change in total for a given time period despite wide fluctuations in output or volume of activity. These are also known as standby costs; capacity cost or period cost fixed costs can be classified in the following categories for the purpose of analysis. (Lal; 1996: 28)

**i. Committed cost/capacity cost**

Fixed cost caused by purchase of capacity producing assets such as plant or equipment are called committed cost e.g depreciation of plant equipment, insurance premium. (Khan and jain; 1997: 147)

**ii. Discretionary Cost**

They are also known as programmed costs. Discretionary cost resulted from special policy decision, management programs, new researches, R and D cost, new system development costs are example of discretionary cost. (Lal; 1996: 29)

**iii. Management Cost**

Management costs are related to current operation which must continue to be paid to ensure the continued operating existence of the company e.g. Management and staff salaries. (Lal; 1996: 29)

**iv. Step Cost**

A step cost is constant for a given amount of output and then increase in a fixed amount of a higher output level. (Lal; 1996: 29)

## **b. Variable Cost**

Cost that tend to vary total in direct proportion or in a one to one relationship to changes in production activity, sales activity or some other measure of volume are referred to as variable costs.(Khan and Jain; 1997:151)

In view of their behaviors, variable costs are sometimes called “engineered costs”. An engineered cost is any cost that has an explicit specified, physical relationship with a selected measure of activities. (: Horngren; 1987: 206)

## **c. Mixed Cost**

Mixed cost are costs made up from fixed and variable elements. They are a combination of semi variable costs and semi fixed costs. Because of the variable component they fluctuate with volume, because of the fixed component, they do not change in direct proportion to output. Semi fixed costs are those costs which remain constant up to a certain level of output after which they become variable (Lal; 1996: 30).

## **3. Degree of Traceability to the Product**

### **a. Direct Cost**

Costs which are easily traceable or identifiable with a product are called direct costs. If output units are the objects of costing, then direct costs represents costs and resources that can be traced to or identified with the finished product. Direct labour, direct materials and direct expenses are example of direct cost. (Lal; 1996: 31)

### **b. Indirect Cost**

Indirect costs are those costs which cannot be identified with, or traced to a single product because they are incurred for several products. The examples are indirect materials, salary of factory supervisors etc. (Lal; 1996: 31)

## **4. Degree with Association with the Product**

### **a. Product Cost**

Product costs are identified with goods produced or purchased for resale. Product costs are initially identified as a part of the inventory on hand. These product costs (Inventorial costs) become expenses (in the form of cost of goods sold) only when the inventory is sold. (Horngren; 1996: 127)

**b. Period Cost**

Period costs are the expenses, which are recovered from the revenue of the period, normally. Expenses of general administration, selling and distribution cost and finance are treated as period cost. These costs are not necessary for production and hence, are called period cost. (Nigam and Sharma; 1992: 26)

**5. Functional Classification of Costs**

**a. Manufacturing Cost**

Manufacturing costs are all product costs incurred to manufacture the products and to bring them to a saleable condition, including direct materials, direct labour and indirect manufacturing (or factory overhead) costs. (Lal; 1996: 33)

**b. Selling and Distribution Cost**

Selling cost is the cost of seeking to create and stimulating demand and of securing orders. Distribution cost is the cost of sequences of operations which begins with making the packed product available for dispatch and ends with making the reconditioned returned empty package for reuse, it includes advertising, samples, warehousing cost, upkeep and running cost of delivery van. (Dangol; 2062:21)

**c. Administration Cost**

This is general administration cost and includes all expenditures incurred in formulating the policy directing the organization and controlling the operations of an undertaking, which is not directly related to production, selling, distribution and research and development activity of functions. It includes account office expenses, audit fees, bank charges, legal expenses, office rent, postage, telephone, rates and directors remuneration etc. (Dangol; 2062: 20)

**6. Relationship with Accounting Period**

**a. Capital Cost and Revenue Cost**

Cost can be divided into two board classes on the basis of accounting period to which they relate: i) capital expenditures and ii) revenue expenditures. A capital expenditure provides benefit to future periods and is classified as expenses. A capital expenditure will flow into the cost stream as an expense, when the asset is used up or written off. (Lal; 1996: 3)

## **7. Cost for Decision Making and Planning**

### **a. Opportunity Cost**

An opportunity cost can be defined as the potential benefit that is sacrificed when the choice of one course of action requires the giving up of an alternative course of action. Opportunity cost is not usually entered on the books of origination but it is a cost that be expertly considered in every decision that a management makes. (Garrison, 1985: 44)

### **b. Sunk Cost**

A sunk cost is the cost that has already been incurred. Generally known as unavoidable cost, it refers to all past cost since these amounts cannot be changed once the cost is incurred. They are the costs which have been created by a decision in the past and cannot be changed or avoided by any decision that is made in future. (Lal; 1996: 34)

### **c. Relevant Cost**

A cost which is influenced by a decision is relevant cost and hence is important for decision makers. Relevant cost in true sense is an incremental cost. (Khan and Jain; 1993: 162)

### **d. Differential Cost**

Any cost that is present under one alternative but is absent in whole or in part under another alternative is known as differential cost. (Garrison; 1985: 45)

### **e. Imputed Cost/Implicit Cost**

Implicit costs are those expenses, which cannot be proved for external reporting. These are not allowable for tax purpose. Implicit costs are implied in nature, which can just be understood, but may not need to be paid in cash at present or in future, for example, interest on owners, capital. (Bajracharya; et al; 2005:51)

### **f. Out of Pocket Cost**

While imputed costs do not involve cash outlays, out of pocket costs signify the cash incurred on an activity. Non cash costs such as depreciation are not included in out of pocket costs. This cost concept is significant for management in deciding whether

or not a particular project will at least return the cash expenditure associated with the project selected by management. (Lal; 1996: 36)

**g. Shutdown Cost**

Shutdown costs are those costs which have to be incurred under all situations in the case of stopping manufacture of a product or closing down a department or a division. Shutdown costs are always fixed costs. (Lal; 1996: 36)

**8. Cost for Control**

**a. Controllable Cost**

An item of cost is controllable if the amount of cost incurred in a responsibility center is significantly influenced by the actions of the manager of the responsibility center, otherwise it is non controllable. (Welsch,etal; 1977: 28)

**b. Non Controllable Cost**

Any cost that is not subject to change within the related responsibility center (lower level of management and within the short time span is called a non controllable cost.

**c. Standard Cost**

Standard costs are those costs which are planned or predetermined cost estimated for a unit of output in order to provide a basis for comparison with actual costs. Standard costs are used to prepare budgets. (Lal; 1996: 37)

**9. Cost Reduction Point of View**

**a. Costs That Add Value or Value Added Cost**

A value added activity is an activity that customers perceive as adding usefulness to the product or service they purchase. For example painting a car would be value added activity in an organization that manufactures cars. (Drnsy; 2000: 8-9)

**b. Costs That Do Not Add Value or Non Value Added Cost**

Non value added activities are operations that are either (i) unnecessary and dispensable or (ii) necessary but inefficient and immovable. Non value added costs, which result from such activities, are the costs of activities that can be eliminated

without determination of product quality, performance or perceived value. (Hilton; 1997:261-262)

## **10. Other Cost**

### **a. Joint Cost**

Joint costs arise where the processing of a single raw material or production resources result in two or more different products simultaneously. Joint cost relate to two or more products produced from a common production process or element material, labour or overhead or any combination thereof so locked together that one cannot be produced without producing the others. (Lal; 1996:37)

### **b. Common Cost**

Common costs are those which are incurred for more than one product, job, territory or any other specific costing object. Common costs are not easily identifiable with individual products and, therefore, are generally apportioned. (Lal; 1996:37)

#### **2.1.4 Cost Reduction**

Cost reduction may be defined as an attempt to bring costs down. Cost reduction implies real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their product or goods) suitability for the use intended. The goal of cost reduction is achieved in two ways: (i) by reducing the cost per unit and (ii) by increasing productivity. The steps for cost reduction include elimination of waste, improving operations increasing productivity; search for cheaper materials, improved standards of quality, finding other means to reduce unit costs. (Lal; 1996:1077)

Profit is the difference between the sale value and the cost of sales. Thus profit can be improved either by increasing the sale or reducing the cost or both. In most of the situations, sale value depends on market forces which can seldom be substantially influenced by managers. Usually, even a real increase in cost cannot be passed on fully to the customers and a portion of the cost is burned by the manufacture. Therefore, it is not always possible to improve profit by increasing sales value. Cost reduction is generally the only alternative for improving the profitability of a product. With all round increase in the cost of inputs and increase in completions,

cost reduction has assumed great importance is most of the organizations. (Bhattacharya; 1992:825)

Whilst cost control aims at reducing the actual to the target, cost reduction aims at reducing the target themselves. Viewed from this point, it can be said that cost reduction begins where control ends cost. The necessary for cost reduction arises when the profit margin has to be increased without an increase in the sales turnover, ie. For the same volume of sales the cost of sales should be reduced. If costs are already under control and represent more or less the targets set up, the problem arises as to how best the profit margin could be increased ie. what is the future step to be taken to reduce the target cost of production. This necessary leads us to cost reduction programs. Cost reduction is a dynamic function, a function which can see no end, in as much as no result can ever be taken as unlimited goal. The working of cost reduction program has rightly been compared by one author to a tiger hunt. (Swaminathan; 1978: 349)

Every organization has an objective to attain public undertaking strive for maximization of public welfare. However, maximization of profit is the overriding aim of enterprises in the private sector.

Cost reduction, in fact, is profit earning. It is essential for the survival of business. In a competitive economy increase of price may not be a sound policy. Consumers may stop buying product. It may even lead to increase in raw materials wages, and other costs. The result may be a vicious spiral where product price increases are followed by wage and other increased costs which in turn are followed by price increases. The solution lies in cost reduction. (Agrawal; 2026: 9)

Cost reduction, therefore focuses on the following:

- I. Real reduction in cost.
- II. The reduction should be of a permanent nature.
- III. It should not impair the suitability for intended use.

### **2.1.5 Cost reduction and Cost control**

Cost reduction and cost control is not the same thing. In cost control, actual costs are compared with planned cost and necessary corrective actions are taken where there are variations. It is mainly concerned with adhering to the set standards which are assumed to be the desired state of efficiency in a given set of circumstances.

Cost reduction, however, is concerned with genuine saving existing costs or standard are regarded as merely yardsticks and efforts are made to improve and change them in all sets of circumstances. The presumption is that genuine changes in costs are always possible. (Agrawal; 2026: 9)

Thus, cost reduction is different from cost control. Cost control refers to the mechanism to keep the cost within the established standard, whereas cost reduction challenges the established standard by focusing on the concealed potential saving in the standard. Cost reduction is not cost saving because cost saving may result from a short term decision and under a bad business situations the cost savings decision may even result in the temporary reduction in quality, where as cost reduction is always permanent in nature and never ignores the principle that the quality of product and its suitability for the intended use cannot be reduced in the process of cost reduction. (Bhattacharya; 1992:826)

### **2.1.6 Organization of Cost Reduction**

The cost reduction programs should be initiated and followed up by a cost reduction committee, which should be preferably, is under the chairmanship of an industrial engineer. This committee will also include the cost account of the organization who, as its financial adviser, will render advice on the various programs that are discuss the new programs to be taken up the progress made on the programs computes. In this connection it should be noted that the research and development project are slightly different from cost reduction programs. Research and development concentrate more on new products and improved methods, with the emphasis on increasing the utility of the product and its potentiality marketability. Cost reduction on the other hand aims at reducing the cost of production of the present manufacture and to increase the profit margined. (Swaminathan; 1996:350-351)



## **2.2 Area of Cost Reduction**

A cost reduction program should be all pervasive because cost reduction is attainable in almost all the areas of business activities. There can hardly be any area of operation, which cannot be improved. (Bhattacharya; 1992:286)

Some of the important cost reduction areas are as follows:

### **1. Production Design**

Product design offers the greatest scope for cost reduction of a permanent nature. Designing being the first step in manufacturing a product, the impact of a decision at these stages is felt throughout the manufacturing or processing of the product in the factory. The possibility of cost reduction should be investigated at the time of introducing a new design, as well as at the time of introducing any modification in an existing design. (Bhattacharya; 1992: 286)

### **2. Production Planning and Control**

Production planning and control (including materials planning and control) endeavors to achieve the best co-ordination among material, manpower and manufacturing facilities. So that delivery commitments are without causing waste of resources. (Bhattacharya; 1992: 287)

### **3. Plant Layout and Equipment**

Plant layout is the floor 'plan' which involves analysis and arrangement of equipments, Work station, and floor area to ensure most efficient utilization of equipments, plants facilities and plant services. A good plant lay out aims at reducing at the area covered by production facilities. (Bhattacharya; 1992: 827)

### **4. Factory Organization**

A considerable cost reducing can be affected by improving the factory organization. Though cost reduction resulting from an improvement in the organization cannot be measured, yet it has been undoubtedly established that economies can be achieved through improvements in the following areas. (Bhattacharya; 1992: 827)

- Improvement in the organization structure by defining functions and responsibility in clear terms.

- Improvement in communication among various management levels and between managers and workmen.
- Delegation of authority should be encouraged because it helps to achieve better supervision.
- The participation of employees in cost reduction programs.

## **5. Purchasing and Material Control**

Purchasing and materials control functions should be systematically investigated and the following important question should be asked and answered, (Bhattacharya, 1992:827).

- Are purchases being made at the right price?
- Is the material inspected as soon as it is received?
- Is there a proper system for the collection and dissemination of market (of raw materials and other inputs) information?
- Is there any scope of improving material handling? etc.

## **6. Marketing**

In marketing, the following are the cost reduction areas: channels of distribution, sales promotion schemes, marketing research plan, territorial, responsibilities, and methods of remunerating sales men, advertising methods, after sales service costs, packaging methods, material handling, and transport arrangement etc, (Lal; 1996:1078)

## **7. Finance**

The financial function aims at arranging fund most economically and ensuring the optional utilization of funds so arranged. Working capital provides sample scope for reducing cost because in most of the organizations the scope exists for reducing working capital cycle. Working capital can be reduced by identifying parallel operations, realizing debt without delay, by reducing inventory level through effective inventory control and by reducing for liberal credit from suppliers of materials and services, (Bhattacharya, 1992:829)

## **8. Administrative Function**

Administrative functions include personnel purchase and general administration. The goal of cost reduction requires efficient administration, effective purchasing procedure and a fair personnel policy and schemes. Some of the important areas are: investment planning, cash discount policy, mechanized system of accounting, labour relations, labour welfare measure, availability of servicing facilities, (Lal, 1996:1078-1079)

## **9. Direct Labour**

Some aspects that need systematic investigation to reduce the cost related to direct labour are:

- Scope for improving the time keeping system
- Scope for improving labour productivity through work study.
- Proper maintenance of equipment and tools.
- Need for supervision of standards so that they continue to be representative of the current conditions.

Scope for providing labour productivity through rationalization, training and use of other human resources development techniques etc, (Lal; 1996:1079)

### **2.2.1 Cost Reduction Program**

Cost control involves the comparison of actual results with per-determined standards. It is clear that for the control go be really effective, standards should be reviewed and revised periodically. An old standard might fail to represent the current conditions and a comparison of actual results with these would lead to misleading conclusions, (Bhattacharya; 1992:827)

The revision of standard requires implementation of a system, which in the light of intervening changes, would continually question the existing standard. This system covers short and routine cost reduction programs. Thus, short term and routine cost reduction program should form a part of the budgetary control/standard costing system, (Bhattacharya; 1992:830)

Long-term cost reduction schemes involved plans to deal with improving the efficiency in a particular field. The steps involve the identification of an area with the highest potential for cost reduction, a comprehensive survey to narrow down the area of investigation, application of cost reduction techniques and implementation of the accepted suggestions which might involve capital expenditure. For achieving expected results it is essential that the objective of a particular cost reduction program, the scope of investigation and responsibilities of the individuals involved to the program are clearly defined. (Bhattacharya; 1992:830)

### **2.2.2 Cost Reduction Committee**

There should be team work approach to cost reduction. In small concerns, cost reduction is the concern of all members of the staff and the initiative is generally taken by the higher levels management. (Agrawal; 2026:9)

However, in large scale concerns, a cost reduction committee should be set up to effect permanent savings. Its members should be drawn from research and development, productions and marketing departments with the cost accountant being the employees, personnel should know what products are beings produced along with a clear understanding of their cost structure. Cost centers with clear demarcation of responsibilities for the cost reduction should establish and the area for cost reduction programmed is essential to measure its effectiveness. (Agrawal; 2026:10)

Effective management and cost savings are interrelated. The survival of our industries very much depends on their “cost reduction” consciousness. In fact, it is essence of individual survival. (Agrawal; 2026:10)

## **2.3 Cost Management and Cost Reduction Tools**

Cost management focuses on cost reduction and continuous improvement and change rather than cost containment. Traditional cost control systems tend to be based on the preservation of the status quo and the ways of performing existing activities are not reviewed. The emphasis is on cost containment rather than cost reduction. Indeed the term cost reduction could be used instead of cost management

but the former is an emotive term. Therefore, cost management is preferred. Whereas traditional cost control system is routinely applied on a continuous basis, cost management tends to be applied on an ad-hoc basis when an opportunity for cost reduction is identified. Also many of the approaches that are incorporated with the area of cost management do not necessarily involve the use of accounting techniques. In contrast, cost control relies heavily on accounting techniques. (Drnsy, 2004:943-944)

Cost management consists of those actions that are taken by managers to reduce cost some of which are prioritized on the basis of information extracted from the accounting system. Other actions, however, are undertaken without the use of accounting information. They involve process improvements, where opportunity has been identified to perform process more effectively, and efficiently, and which have obvious cost reduction outcomes. It is important that organizations are aware of all approaches that can be used to reduce costs even if these methods do not really based on accounting information. Organization should also note that although cost management seeks to reduce costs, it should not be at expenses of customer satisfaction. Ideally, the aim is to take actions that will both reduce cost and enhance customer satisfaction. (Drnsy; 2004:945)

Manager commonly uses the following tools to implement the firm's broad strategy and to facilitate the achievement of success on critical success factors- Benchmarking, Total Quality Management, Continuous Improvement (Kaizen), Activity Based Costing, Reengineering, Theory of Constraints, Mass Customization, Target Costing, Life Cycle Costing and the Balance Scorecard. (Blocher; 1999: 16)

### **2.3.1 Benchmarking**

In order to identify the best way of performing activities and business processes organization are turning their attention to benchmarking, which involves comparing key activities with world class best activities and with world class best practices. Benchmarking attempt to identify an activity, such as customer order processing, that needs to be improved and finding a non-rival organization that is considered to represent world class best practice for the activity and study how it performs the activity. The objectives are to find out how the activity can be improved and ensure

that the improvements are implemented. Benchmarking is cost beneficial since an organization can save time and money avoiding mistakes that other companies have made and/or the organization can avoid duplicating the efforts of other companies. The overall aim should be to find and implement best practice. (Drnsy, 2004:9650)

Benchmarking is a process by which a firm identifies its critical success factors, studies the best practices of other firms (or other units within a firm) for these critical factors, and then implements improvements in the firm's process to match or beat the performance of those competitors. Benchmarking was first implemented by Xerox Corporation in the late 1970's. Today many firms use many benchmarking, and some of these firms are recognized as leader, and therefore, benchmarks, in selected areas. (Blocher; 1999:12)

Benchmarking efforts are facilitate today by cooperative networks of non competing firms that exchange benchmarking information, for example, the institute of management counting (IMA) has a continuous improvement center to help organizations benchmark and thereby improve their financial process. The IMA program includes accesses to a benchmark database; assistance is assessing CSFS, programs to assist firms in implementing improvements opportunities, and a recognition program that honors firms that achieve outstanding levels of continuous improvements. The Houston International Benchmarking clearinghouse also assists firms in strategic benchmarking. (Blocher; 1999: 13)

### **2.3.1.1 Process of Benchmarking**

The benchmarking process typically consists of five stages that include several organizational/diagnostic, operational, and informational factors. (Atkianson &Kaplan; 2004: 299)

#### **Stage-1 Internal Study and preliminary Competitive Analysis**

In this stage, the organization decides which key areas to benchmark for study For example, the company's activities, product methods etc. Then the company determines how it currently performs on these dimensions by initiating both preliminary internal competitive analysis using internal company data and preliminary external competitive analysis using for example industry comparisons of

quality from publications such as consumer reports or T.D. powers associates reports.

### **Stage-2 Developing Long term Commitment to the Benchmarking Project and Coalescing. The Benchmarking Team**

In this stage, the organization must develop its commitment to the benchmarking project and coalesce a benchmarking team. Because of significant organizational change, such as adopting a total-lift-cycle costing approach can take several years, the level of commitment to benchmarking has to be long term rather than short term. (Atkianson & Kaplan; 2004: 300)

### **Stage 3-Identifying Benchmarking Partners**

The third stage of benchmarking includes identification of partners-willing participants who know the process. Some critical factors are as follows. (Kaplan; 2004: 30)

1. Size of the partners
2. Number of partners
3. Relative position of the partners within and across industries.
4. Degree of trust among partners.

### **Stage 4- Information Gathering and sharing Methods**

Two dimensions relating to information gathering and sharing emerge from the literature (Atkianson & Kaplan; 2004:3020)

#### **i. Type of information that benchmarking organizations collect**

Firms interested in benchmarking can focus on three broad classes of information. Product benchmarking is the long standing practice of carefully examining other organizations' product. Functional (process) benchmarking is the study of other organizations' practice and costs with respect to functions or processes such as assembly of distribution. Strategic benchmarking is the study of other organizations' strategies and strategic decisions, such as why organizations choose one particular strategy over another. (Atkianson & Kaplan; 2004:302)

## **ii. Methods of information collection**

Management accountants play a key role in gathering and summarizing information used for benchmarking. These are two major methods of information collection for benchmarking. The most common can be described as unilateral (covert) benchmarking in which companies independently gather information about one or several other companies that excel in the area of interest. A second method is cooperative benchmarking, which is the voluntary sharing of information through mutual agreements. The major advantage of cooperative benchmarking is that information sharing occurs both within and across industries. Cooperative benchmarking has three subcategories: data base, indirect/third party, and group. (Atkianson & Kaplan; 2004: 302-303)

### **Stage-5 Taking Actions to Meet or Exceed the Benchmark**

In the final stage, the organization takes action and begins to change as a result of the benchmarking initiative. After implementing the change, the organization makes comparisons to the specific performance measures selected. In many cases, the decisions may be to perform better than the benchmark to be more competitive. The implementation stage, in particular the change process, is perhaps the most difficult stage of the benchmarking process, as the buy in of organizational members vs critical for success. (Atkianson & Kaplan; 2004: 303)

### **2.3.2 Total Quality Management (TQM)**

To survive and be successful in today's global competitive environment, firms must manufacture quality products and provide quality services. Quality products and services also enhance any competitive advantages a firm may have, (Blocher; 1999:166)

The ultimate test of quality product or service is whether the product or service meets or exceeds customers' expectations. The requirements to meet or exceed customers' expectations then serve as specifications for operations throughout an organization needs to strive for conformity to specifications that meet and improve upon customer satisfaction. (Blocher; 1999: 166)



Total quality management starts with identifying the firm's customers and their requirements. At some stage, everyone in a process or organization is a customer or supplier to someone else, either inside or outside the organization. The TQM process begins by identifying the requirements and expectations of external customers. These requirements and expectations are the bases for specifying requirements for each in succession of internal customer/supplier, production and external vendor requirements, and selling requirements. A firm can serve its ultimate, external customer better if the firm meets fully all the requirements of each internal customer. (Blocher; 1999:167/168)

### **2.3.2.1 Cost of Quality**

Cost of quality is the cost associated with the prevention, identification, repair, and rectification of poor quality, and with opportunity costs from lost production time and sales as a result of poor quality. Traditionally, quality costs had been limited to the cost of finished units. Other cost of poor quality were included as overheads and not identified as quality costs. (Blocher; 1999: 175)

Firms have discovered that in addition to manufacturing cost quality cost includes cost associated with supporting functions such as product design, purchasing, public relations and customer services. Joseph Juran classified cost of quality into four categories: prevention, appraisal, internal failure, and external failure. A main criterion in Juran's classification of quality cost is the time when quality costs are incurred. (Blocher; 1999: 175)

#### **i. Prevention costs**

Cost of preventing defective work is usually expanded before the product is made or the service is rendered. (Dilworth, 1993:465) They include the cost of preventive maintenance, quality planning and training and the extra cost of acquiring higher quality of raw materials. (Drnsy; 2001: 901)

#### **ii. Appraisal costs**

The cost if appraisal is incurred for auditing service procedure to make sure they confirm to prescribe work practi. (Dilworth; 1993:466)

**iii. Internal failure costs**

An internal failure cost includes collecting or repeating any services activities before a service customer leaves an establishment, (Dilworth, 1993:466). They include costs incurred before the product is dispatched to the customer, such as the costs of scrap, repair, down time and work stoppages caused by the defects, (Colin; 2000:902)

**iv. External failure costs**

External failure costs are associated with the defects found after items are shipped to the customer, (Dilworth, 1993:466). They include cost of handling customer complaints warranty, replacement, repairs of returning product and the cost arising from a damaged company reputation. (Drnsy; 2000: 992)

**2.3.2.2 Total Quality and Productivity**

A common misconception is that improvements in quality decreases productivity. The reasoning behind quality improvement requires additional input efforts, since productivity measures the relationship between output and input resources, an effort that requires additional input resources with no increase in output may believe that materials, labor hours, and other resources spent on rework, repair or other activities to improve quality consume additional resources with no increase in output. (Bloche; 1999:185-186)

Studies have shown, however, that improvements in quality led to increase in productivity. The belief that quality improvement and productivity have an inverse relationship may have grown out of the misperception that all units, once manufactured are good outputs, whatever the quality or required subsequent spending to specify poor quality products. A firms accounting system may not include resources on rework or repair in the manufacturing cost of unit. Rather, repair or units. The term hidden factory sometimes refers to the use of facilities and recourse for repairs, reworks, retests, and other remedial work for poor quality products. They are hidden because these accounts often are included as part of the total manufacturing overhead shared by all. (Bacher; 1999:186)

### **2.3.3. KAIZEN (Continuous Improvement)**

Kaizen costing is similar to target costing in its cost reduction mission, except that it focuses on reducing cost during the manufacturing stage of the total life cycle of a product. Kaizen is the Japanese term for making improvements to a process through large innovation. Kaizen's goals are responsible because when the product is already in the manufacturing process, it is difficult and costly to make large change to reduce costs. Kaizen costing contrasts with target costing, which allows many more opportunities to effect change because it occurs much earlier in the product's life cycle. (Blocher; 1999:13)

Henry ford realized that the right attitude is important for success. This belief is that , continuous improvement (the Japanese word is Kaizen) is a management technique in which managers and workers commit to a program of continuous improvement in quality and other critical success factors. Its origin is attributed to Japanese manufactures, with their tireless pursuit of quality. Continuous improvement is very often associated with benchmarking and total quality management, as firms seek to identify other firms as models to learn how to improve their critical success factors.(Blocher; 1999:13)

Kaizen is the Japanese term for making improvements to a process through small incremental amounts rather than through large innovations. The major differences between target costing and kaizen and costing are that target costing is applied during the design stage whereas kaizen costing is focused on the product, and cost reductions are achieved primarily through product design. In contrast, kaizen costing focuses on the production process and cost reductions are derived primarily through the increased efficiency of the production process. Therefore the potential cost reductions are smaller with kaizen costing because; the products are already in the manufacturing stage of their life cycles and a significant proportion of the costs will have become locked in. (drnsy; 2004:950-951)

The aim of kaizen costing is to reduce the cost of components and products by a pre-specified amount. Monden Hamada (1991) describes the application of kaizen costing in Japanese automobile plant. Each plant is assigned a target cost reduction ratio and this is applied to the previous year's actual costs to determine the target

cost reduction. Kaizen costing relies heavily on employee empowerment. They are closest to the manufacturing process and customers are likely to have greater insights into how costs can be reduced. Thus, a major feature of kaizen costing is that workers are given the responsibility to improve process and reduce costs. Unlike target costing it is not accompanied by a set of technique or procedures that are atomically applied to achieve the cost reductions. (Drnsy; 2004: 951)

### **2.3.3.1 Elements of KAIZEN System**

There are basically four elements applied for Kaizen System. They are, (Paudel, 2005:42-44).

PDCA Cycle and progress: the world PDCA does for P for “plan”

- Theme selection
- Reasons for theme selection
- Analysis of current situation
- KAINZEN goal setting and action plan
- D for “do”
- Execution
- C for “check”
- Confirmation of the results
- A for “act”
- Standardization
- Remaining problems and future plans

PDCA cycle is used to identify the problem and the portion of original goals which has not been received. So Kaizen can be generated to situation. Using PDCA model the Kaizen is generated as follows:

Step 1: Fined a problem and select themes (policy)

Step 2: Find the cause for the problem and consider the reasons why the theme was selected.

Step 3: study what is the most influential factor and analyze the present situation.

Step 4: consider remedial measure using 5W 1 H, principle as follows:

5 Ws Why (concerning with necessity)

What (concerning with objective)

Where (concerning with place)

When (concerning with time and limits)

Who (concerning with person)

1H:

How (concerning with method)

Step 5: implement remedial measure.

- Integration of TQM function and professional Function:  
TQM function and professional function both should be integrated to Kaizen.

Kaizen will be effective only if both functions are cooperating.

- Top down and Bottom-up management:

There should not be restriction for upward messaging if Kaizen system has to be implemented effectively. Two way traffic should be entertained for communication. Similarly, employees need to be motivated to participate in 5s activity, suggestion program (idea box) and quality circle. The 5s activities are as follows:

5s	Original Japanese	English Meaning
1s	Seiri or Clear cut	Sort out unnecessary item in the workplace and discarded them.
2s	Section or configure	Arrange all necessary item in good order so that they can be picked for use: a. A place for everything b. Everything in its place.
3s	Seiso or clean check	Clean your workplace completely so that there is no dust on the floor, machines or equipment
4s	Sei ketsu or conform	Maintain a high standard of housekeeping and a work place organization at all timed.
5s	Sbitsuke or custom and practice	Train people to follow good housekeeping disciplines autonomously.

Three Dimensional Management:

For effective application of KAIZEN the management should be three dimensional.

The three dimensions are:

- a) Policy management
- b) Department management
- c) Inter departmental management

### **2.3.4. Activity Based Costing and Management**

A new method of cost accounting developed in the past 10 years called "activity-based" accounting it records all costs. Within the next 10 years it should be in general use. And then we will have operational control manufacturing. (Druker, 1993:14)

Many firms have found, they can improve planning, product costing, operational control, and management control by using activity analysis to develop detailed description of the specific activities performed in the operation of the firm. The activities analysis provides the basis for activity based costing and activity based management. Activity Based Costing (ABC) is used to improve the accuracy of cost Analysis by improving and tracing of costs to cost objects. ABC is used to cost objects ABC is used for different cost objects including individual products. And related groups of products, and individual customers. Activity Based Management (ABM) uses activity analysis to improve operational control and management control. Although ABC and ABM have been in practice for some time, only in recent year have they become widely used. These techniques are especially useful when operations are complex, with the large number of products and manufacturing process or steps in providing the services to customers. When operations are complex, the identification of cost tracing for activities can provide a good understanding of cost drivers and cost behavior that is difficult to obtain without detailed activity analysis. ABC and ABM are key strategic tools for firms with complex operations. (Blocher, 1999:13-14)

ABC helps firms to reduce distortions caused by the traditional costing system and obtains more accurate product costs. It provides a clear view of how a firm's diverse products, services, and activities contribute in the long run to the bottom line. ABM focuses on managing activities to promote business efficiency and effectiveness, and to increase not only the value received by customers but also the firm's profit. (Blocher, 1999:89)

ABC and ABM are closely tied to strategic cost management. Managers receive more meaningful information to answer strategic questions such as , (Blocher, 1999:89).

- What are potential impacts on pricing and product line decisions if a firm switches from the traditional costing system to an activity based costing system?
- What are potential cost savings if a firm uses ABM to identify and eliminate non value added activities to achieve its low cost strategy?
- How can ABC/ABM help to firm achieve its complete strategy of high performance and short lead time in delivering its product?
- How can ABC/ABM help a firm analyze its major customer's profitability and develop a customer-focused strategy?

### **2.3.5 Reengineering**

Reengineering is a process for creating competitive advantage in which a firm recognizes its operating and management functions, often with the result that jobs are modified, combined, or eliminated. It has been defined as the fundamental rethinking and radical redesigning of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed. Under the pressure of global competition, many firms look a reengineering as a way to reduce the cost of management and operations, and as a basic for careful reanalysis of the firm's strategic competitive advantage, cost management supports the reengineering effort by providing the relevant information, (Blocher; 1999: 140)

Reengineering is the complete redesign of a process. With an emphasis on findings, Create new ways to accomplish an objectives reengineering has sometimes been desired as talking blank piece of paper and starting from scratch to redesign a business process. Rather than searching continually for minute improvements, reengineering in value a radical shift in thinking about new objectives should be met. (Hiliton; 1997: 268)

Reengineering is the fundamental rethinking and radical redesigning of business process to achieve contemporary measure of performance, such as cost, quality, service, and speed, (Hammer; 1993:2)

### **2.3.5.1 Reengineering Process**

Richard B. Chase, Nicholas J. Aquilino and Jacobs F. Robert (1999) have presented the following six steps to be taken into consideration for reengineering any product manufacturing:

#### **Step 1 State a Case for Action**

The need for change should be effectively communicated to company employees through educational and communication campaigns. Two key messages should be articulated:

- i. A need for action: here is a company, and this is why we can't stay here.
- ii. A vision statement: this is what, we, as a company needs to become.
- iii. The objective for reengineering must be in the form of a qualitative and quantitative vision statement. These objectives include goals for cost reduction, time to time market quality and customer satisfaction level and financial indicators.

#### **Step 2 identify the process**

All major processes in organization should be initially identified. However, not all major processes should be reengineered at the same time. The following questions define the criteria for selecting processes of reengineering:

- i. Which processes are currently most problematic?
- ii. Which processes are critical to accomplishing company strategy and have the greatest impact on the company's customer?
- iii. Which processes are most likely to be successfully redesigned?
- iv. What is the project scope and what are the costs involved?

#### **Step 3 Evaluation Enablers**

Information technology and human/organizational issues act as enablers of the reengineering process. Technology evaluation has now become a core competency required of all companies, Companies should develop the ability to evaluate current and emerging technology and identify creative application to redesign their existing process.



#### **Step 4 Understanding the Current Process**

The current process must be studied to understand the activities which are essential to completion. We need to introduce some terminology to describe component activities to add our analysis. All work activities can be classified into three types:

- i. Value-adding work: it consists of all the activities that create the goods and services that customers want. Value adding work can rarely be eliminated from a process, although it can be improved.
- ii. Non value-adding work: it is mainly administrative overhead-the reporting, checking, supervising, controlling, reviewing and coordinating.
- iii. Waste work: it is pointless work whose absence would, by definition, not be noticed by the customers, producing reports that no one read, doing erroneously, so that it needs to be done and redundant checking activities are needed to be eliminated.

#### **Step 5 Create a New Process Design**

Process design requires beginning with a clean sheet of paper. Reengineers should suspend current rules, procedures, and values so as to create new process designs. They also need to utilize the principles of reengineering that have been discerned. The first emphasis in reengineering process is to eliminate all waste work. Waste work can often be eliminated immediately during the reengineering effort. Next, focus is on elimination of non value-adding work. The consequences of redesigning process, to reduce non-value adding work, are significant.

#### **Step 6 Implement the Reengineered Process**

Leadership is critical, not just to the implementation process but to the entire reengineering effort. Process engineering teams are typically responsible for implementing the new designs. However, support and buy in from line managers are crucial to success because implementation changes accountability of line managers while expecting them to deliver on the improvements.

##### **2.3.6 Theory of Constrains (TOC)**

In contrast to target costing, which focuses on the early phases of the cost life cycle, the theory of constraints focuses on manufacturing activity. The theory of constraints (TOC) was developed by Goldratt and Cox to help managers to improve the overall profitability of the firm. This theory focuses the manager's attention on

the constraints, or bottlenecks, that slow the production process. The main idea is that a firm succeeds by maximizing the overall rate of manufacturing output, which is called the throughput of the firm. Throughput is defined as sales less direct costs, including purchased components and material handling cost. (Blocher, 1999:140)

TOC directs managers' attention to the speed with which the product's raw materials and purchased components are passed into final products and delivered to the customer. TOC emphasizes the improvement of throughput by removing or reducing the bottlenecks in the production process that slow the rate of output, manufacturing and distribution process that do not affect throughput are nonbinding constraints that receive less attention than bottlenecks or binding constraints. (Blocher, 1999:140)

### **2.3.6.1 Steps in Theory of Constraints Analysis**

Blocher (1999) has indicated five steps in TOC analysis

#### **Step 1 Identify the binding constraints**

In the first step the management accountant works with manufacturing managers and engineers to identify binding constraints by developing a network diagram of the flow of production. A network diagram is a flow-chart of work done that shows the sequence of processes and the amount of time required for each. The purpose of the network diagram is to help the management bottleneck. A bottleneck is often indicated by a process with relatively large amount of inventory accumulation or where there are lead times. Task analysis, which describes the each process in detail, also can be used to identify binding constraints.

#### **Step 2 Determine the most efficient utilization for each binding constraint**

In this step, the management accountant determines how to utilize the firm's resources most efficiently. The approach differs somewhat depending on whether there is one product, or two or more. If there is one product, the management accountant looks for ways to maximize the flow of production through the constraint. For two or more products, however, the determination of which product or product mix to product becomes important, as does maximizing the glow through the constraint. Different products are likely to require different times on the binding constraint. Thus, managers must determine the most profitable mix of the products. Determining the most profitable product mix involves careful analysis of the

profitability of each product as well as the time required for each product on the binding constraint.

### **Step-3 Manage the flows through binding constraint**

In step 3 the objective is to manage the flow of production in and out of the binding constraint to smooth the flow of production throughout the plant. The orderly scheduling of production prevents the building up of materials or work-in-process inventory at various processes. An important tool for managing product flow in this context is the Drum-Buffer-Rope (DBR) system which is a system for balancing the flow of production through a binding constraint.

### **Step 4 Add capacities to the binding constraint**

As a longer-term measure to relieve the bottleneck and improve throughput, management should consider adding capacity to binding constraints, by adding new or improved machines/and/or additional labor.

### **Step 5 Redesign the manufacturing process for flexibility and fast throughput**

The most complete strategic response to the bottleneck situation is to redesign the manufacturing process, including the introduction of new manufacturing technology, deletion of some hard to manufacture products, and redesign of some products for greater ease of manufacture simply removing one or more minor features on a given product might speed up the production process significantly. The use of value engineering as described earlier might help at this point.

#### **2.3.6.2 ABC and Theory of Constraints**

Activity based costing (ABC) is employed commonly by firms using such cost management methods as target costing and the theory of constraints. The difference is that TOC take a short term approach to profitability analysis, whereas ABC costing develops a long term analysis. The TOC analysis has a short term focus because of its emphasis only on materials related costs, which ABC includes all products costs, (Blocher; 1999: 145)

On the other hand, unlike TOC, ABC does not explicitly include the resource constraints and capacities of production activities. Thus, ABC cannot be used to determine the short term best product mix, as for the auto window manufacturer. ABC and TOC are thus complementary methods; ABC provides a comprehensive analysis of cost drivers and accurate unit costs, as a basic for strategic decision about a long term pricing and product mix. In contrast, TOC provides a useful method for improving the short term profitability of the manufacturing plant through short term product mix adjustments and through attention to production bottleneck. (Blocher; 1999:145)

### **2.3.7 Just in Time (JIT)**

Think of a situation where we produce the required goods only at the time when they are needed and in the quality that is needed; and where this holds goods for finished products and semi finished products, both. If such a situation materializes, the inventories of the finished goods and work in progress would be almost nil or low, if we make our raw materials supplier agree that they should deliver their goods only at the time and in the quantities we need them to, then we are almost eliminating raw materials inventories as well. We shall then have virtually zero inventories (or near about zero). This is called the just in time (Z-I-T) production system founded by Taiichi Ohno (a vice president at Toyota) and first successfully implemented at the Toyota motor company's plants in Japan and now being tried at various manufacturing industries all over the world. (Bhattacharya; 2004:36.1)

The competitiveness of Japanese manufactured products has focused attention on their manufacturing systems since the basis of their success has been high quality, competitively priced products. Indeed, the Japanese market strategy seems to be rooted in their production systems and the literature is filled with reports of remarkable quality levels, achieved along with lower costs through higher productivity and very low in process inventories. (Buffa; 1987:436)

JIT manufacturing requires making a product or service only when the customer, internal or external, requires it. It usages a product layout with a continuous flow-one with no delays once production starts. This means a substantial reduction in

setup costs is necessary to eliminate the need to produce in batches; therefore, processing systems must be reliable. (Anthony; 2004: 203)

### **2.3.7.1 Single Unit Production and Conveyance**

The JIT concept may have been borrowed from the inventory systems of American supermarkets, i.e. only the units that are sold are replaced. It is actually a production and materials planning system where the production and procurement closely follow the actual demand. And this system is carried down the line from final product to the basic component. It can be perceived as a job order production carried to the extreme of single unit job ordering yet retaining the conveyer or line system and its advantages. There are no lot size productions anywhere (If inevitable, they are minimized). As and when the item is produced it is conveyed to the next process so that there is no “waiting” involved at any place. Of course, the operation time at each work place are also equalized. In short, JIT we have: (i) no delay either due to lot size production or due to unequal production time of different work places and (ii) conveyance times are also balanced JIT is a combination of single unit production and the conveyance system and is called ‘IKKO Nagare’ in Japanese meaning single unit production and conveyance. (Chary; 2004:36.1)

### **2.3.7.2 Eliminating Waste and Adding Unable**

Just in time requires a great deal of organizational discipline. As in the case of material requirements planning (MRP), JIT requires not only changes in the way a company handles its inventory but also changes in its culture. JIT also encompasses the Japanese managerial characteristics. (Adam 2005:567-568)

The seven wastes-shigeo shingo, as recognized JIT authority and engineer at the Toyota motor company identifies seven wastes as being the targets of continuous improvement in production processes. By attending to these wastes, improvement is achieved. (Adam, 2005:568)

- Waste of overproduction- Eliminate by reducing setup time, synchronizing quantities and timing between processes, compacting layout visibility, and so forth make only what is needed.

- Waste of waiting- Eliminate through synchronizing work flow as much as possible, and balance uneven loads by flexible workers and equipment.
- Waste of transportation- Establish lay outs and locations to make transport and holding unnecessary if possible. Then rationalized transport and material handling that cannot be eliminated.
- Waste of processing it- First question why this part or product should be made at all, they why each process is necessary. Extend thinking beyond economy of scale or speed.
- Waste of stocks- Reduce by shorting setup times and reducing lead times, by synchronizing work flows and improving work skills, and even by smoothing fluctuations in demand for the product. Reducing all the other wastes reduces the waste of stocks.
- Waste of Motion- Study motion for economy and consistency. Economy improves productivity. First improve the motions, then mechanize or automate. Otherwise there is danger of automating waste.
- Waste of making defective products- Develop the production process to prevent defects from being made so as to eliminate inspection. At each process accept no defects and make defects. Make processes failsafe to do this. From a quality process comes quality product automatically.

### **2.3.7.3 Value Added Manufacturing**

JIT's seven wastes are at the root of what U.S. companies term value added manufacturing: any step in the manufacturing process that does not add value to the product for the customer is wasteful. Examples of wasteful steps included process delays, (WIP) process inventories, finished goods inventories, excessive paper processing, and many other activities that do not add value to the product. Wasteful tasks increase costs and reduce competitiveness. To identify and delete wastes, each aspect of manufacturing is analyzed to confirm or refute its value. (Adam, 2005:568)

### **2.3.7.4 KANBAN Production Information System**

A JIT production system uses a particular material withdrawal and work ordering system. This is called the Kanban (or maker) system. As we have so far noted, the JIT system works, based on the requirement at the final product level. Basically it

believes in producing at a time only that many items as have been withdrawn. This chain of withdrawal-and-production is continuous from the end product to the beginning process. This is the way the work in process inventory is kept very low. (In the JIT system, in fact, the inventories are not kept in the store but on the shop floor, right in between the proceeding and succeeding processes.) The withdrawal of material forms the proceeding process and the production of items to replace this is ordered through a withdrawal and production Kanban (or maker card). It is physical control system, and is visual in nature which is an advantage over the conventional production control paper work could be quite confusing at times. (Chary; 2004:36.4)

#### **2.3.7.5 JIT as a Business Philosophy**

JIT should not be viewed as a mere production system. It expresses, in fact, an organization's philosophy of customer orientation. Service to the customer is the focus of JIT. The production system is a consequence of this business philosophy. Service includes providing to customer the product (necessary service) in time, providing him variety of products, allowing him to choose as per his performances, providing him with quality products, providing him service/product close to him (space utility), and communicating with him more intensely than before almost including him in your own facility or vice versa and above all providing product/service at a price affordable and perceived as reasonable by the customer. Such service-orientation generates the need for an appropriately responsive production system such as a JIT system, (Chary; 2004: 36.8).

As the customers are to be provided a variety of products and in time, the production of the finished goods should be in very small lots. For the same reason, the upstream production processes should also produce equally small lots just to meet the downstream needs. Going upstream in this manner, it is obvious that the vendors too have to supply items in small numbers and just in time, (Chary, 2004:36.8).

#### **2.3.7.6 Implication of Just in Time Manufacturing**

Just in time manufacturing is a simple theory but hard to achieve in practice. Some organizations hesitate to implement JIT because with no work in process inventory a

problem anywhere in the system can stop all production. For this reason, organizations that use just in time manufacturing must eliminate all sources of failure in the system. The production process must be redesigned so that it is not prohibitively expensive to process one or small number of items at a time. This usually means reducing the distance over which very adaptable people and equipment that can handle all types of job. (Anthony; 2001:204)

As the core of the JIT process is a highly trained workforce whose task is to carry out activities using the highest standards of quality. When the employee discovers a problem with a component he or she has received, it is the responsibility of that employee to call immediate attention to the problem so that it can be corrected. Suppliers must be able to produce and deliver defect free materials and components just when they are required. In many instances, companies compete with the suppliers of the same components to see who can deliver the best quality. At the end of a performance period, the supplier who performs the best will obtain a long term contract. Preventative maintenance is also employed so that equipment failure is a rare event, Consider how just in time manufacturing can be used at a food restaurant. Some use a just in time, continuous flow product layout, while others use batch production in a production layout process. In fact, some fast food restaurants combine both approaches into hybrid systems that use a batch approach to production and keep inventories at predefined levels. For example, the restaurant may use racks or bins to hold food ready to be sold to the customer and have employees start another batch of production when the existing inventory falls below a line drawn on the bin or rack. At off-peak times the restaurant may produce to order. The motivation to use the JIT approach is to improve the quality of the food and to reduce waste by eliminating the need to discard food that has been held in the bin too long. The motivation to use batch production is to sustain a certain level of inventory to reduce the time the customer has to wait for an order. As processing time and set up costs drop, the organization can move closer to just in time manufacturing and reduce the wastes and quality problems that arise with batch production. (Anthony; 2004:206)



### **2.3.8 Target Costing**

Target costing is a customer oriented technique that is widely used by Japanese companies and which has recently been adopted by companies in Europe and the USA. The major advantage of adopting target costing is that it is deployed during a product's design and planning stage so that it can have a maximum impact in determining the level of the locked-in costs. (Drnsy; 2004:946)

Target costing is the design of a product, and the processes used to produce it, so that ultimately the product can be manufactured at a cost that will enable a firm to make a profit when a product is sold at an estimated market driven price. Target costing can be critical tool for management as it seeks to strategically manage the company's cost and profits. By ensuring that products are designed so that they can be produced at a low enough cost to be priced competitively, management can achieve or maintain a sustainable competitive position in the market. (Hilton; 2002:670)

Target costing is a tool that has arisen directly from the intensely competitive markets in many industries. Target costing determines the desired cost for a product on the Babes for given competitive price, such that the product will earn a desired profit. Cost is thus determined by price. The firm using target costing must often adopt strict cost reduction measures or redesign the product or manufacturing process by order to meet the market price and remain profitable. (Blocher; 1999:16)

Target costing is a method of profit planning and cost management that focuses on products with discrete manufacturing processes. The goal of target is to design costs of products in the RD and stage of a product is life cycle, rather than trying to reduce costs during the manufacturing stage. Target costing is a relevant example of how a well designed MACS can be use for strategic purpose and how critical it is for organization to have chain. (Atkianson & Kalpaln; 2004:290)

A major feature of target costing is that a term approach is adopted to achieve the target cost. The team members included designers, engineers, purchasing, manufacturing, marketing, and management accounting personnel. Their aim is to achieve the target cost specified for the product at the prescribed level of

functionality and quality. The discipline of a team approach ensures that no particular group is able to impose their functional preferences,(Drnsy, 2004:946)

According to Drnsy, (2004) target costing can be used as a cost management tool, which involves the following stages:-

- Stage 1** -determine the target price which customers will be prepared to pay for the product.
- Stage 2** -Deduct a target profit margin from the target price to determine the target cost.
- Stage 3** -estimate the actual cost of product.
- Stages 4** -If estimated actual cost exceeds the target costs investigate ways of driving down the actual cost to target cost.

#### **2.3.8.1 Target costing and Value Engineering**

Target costing is an outgrowth of concept of value engineering, which is a cost reduction and process involvement technique that utilization information collect about produce is design and production processes and then examines various attributes of then design and processes to identify candidates for improvement efforts. (Hillton; 2002: 673-674)

Much of the historical development of the target costing approach has here now “more than 80 percent of all assembly industries in Japanese companies”. In recent years, however, many other companies have made significant contributions to target costing theory and practice. Among them are Caterpillars, Daimler Chrysler, Boeing, and Kodak. (Hilton; 2002:674)

#### **2.3.8.2 Target Costing and Kaizen Costing**

Target costing is to use Kaizen costing and operational control to further reduce costs. Kaizen costing occurs at the manufacturing stage, so that effects of value engineering and improved design are already in place, the role for cost reduction at this phase is to develop new manufacturing methods and to use new management techniques such as operational control, total quality management and theory of constraints to further reduce costs. Kaizen means “continual improvement”, that is,

the forgoing search for new ways to reduce costs in the manufacturing process of product with a given design and functionality.(Blocher; 1999:138)

### **2.3.9 Life Cycle Costing**

Life cycle costing is a management technique used to identify and monitor the costs of a product throughout its life cycle. The life cycle consists of all the steps from product design and purchase of raw materials to delivery and service of the finished product. The steps include (i) research and development, (ii) product design including prototyping target costing and testing, (iii) manufacturing, inspection, packaging and warehousing, (iv) marketing, promotion and distribution and (v) sales and service. Cost management has traditionally focused only on costs incurred at the third step, manufacturing. Thinking strategically, management accountants now manage the full life cycle of costs for the product, including upstream costs as well as manufacturing costs. This expanded focus means that careful attention is paid especially to product design, since design decisions lock in most subsequent life cycle costs. (Blocher; 1999:16)

Life cycle costing estimates and accumulates costs over a products entire life cycle in order to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre-add post manufacturing stages. Identifying the costs incurred during the different stage of product's life cycle provides an insight into understanding and managing the total costs incurred throughout its life cycle. Life cycle costing help management to understand the cost consequences of developing and making a product and two of identify areas in which cost reduction efforts are likely to be most effective. (Drnsy; 2000:844)

Products today are said to be profitable only when it yields profits over their whole life cycle periods. To know the life cycle profits the costs to be incurred during various periods over the life cycle of the products should be known. Mainly these costs are of two-types by nature cost committed and costs incurred. Cost management is also called licked in costs. These cost those costs, which have not been incurred but will be incurred in the future on the basis of decision that has already been taken. The product design specifications in the planning phase

determine a product's material and labour inputs and production process. At this stage, cost become committed and broadly determines the future costs that will be incurred during the manufacturing stage. Incurred costs are those costs, which are already been expended. These occur when a resource is used or scarified. In the manufacturing stage, the majority of costs are incurred. Costs are incurred only after they are committed. Committed costs cannot be altered. So, before making any cost committed, proper decision should be taken prior in planning phase. Understanding of life cycle costs helps to take right decision in the very beginning. (Dahal; 2005:58)

A typical product's life cycle has five distinct stages. Obviously, not all products will flow this pattern. Some products will fail early and have a truncated life cycle. (Atkianson & Kaplan, 2004:60)

- 1. The product development and planning phase-** In this phase, the organization incurs significant research and development costs and product testing costs. Traditional costing often treats these costs as general overhead with two consequences: they are not associated with the product that creates the cost, and the total amount of these costs is often either unknown or only vaguely known.
- 2. Introduction phase-** In this phase, the organization incurs significant promotional costs are new product is introduced to the market place. At this stage, the product's revenue will often not cover the flexible and capacity-related costs that it has inflicted on the organization.
- 3. Growth phase-** during this phase, the product's revenues finally begin to cover the flexible and capacity-related costs incurred to produce, market, and distribute the product. There is often little or no price competition. The focus of attention is on developing systems or delivers the product to the customer in the most effective way.
- 4. Product maturity phase-** In this phase, price competition becomes intense and product margins (the difference between the product's revenue and

flexible costs) begin to decline. While the product is still profitable, profitability is declining relative to the growth phase; organizations undertake intense efforts to reduce costs of remain competitive and profitable.

**5. Product decline and abandonment phase-** During this phase, the product begins to become unprofitable. Competition begins to drop out-the least efficient first. The remaining competitors find themselves competition for a share or a smaller and declining market. As organizations abandon the product, they incur abandonment costs such as selling off equipment no longer required or restoring an asset prior to abandoning it (e.g.) land reclamation in the case of a mine that has been worked out and is being abandoned.

Form this life cycle; it is apparent that product-related costs occur unevenly over the product's life time. This uneven pattern has prompted some people to argue particularly costs other than those associated with making the product and delivering it to the customer, should be considered systematically both before and during the product's lifetime, ((Atkianson & Kaplan; 2004:61)

#### **2.3.9.1 Purpose of life cycle costing**

There are three broad purpose of life cycle costing. First life cycle costing helps to develop a sense of the total costs associated with a product in order to identify whether the profit earned during the active manufacturing phase will cover the costs in the development and decommission phase. Life cycle costing often will identify product that are no longer profitable when their decommissioning costs are factored into the product evaluation process. Second, because of its comprehensive consideration of costs, lifecycle costing will identify a product's environmental cost Consequences and spur action to reduce or eliminate those costs. Third, life cycle costing helps to identify the planning and decommissioning cost in that phase. In general, life cycle costing provides a comprehensive accounting for a product costs. Both manufacturing and environmental, from cradle to grave to help decision makers understand the cost consequences making that product and to identify areas in which cost reduction, efforts are both desirable and effective, (Atkianson &Kaplan; 1998:236)

### **2.3.10 The Balanced Scorecard**

With the emergence of the information era, however, companies needed more than prudent investment in physical assets and excellent management of financial assets and liabilities assets as well as their physical and financial assets. An organization's intangible assets include the following, (Atkianson & Kaplan; 2004:355)

- Loyal and profitable customer relationships
- High-quality processes
- Innovative products and services.
- Employee skill and motivation

Given the importance of intangible assets, some academic scholars and practioners have tried to expand the financial model to incorporate the valuation of intangible assets and a company's balance sheet. Realistically, however, difficulties in placing a reliable financial value on intangible assets will likely prevent them from ever being recognized on a company's balance sheet. Yet these assets are critical for success, and managers understand that "If you can't measure it, you can't manage it". Many managers searched for a system that would help them measure and manage the performance of their intangible, knowledge-based, assets. (Atkianson & Kaplan; 2004:355)

Strategic information using critical success factors provides a roadmap for the firm to use to chart its competitive course, and serves as a benchmark for competitive success. Financial measures such as profitability reflect only a partial and frequently only short term, measure of the firm's progress without strategic information, the firm is likely to stray from its competitive course, to make strategically wrong product designs-for example, choosing the wrong marketing and distribution methods. (Blocher;1999: 1617)

The Balance scorecard (BSC) provides a system for measuring and managing all aspects of a company's performance. The scorecard balance traditional financial measures of success- such as profits and return on capital-with non financial measures of the drivers of future financial performance. The balance scorecard measures organizational performance across four different but linked perspectives

that are derived from the organizational vision, strategy and objective. (Atkianson & Kaplan; 2004:356)

- Financial: How is success measured by our shareholders?  
Customer: How do we create value for our customers?
- Internal: At what, internal processes we excel to satisfy our customers and shareholders?
- Learning and growth: what employee capabilities, information systems, and organizational climate do we need to continually improve our internal processes and customer relationships?

To emphasize the importance of using strategic information, both financial and non financial, accounting reports of a firm's performance are how often based on critical success factors in four different dimensions. One dimension is financial, the other three dimensions are non financial. (Blocher; 1999: 17)

**a) Financial Perspective**

The balanced scorecard retains the financial perspective as the ultimate objective for profit-maximizing companies. Financial performance measures indicate whether the company's strategy, implementation, and execution are contributing to bottom-line improvement. Financial objectives typically relate to profitability-measured, for example, by operating income and return-on-investment the company's financial performance can be improve through two basic approaches-revenue growth and productivity. Profitable revenue growth can be achieved by depending relationships with existing customers, such as selling them additional products and services beyond the first product or service they purchase. For examples, banks can attempt to get their checking account customers to also use the bank for mortgages and car loans. (Atkianson & Kaplan; 2004: 360)

**ii) Customers Perspective**

In the customer perspective of the balanced scorecard, managers identify the targeted customer segments in which the business unit competes and the measures of the business unit's performance in these targeted segments. The customer perspective typically includes several common measures of the successful outcomes from a well-formulated and implemented strategy. (Atkianson & Kaplan; 2004: 362)

- Customer satisfaction
- Customer retention
- Customer acquisition
- Customer profitability
- Market share
- Account share

### **iii) Internal Perspective**

Once an organization has a clear picture of its financial objectives and customer objectives, it can determine the means by which it will.

- Produce and deliver the value proposition for customer and
- Achieve the productivity improvements for the financial objectives.

The internal perspective of a balanced scorecard indentures the critical progresses in which the organization must excel to achieve its customer, revenue growth, and profitability objectives. (Atkianson & Kaplan; 2004: 365)

Organizations perform many different processes. It is useful to think of processes within four groupings. (Atkianson & Kaplan; 2004:365)

1. Operating processes
2. Customer management process
3. Innovation process
4. Regulatory and social process.

### **iv) Learning and Growth Perspective**

The fourth perspective of the balanced scorecard, learning and growth, identifies the objectives for the people, systems, and organizational alignment that create-long term growth and improvement. For the learning and growth perspective, managers define the employee capabilities and skills, technology, and organizational alignment that will contribute to improve performance in the measures selected in the first three perspectives. They learn where they must invest to improve the skills of their employees, enhance information technology and system, and align people to the company's objectives. (Atkianson & Kaplan; 2004:373)



The learning and growth perspective of the scorecard identifies how executives mobilize their intangible assets-human, information, and organizational-to drive improvement in the internal processes most important for implementing their strategy. The following describes some typical objectives for these three components of the learning and growth, perspective, (Atkianson & Kaplan; 2004:374)

- Employee capabilities
- Information capabilities
- Organization alignment

## **2.4 Review of Previous Research works**

**Dahal (2005)** has made study about “Cost Reduction Tools: A Study on applying to strength manufacturing enterprises of Nepal.” And his study has shown the following findings and recommendations:

Objective

### **His Main Objective:**

A detail investigation of causal linkage of cost reduction system and organizational performance can be conducted

- To know the view regarding application of cost reduction tools in organizations.
- To identify the problem for using such tools.

### **His Major Findings:**

- The main reason behind less use to JIT in Nepalese business environment is lack of information about JIT and non-availability of suppliers.
- There is the lack of skilled manpower and internal failure cost in applying TQM.
- The more useable cost reduction tool in business enterprises is training.
- The main cause of not applying benchmarking is lack of proper direction and co-ordination.

### **His Major Recommendations:**

- Japanese cost management tools should be widely used. And firms have to think how to make the practice effective.

- Specially, the electric firm, textile companies and engineering firms should give effort for JIT application.
- Firms should keep on benchmarking other's practices and bring corresponding practice to their own ground.
- Firms should manage the activities with cost.

**Paudel, (2007)** has made study about "Cost Reduction Tools: A study on applying to strength manufacturing enterprises of Nepal." And his study has shown the following findings and recommendations.

**His Main Objective:**

- To know the view regarding application of cost reduction tools in organizations
- What is the manager's attitude to use such tools?
- To study on how they are using such tools.

**His Major Findings**

- The research works have found that about 50.59% of the firms are practicing cost management/reduction.
- This shows that manufacturing sector in Nepal is not widely practicing cost reduction. Research made among the firms has shown that existing cost reduction practice is different between the sectors.
- The average figure shows that 61.67% of the samples from chemical sub-sector were practicing cost reduction, which is the highest among
- Similarly, cost reduction tools were found not equally applied in Nepalese manufacturing sector.

**His Major Recommendations**

The cost reduction should be accompanied by mass production and wide distribution as well. Based on the findings/conclusions of this research works following recommendation have been forwarded for Nepalese manufacturing sector for effective cost reduction purpose.

- Firms should keep on benchmarking others' effective practices and bring corresponding practice to their own ground.

- Automated technologies have to be widely used. Firms should shift to automated and group technologies from the age-old manual and obsolete mechanized technologies.
- Management auditors have to conduct audits on varied areas and give improvement suggestions.
- Engineering firms should give a break through practice to target costing FBT and chemical firms are suggested to give high efforts to target costing team than the top management.

**Karki (2008)** has made study about “Practice of cost reduction tools and techniques in selected Nepalese manufacturing companies.” And his study has shown the following findings and recommendations.

**His Main Objective:**

- How the management is recommended to apply the supervision system in order to implement the currently used tools and techniques properly
- To study on applying to strength manufacturing enterprises of Nepal.

**His Major Findings:**

After discussion of the different aspects of cost reduction tools and techniques major findings can be listed out as following.

- The major course of suffering the loss by Nepalese manufacturing companies is due to lack of proper supervision and management.
- The companies are trying to achieve objective by means of increasing selling price. They are trying to reduce the purchasing cost by means of managing cost in proper way.
- Majority of the companies are not applying the JIT system currently. Major problem of the failure of the system is due to lack of skilled and experienced manpower. In order to make success of the system properly, Nepalese manufacturing companies should establish the long term stable relationship with the employees.
- Majority of the sampled companies are adopting the ABM costing system at present and adapting activity reduction as the tool of cost reduction under the system.

### **His Major Recommendations:**

Analyzing the different aspect of cost reduction tools and techniques in selected Nepalese manufacturing companies real status relating to it has been observed. Based on the status as the application of some cost reduction tools, some points are recommended here, these will be helpful to reduce the cost within the organization.

- Out of total tools and techniques under studied only 54.55% of them have been employed in majoring of the manufacturing companies. In order to manage and reduce the total cost in proper way, the managements are recommended to apply other famous tools and techniques as soon as possible.
- The management are recommended to apply the supervision system in order to implement the currently used tools and techniques properly. Similarly, they are suggested to establish an information system to use the new tools and techniques in order to reduce cost to the minimum level.
- Involvement of top management is higher in order to implement the target costing system in Nepalese manufacturing companies. Single effort may not sufficient to achieve the goal of cost reduction. Therefore, the top management of the companies are recommended to make participation of the subordinates staffing in the planning and implementation process.

## **2.5 Research Gap**

Above review implied that most of Nepalese manufacturing organizations are not very serious regarding the application of cost reduction tools. That's why they have not been successful in meeting their target. The other side, it is observed that the pervious researchers did not focused on impact of cost reduction tools on overall performance. And pervious researchers are failed to recommend to the government of Nepal, because the business mostly based on government rules and regulation. It is not considered the political instability, strike and other various abnormal cases

which are shown in time to time, though the researchers only consider the scientific cost reduction tools. The practical difficulties are ignored by them. Cost will vary as per the life cycle stage of the products. However, majority of the idealess the life cycle costing system presently. They have failed to adopt life cycle costing system because of the difficulties in determining the life time cost. Therefore, the companies are recommended to estimate the product cost as per the life cycle. Majority of the companies are using cost effectiveness analysis as the measurement of training effectiveness. It would be more effective if they conduct refresher training as per the need.

So, this study will be fruitful to those interested persons, scholars, professors, students and business academically as well as from policy perspective.

## **CHAPTER – III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The prime objective of the present study is to identify the condition of application of cost reduction tools in Nepalese manufacturing organization. It will draw out how many organizations are applying such tools. Why others are not applying such tools? The research methodology adapted for the present study has been outlined in this chapter which deals with research design, sources of data, population and sampling, data collection procedures, data analysis procedure.

#### **3.2 Research Design**

Keeping in mind the objective of the study, descriptive cum analytical research design has been followed. It is descriptive in the sense that it clarifies different aspects of cost reduction. It tries to search the qualitative and quantitative aspects of cost reduction especially in Nepalese manufacturing organizations. It is analytical in the sense that it uses different analytical tools to show the respondents view towards the use of some famous tools and techniques in Nepalese manufacturing organizations.

#### **3.3 Sources of Data**

The main source of data for this study is primary. The information has been collected through unit visits. It, therefore, means that primary data have been collected. Questionnaire with multiple-choice answer was prepared before the visit, and distributed during the visit to the unit under study.

#### **3.4 Population and Sampling**

All the manufacturing organization established and operating in with their head office at Kathmandu valley and where the manufacturing organizations of Kathmandu, Lalitpur and Bhaktapur have been taken as population of this study. The sample has been taken by using stratified, convenient, random and judgmental

(Purposive) sampling procedure. From the CG Group and plastics and foam Balaju Industrial area

- Food and Beverage : Balaju at Kathmandu
- Irons and steels : Patan Industrial area, Lalitpur
- Plastics and foam : Balaju Industrial area
- Liquors : Kathmandu Industrial area
- Shoes : Bhaktapur

All those manufacturing organizations having Kathmandu-based head offices contact offices have been taken as target population. Out of target population at least 5 organizations have been sampled selecting was two samples from each strata. The Manufacturing Companies are shoes palace in New Road, Plastic and foam Balaju Industrail area and Patan manufacturing area. And Irons and steels are Manafacturined by Pancha kanya group Company in Kathmandu Valley. As well as Plastics recycling and manufacturing Pvt.Ltd at Bhaktapur Kamalbinayak, Comfort foot wear manufacturing industries at Bhaktapur, Byasi and Smart Foot wear Ghantaghar, Bhaktapur

### **3.5 Data Collection Procedure**

For the collection of the necessary data, questionnaires and schedules were distributed to the respondents of the sample firms. Answers, received thereon, have been changed into numerical data. Respondents are offered for multiple answers to the questions.

### **3.6 Data Analysis Procedure**

The collection information has been tabulated in a frequency distribution for the purpose of data presentation, analysis and extract of findings. As the respondents are given opportunities for giving more than just one answers to the questions, the column of tools reflects sampled organizations from each sub-sectors and the row total shows the total number of organizations choosing a particulars answer. For the analysis of data, percentage analysis method has been adopted.

### **3.7 Testing of Hypothesis**

The hypothesis taken in the research is that the cost reduction practices among the sub-sectors and among the tools of reduction is identical. For this purpose, F-test (Two ways ANOVA) test has been conducted choosing a particular answer

### **3.8 Research Variables**

This search has been conducted using the following research variables.

- i. Benchmarking
- ii. Total quality Management
- iii. KAIZEN
- iv. ABM
- v. Target Costing
- vi. Reengineering
- vii. Life Cycle Costing
- viii. JIT System
- ix. Balance Scorecard
- x. Theory of Constraints



## CHAPTER – IV

### DATA PRESENTATION AND ANALYSIS

#### 4.1 Cost Reduction Practice in Nepal

##### 4.1.1 Profit and Wealth Maximization Practice

A survey was conducted over fifteen manufacturing organizations in Kathmandu valley to explore about how they are trying to maximize profit cum wealth objective. The following results have been found.

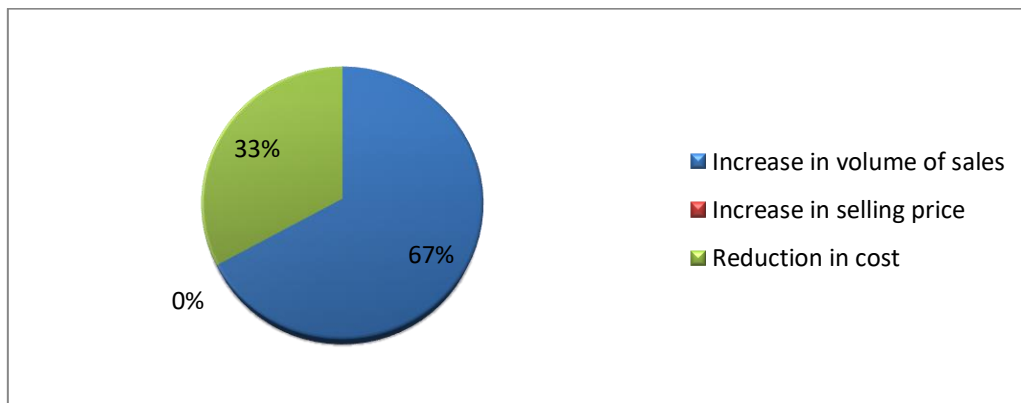
**Table: 4.1**  
**Profit cum Wealth maximization practice sub sector wise observation**

Particulars	Food & Beverage	Irons & Steel	Plastics & foam	Liquors	Shoes	Total	
						No.	%
Increase in volume of sales	2	2	2	2	2	10	67
Increase in selling price	-	-	-	-	-	-	0
Reduction in cost	-	1	3	2	-	5	33
<b>Total</b>	2	3	5	3	2	15	100

Source- Field Survey, 2010

The above data can be presented with the help of following Pie-Chart:

**Figure: 4.1**  
**Profit cum Wealth maximization practice sub sector wise observation**



Out of fifteen manufacturing organizations sampled, ten (i.e. 67%) have been found going for increasing the volume of sales. And 5 (i.e. 33%) have been found emphasizing reduction in their costs for maximizing profit cum wealth. And it is found that no organizations are for increase in their selling price.

Based on the above, it can be analyzed that most of Nepalese manufacturing organizations want to maximize their sales volume. They think that there is no problem in case of sales because demand exceeds the supply. So, it is good to maximize sales volume. Similarly, 33% organizations want to reduce in cost to maximize their profits cum wealth.

#### 4.1.2 Managing Lower Price of Products

Study over those fifteen manufacturing organizations reveal the following results regarding the current practice of these organizations for setting lower price of their product.

**Table:4.2**

**Measures applied for lowering price of products: sub-sector wise observation**

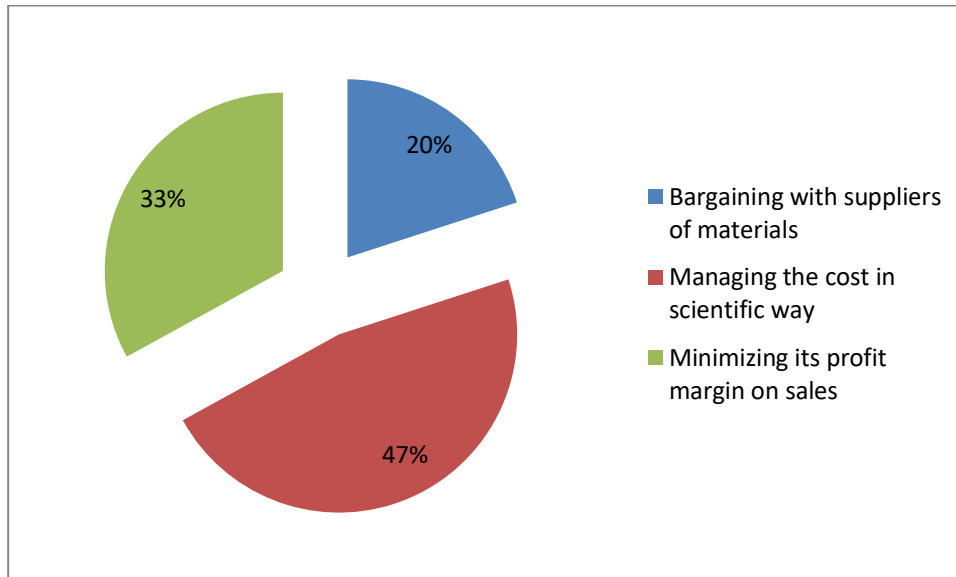
Particulars	Food & Beverage	Irons & Steels	Plastics & foam	Liquor s	Shoes	Total	
						No.	%
Bargaining with suppliers of materials	1	1		1	-	3	20
Managing the cost in scientific way	1	1	3	2	-	7	47
Minimizing its profit margin on sales	-	1	2		2	5	33
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 20010

The above data can be presented through following Pie-Chart:

**Figure:4.2**

**Measures applied for lowering price of products: sub-sector wise observation**



The above table & figure shows that 47% manufacturing organizations sampled are favoring scientific cost management techniques. About 20% organizations are also found bargaining with their material suppliers for managing low cost material. Similarly, 33% organizations are also have found going for minimizing the profit margin on sales.

Based on the above, it can be analyzed that the bargaining with suppliers for material plays less important role to reduce cost. Most of the sampled organizations import their raw materials from foreign country. So it is harmful for them to bargain for material price.

### **4.1.3 Areas Selected for Cost Reduction**

There are many areas which are required to apply the cost reduction program. A survey was conducted to gather information about areas on which organizations are suffering from cost related problems and applying cost reduction programs. The study revealed the following results.

**Table: 4.3**

**Areas selected for Cost Reduction**

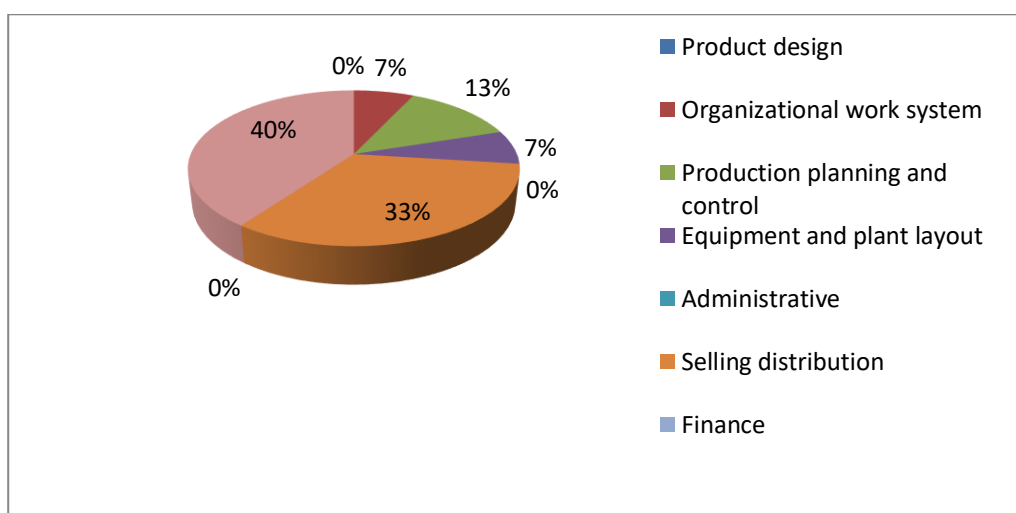
Particulars	Food & Beverage	Irons & Steels	Plastics & foam	Liquor s	Shoes	Total	
						No.	%
Product design	-		-			-	
Organizational work system	-		1			1	7
Production planning and control	-	1	1			2	13
Equipment and plant layout	1		-			1	7
Office and Adm.			-			-	
Selling & distribution	-	2	1	2		5	33
Finance	-		-			-	
Purchase of materials and control	1		2	1	2	6	40
<b>Total</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>15</b>	<b>100</b>

Source: Field Survey, 2010

The above data can be presented by following Pie-Chart:

**Figure: 4.3**

**Areas selected for Cost Reduction**



The above result shows that most of manufacturing organizations have been suffering from purchase of materials and control of cost i.e. 40% organizations consider it as the selected area for cost reduction program. Similarly 7% organizations are suffering from organizational work system cost and equipment and plant layout cost. Least cost involved areas are considered as product design. Administrative and finance cost are not problems for sampled organizations. Based on the above, it can be analyzed that no organizations give the priority for product design because they are giving continuity for same product for years. They can control the administrative cost and do not have high finance related cost. So it is not necessary for them to select the cost reduction program in these areas.

#### 4.1.4 Application of Cost Reduction Tools

As described earlier, there are various types of cost reduction tools, which are using by Japanese manufacturing organizations at present. This study deals whether Nepalese manufacturing organizations are applying the cost reduction program or not. If they are not applying such tools then it reveals the causes for it.

##### 4.1.4.1 Application of JIT System

**Table: 4.4**

**Application of JIT System: Sub-Sector Wise Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
<b>Applying (Yes)</b>	-	-	-	-	-	0	0
<b>Not Applying (No)</b>	2	3	5	3	2	15	100
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The study reveals that 100% organizations are not applying JIT system as cost reduction tools. It means that application of JIT system in Nepal is likely to be impossible. The main cause for it is non availability of supplier

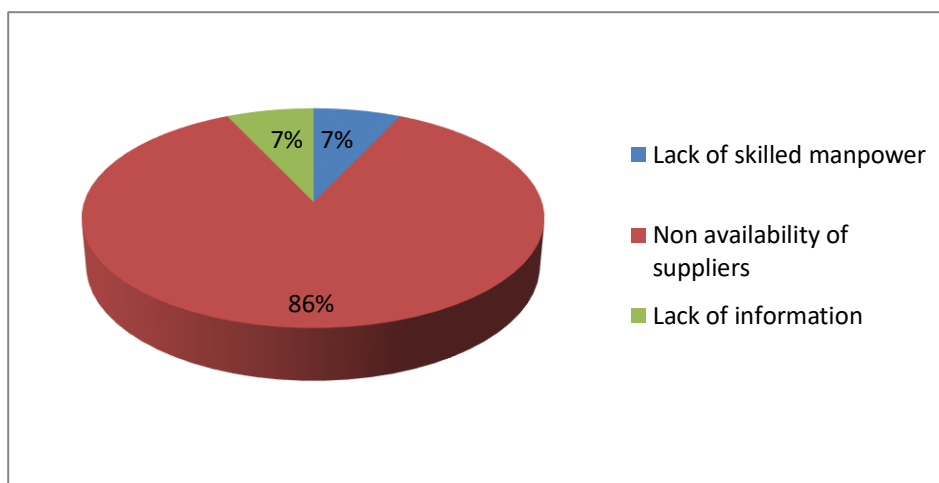
**Table: 4.5**  
**Practical Difficulties in Application of JIT System: Sub Sector Wise**  
**Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foams	Liquor s	Shoes	Total	
						No.	%
Lack of skilled manpower	-	-	1	-	-	1	7
Non availability of suppliers	2	3	3	3	2	13	86
Lack of information	-	-	1	-	-	1	7
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The above data can be presented by following Pie-Chart:

**Figure: 4.4**  
**Practical Difficulties in Application of JIT System: Sub Sector Wise**  
**Observation**



The above table & pie-chart shows that 86% manufacturing organizations are not applying JIT due to non availability of suppliers. 7% organizations think that lack of skilled manpower is the main cause for it. And 7% organizations think that they are not applying JIT tool because they do not have any idea about it.

#### 4.1.4.2 Application of Total Quantity Management (TQM)

**Table: 4.6**

**Application of TQM: Sub Sector Wise Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
<b>Applying</b>	2	3	5	3	2	15	100
<b>Not Applying</b>	-	-	-	-	-	-	-
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The data regarding application of Total Quality Management reveals that organizations are conscious to apply the TQM approach. 100% sampled manufacturing organizations are applying TQM tools to reduce the cost.

#### 4.1.4.3 Application of Target Costing

The status of application of Target Costing in Nepalese manufacturing organizations can be presented as follows.

**Table: 4.7**

**Application of Target Costing: Sub Sector Wise Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
<b>Applying</b>	2	3	3	3	0	10	67
<b>Not Applying</b>	-	1	2	-	2	5	33
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The study reveals that 67% manufacturing organizations are applying Target Costing. Whereas 33% manufacturing organizations are not applying Target Costing.

**Table: 4.8**  
**Practical Difficulties for Applying Target Costing: Sub Sector Wise**  
**Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Lack of skilled manpower	-	1	1	-	-	2	40
Lack of information	-	-	1	-	2	3	60
Lack of top management support	-	-	-	-	-	-	-
<b>Total</b>	-	1	2	-	2	5	100

Source: Field Survey, 2011

The above data shows that only five organizations are not applying Target Costing tool whereas 10 organizations are applying. The practical difficulties for not applying the Target Costing tool are lack of skilled manpower and lack of information. Out of them 40% organizations are facing the problem of skilled manpower and 60% are facing the problem of information.

#### 4.1.4.4 Application of Benchmarking

The status of application of Benchmarking in Nepalese manufacturing organizations can be presented as follows.

**Table: 4.9**  
**Application of Benchmarking: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Applying	2	3	5	3	-	13	87
Not Applying	-	-	-	-	2	2	13
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2011



The above data shows that 87% manufacturing organizations are practicing the Benchmarking system. It means, there is high competition among the organizations. Only 13% organizations are not applying the Benchmarking. Two shoe manufacturers are not applying Benchmark pricing because they thought that the demand is higher than the supply. So, it is not necessary to provide low price shoes in the market. They said that it was not necessary to follow such reduction tools

#### 4.1.4.5 Application of KAIZEN Costing

For knowing whether Nepalese firms conduct KAIZEN efforts in the area of cost reduction or not, the study reveals the following results:

**Table: 4.10**

**Application of KAIZEN Costing: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
<b>Applying</b>	1	1	1	1	-	4	27
<b>Not Applying</b>	1	2	4	2	2	11	73
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2011

The data reveals that 27% manufacturing organizations are using KAIZEN costing. But most sampled organizations (i.e. 73%) are not using KAIZEN costing. it shows that Nepalese manufacturing organizations are not conscious about KAIZEN costing.

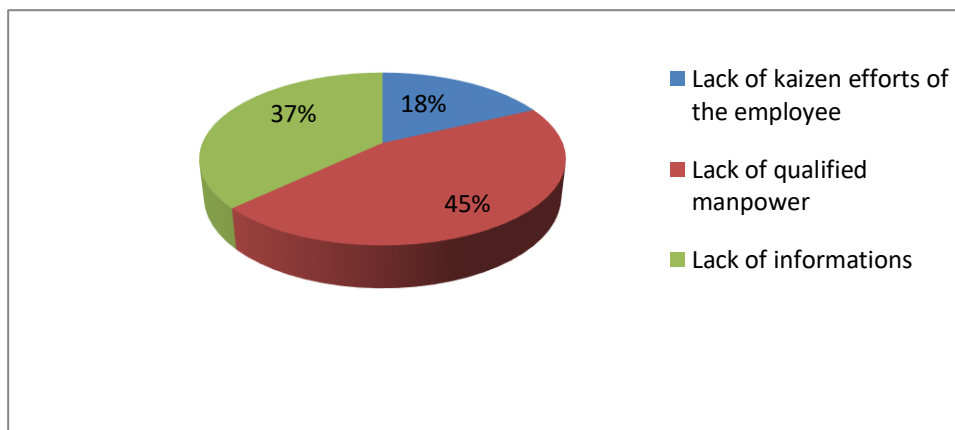
**Table: 4.11**  
**Practical Difficulties in Applying KAIZEN Costing: Sub Sector Wise**  
**Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Lack of kaizen efforts of the employee	-	1	-	1	-	2	18
Lack of qualified manpower	1	1	2	1	-	5	45
Lack of information's	-	-	2	-	2	4	37
<b>Total</b>	1	2	4	2	2	11	100

Source: Field Survey, 2010

The above data can be presented through following Pie-Chart:

**Figure: 4.5**  
**Practical Difficulties in Applying KAIZEN Costing**



The above table 4.11 shows that 18% organizations are not applying the KAIZEN costing due to the lack of KAIZEN efforts of the employees, 45% manufacturing organizations are facing the difficulty of qualified manpower where as 37% manufacturing organizations do not have proper information about KAIZEN.

#### 4.1.4.6 Application of Activity Based Management

The study made for knowing whether or not Nepalese manufacturing organizations are conducting ABM for reducing their cost, the data reveals the following facts:

**Table: 4.12**

**Application of Activity Based Management: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
Applying	2	3	4	2	2	13	87
Not Applying	-	-	1	1	-	2	13
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The above table 4.12 shows the 87% manufacturing organizations are applying Activity Based Management as cost reduction tool. It shows that most of organizations can define their activities clearly and they are able to reduce their cost by using ABM activity. Only 13% organizations are not applying such tool.

#### 4.1.4.7 Application of Life Cycle Costing

Most of Japanese manufacturing firms use life cycle costing before adopting any big project. Life Cycle Costing helps to reduce the overall cost of the project throughout the life of the project by selecting a best costing option. Reviewing the high success of Japanese firms, it is significant here to identify status of Life Cycle Costing practice in Nepalese manufacturing sector. Following facts are revealed:

**Table: 4.13**

**Application of Life Cycle Costing: sub sector wise observation**

particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
Applying	1	1	3	2	2	9	60
Not Applying	1	2	2	1	-	6	40
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The above table 4.13 shows that only 60% manufacturing organizations are applying Life Cycle Costing to reduce cost and only 40% organization are not applying life cycle costing. Comparatively, there is no high difference between the organizations applying and not applying the tool. It indicates that, lower portion of organizations are not applying the Life Cycle Costing.

**Table: 4.14**  
**Practical Difficulties in Applying Life Cycle Costing: sub sector wise observation**

particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
Lack of information	-	-	2	1	-	3	50
Lack of top management support	-	-	-	-	-	0	0
It does not help to cost reduction	1	2	-	-	-	3	50
Total	1	2	2	1		6	100

Source: Field Survey, 2010

The above table 4.14 shows that 6 organizations are not applying the cost reduction tool. Out of them, 3 organizations i.e. 50% are facing the problems of lack of information and 3 organizations i.e. 50% think that Life Cycle Costing does not help in regarding cost. And none of organizations think that they do have problem of top management support.

#### **4.1.4.8 Application of Reengineering as Cost Reduction Tool**

Reengineering is the change of production process. When a process technology seems more consuming or ineffective or time consuming, it needs change. It is called Reengineering process technology. In the context of Nepalese manufacturing organizations, these facts are identified:

**Table: 4.15****Application of Reengineering: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Applying	2	2	2	3	-	9	60
Not Applying	-	1	3	-	2	6	40
Total	2	3	5	3	2	15	100

Source: Field Survey, 2010

The above table 4.15 shows that 60% organizations are applying Reengineering as cost reduction tool where as 40% organizations are not applying Reengineering as cost reduction tool. It can be said that there is a big problem in applying Reengineering as cost reduction tool. Out of fifteen organizations, nine organizations are applying the tool and six organizations are not applying reengineering as cost reduction tool.

**Table: 4.16****Practical Difficulties in Applying Reengineering: sub sector wise observation**

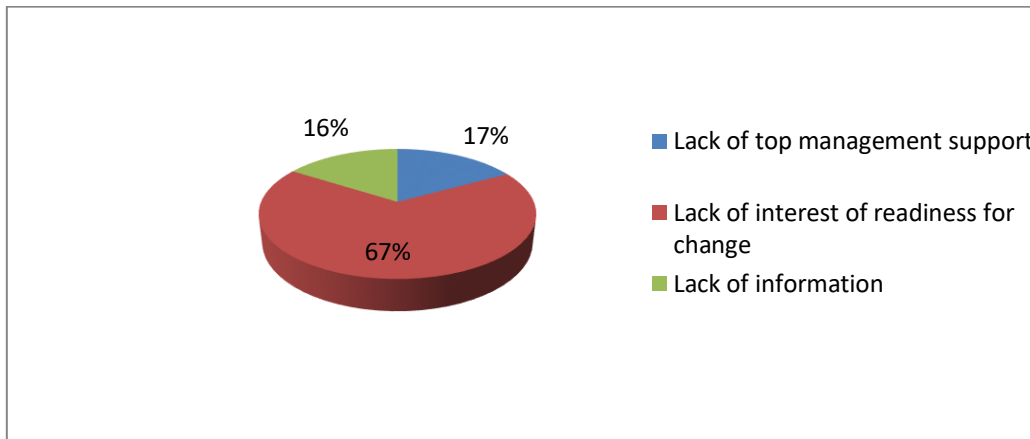
Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Lack of top management support	-	-	1	-	-	1	17
Lack of interest of readiness for change	-	1	1	-	2	4	67
Lack of information	-	-	1	-	-	1	16
Total		1	3		2	6	100

Source: Field Survey, 2010

The above data can be presented by following Pie-Chart:

**Figure No. : 4.16**

**Practical Difficulties in Applying Reengineering**



The above table 4.16 shows that 67% manufacturing organizations are not applying the Reengineering as cost reduction tool due the lack of interest of readiness for change. And 17% organizations are facing the difficulty of lack of top management support. Whereas, 16% organizations do not have proper information's. So, it can be said that most of the organizations are not ready to adopt new production system.

**4.1.4.9 Application of Theory of Constraints**

The study made for knowing whether or not Nepalese manufacturing organizations are conducting Theory of Constraints as cost reduction tool, the following data are revealed:

**Table: 4.17**

**Application of Theory of Constraints: Sub Sector Wise of Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
<b>Applying</b>	2	3	-	-	-	5	33
<b>Not Applying</b>	-	-	5	3	2	10	67
<b>Total</b>	2	3	5	3	2	15	100

Annual report Source: Field Survey, 2010

The above table 4.17 shows that 67% manufacturing organizations are not applying Theory of Constraints as cost reduction tool. Only 33% organizations are applying

such tool. It means that only few organizations are conscious about using of Theory of Constraint. Most of organizations are not aware about Theory of Constraint.

**Table 18**  
**Practical Difficulties in Applying Theory of Constraint: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquors	Shoes	Total	
						No.	%
Lack of knowledge	-	-	5	3	2	10	100
Lack of top management support	-	-	-	-	-	0	0
Not applied by other organizations	-	-	-	-	-	0	0
<b>Total</b>	0	0	5	3	2	10	100

Source: Field Survey, 2010

The above table 4.18 shows that ten organizations are facing practical problems in applying Theory of Constraints. Out of ten organizations, ten organizations, i.e. 100% do not have proper knowledge about Theory of Constraints. So, knowledge of TOC is the main problem to apply this tool for reducing cost.

#### **4.1.4.10 Application of Balance Scorecard**

Study of these fifteen manufacturing organizations shows the following results regarding the current practice of these organizations for the application of Balance Scorecard.

**Table: 4.19**

**Application of Balance Scorecard: sub sector wise observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Applying	1	1	-	-	-	2	13
Not Applying	1	2	5	3	2	13	87
Total	2	3	5	3	2	15	100

The above table 4.19 shows that thirteen organizations i.e. 87% of total sampled organizations are not applying Balance Scorecard. It can be said that most of the organization are not applying Balance Scorecard as cost reduction tool.

**Table: 4. 20**

**Practical Difficulties in Application of Balance Scorecard: Sub Sector Wise Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Lack of knowledge	1	2	5	3	2	13	100
Lack of top management support	-	-	-	-	-	0	0
Lack of information	-	-	-	-	-	0	0
Total	1	2	5	3	2	13	100

Source: Field Survey, 2010

The above table 4.20 shows that 100% organizations are facing practical problems to use Balance Scorecard due to lack of knowledge. They do not have proper knowledge about balance scorecard.

**4.1.4.11 Management View Regarding Necessity for Applying Cost Reduction Tools in organizations**

The survey made for knowing what the top managerial level think, the necessity for applying cost reduction tools in organizations reveal the following results:



**Table: 4.21**

**View Regarding Necessity for Applying Cost Reduction Tools: Sub Sector Wise  
Observation**

Particulars	Food & Beverage	Irons & Steels	Plastics & Foam	Liquor s	Shoes	Total	
						No.	%
Yes	2	3	5	3	2	15	100
No	-	-	-	-	-	-	0
<b>Total</b>	2	3	5	3	2	15	100

Source: Field Survey, 2010

The above table 4.21 shows that 100% organizations have positive views regarding application of cost reduction tools. No one of them think that such tools cannot be helpful to reduce the cost of organizations.

#### **4.2 Testing of Hypothesis**

The hypothesis is that application of cost reduction tools is identical i.e. no significant difference among sub-sectors and among tools of cost reductions.

The total numbers of sampled manufacturing organizations are fifteen from different sub sectors. From Food and Beverage sub sector total two organization were sampled, where three organizations were sampled from each Liquors and Irons and Steels sub sector. Similarly, five organizations were sampled from Plastics and Foam and two organizations were sampled from Shoes sub sector.

To give equal justice to all sub sectors, LCM has been computed which comes 30. Then weight has been calculated dividing that 30 by the number of samples from each particular sub sector and assigned to them. Based on the weight assigned, the data regarding the number of organizations from different sub-sectors applying different cost reduction tools has been restructured. The works have been shown in the restructured data as follows:

**Table: 4.22****Data Regarding Number of Organizations from Different Cost Reduction****Tools: Sub Sector Wise Observation**

<b>Tools</b> \ <b>Sub Sector</b>	<b>Food &amp; Beverage (XA)</b>	<b>Irons &amp; Steels (XB)</b>	<b>Plastics &amp; Foam (XC)</b>	<b>Liquors (XD)</b>	<b>Shoes (XE)</b>	<b>Total</b>
JIT System (X1)	0	0	0	0	0	0
TQM Approach (X2)	30	30	30	30	30	150
Target Costing (X3)	30	20	18	30	0	98
KIAZEN (X4)	15	10	6	10	0	41
ABM (X5)	30	30	24	20	30	134
Reengineering (X6)	30	20	12	30	0	92
TOC (X7)	30	30	0	0	0	60
Life Cycle Costing (X8)	15	10	18	20	30	93
Balance Scorecard (X9)	15	10	0	0	0	25
Benchmarking (X10)	30	30	30	30	0	120
<b>Total</b>	<b>225</b>	<b>190</b>	<b>138</b>	<b>170</b>	<b>90</b>	<b>813</b>

Assuming level of significance is 5%

i) Null Hypothesis:  $H_0: \pi_A = \pi_B = \pi_C = \pi_D = \mu_E$

(i.e. there is no significant differences by sub sector areas)

Alternative Hypothesis:  $H_1: \mu_1 \neq \mu_A \neq \mu_B \neq \mu_C \neq \mu_C \neq \mu_D \neq \mu_E$

(i.e. there is significant difference by sub sector areas)

ii) Null Hypothesis:  $H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8 = \mu_9 = \mu_{10}$

(i.e. there is no significant difference by types of cost reduction tools)

Alternative Hypothesis:  $H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8 \neq \mu_9 \neq \mu_{10}$

(i.e. there is significant difference by types of cost reduction tools)

All values are presented below:

**Table: 4. 23****Two-Way ANOVA Table**

<b>Source of variation</b>	<b>Degree of freedom</b>	<b>Sum of squares</b>	<b>Mean sum of squares</b>	<b>F-Ratio</b>
<b>Due to column factor</b>	5-1=4	1057.52	264.38	Fc = 3.63
<b>Due to row factor</b>	10-1=9	4176.42	475.16	Fr = 6.27
<b>Due to error</b>	4x9=36	2625.68	72.94	

Sources: Appendix

- i) The variance ratio for column/sub sector is 3.63. The critical value of F at 5% level of significance for (4,36) d.f. is 2.66

Decision: Since, the calculated value of F is greater than the tabulated value for (4,36) d.f. Thus, Null Hypothesis is not accepted. Therefore, it is concluded that application of cost reduction tools is not identical among sub sectors.

- ii) The variance ratio for row/cost reduction tools is 6.27. The critical value of F for (9,36) d.f. is 2.16.

Decision: Since, the calculated value of F is greater than the tabulated value for (9,36) d.f. Thus, Null Hypothesis is not accepted. Therefore, it is concluded that application of cost reduction tools is not identical among cost reduction tools.

### 4.3 Percentage of Applying and not Applying Cost Reduction Tools

**Table: 4.24**

#### **Percentage of Applying and not Applying Cost Reduction Tools: Tools Wise Observation**

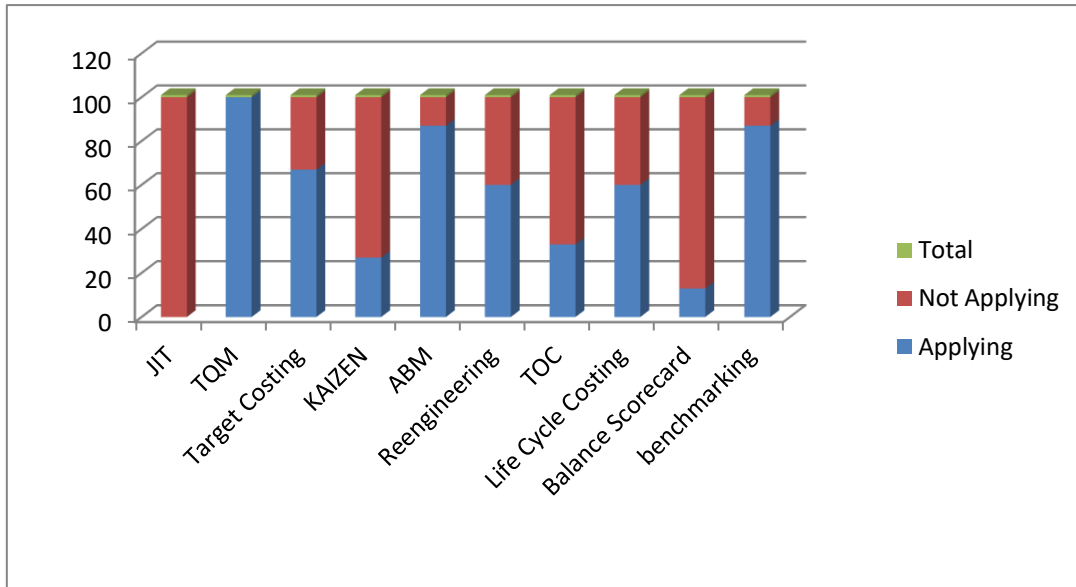
Tools	Applying	Not Applying	Total
JIT	0	100	100%
TQM	100	0	100%
Target Costing	67	33	100%
KAIZEN	27	73	100%
ABM	87	13	100%
Reengineering	60	40	100%
TOC	33	67	100%
Life Cycle Costing	60	40	100%
Balance Scorecard	13	87	100%
benchmarking	87	13	100%

Source: Filed Survey, 2010

The above table 4.24 can be presented by following Bar-Diagram

**Figure: 4.7**

**Percentage of Applying and not Applying Cost Reduction Tools:  
Tools Wise Observation**



The above figure 4.7 shows the individual position of cost reduction tools. JIT system has not been applied by any organizations. TQM has been applied by all organizations. And other facts are shown on above figure.

**4.4 Percentage of Applying and not Applying  
Cost Reduction Tools**

**Table: 4.25**

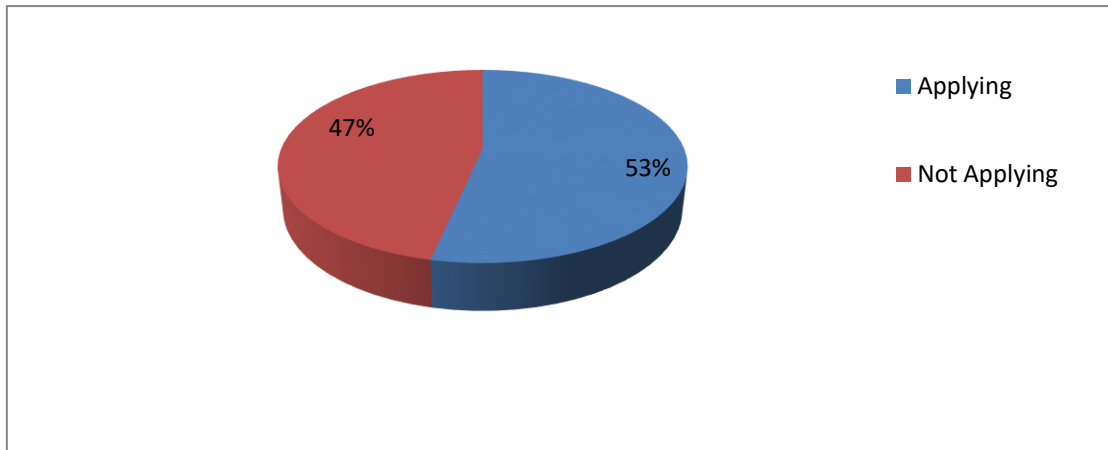
**Percentage of Applying and not Applying Cost Reduction Tools:  
Overall Observation**

Particular	Percentage
Applying	53.4%
Not Applying	46.6%
Total	100%

The above table 4.25 shows the percentage of applying cost reduction tools sampled in fifteen organizations is 53.4% and the percentage not applying cost reduction tools is 46.6%.

The above data can be presented by following Pie-Chart:

**Figure: 4.8**  
**Percentage of Applying and not Applying Cost Reduction Tools:**  
**Overall Observation**



The above figure 4.8 shows that 53.4% organizations are applying cost reduction tools whereas 46.6% organizations are not applying cost reduction tools.

#### **4.5 Major Findings**

The research works related to Application of Cost Reduction Tools in Nepalese manufacturing organizations based on Kathmandu valley have found the following facts:

- It is found that 53.4% cost reduction tools are being applied by manufacturing organization at present and 46.6% tools are not being applied.
- It is found that 100% manufacturing organizations are not applying JIT system as cost reduction tools at present. Most of the firms (i.e. 86%) think it is due to non availability of suppliers.
- Cent percent manufacturing organizations are applying Total Quality Management approach as cost reduction tool. It means that all organization is conscious about quality aspect of product.
- It is found that 67% manufacturing organizations are applying Target Costing as cost reduction tool and 33% are not applying. The main cause for not applying Target Costing is lack of information (i.e. 60%) and secondary cause is lack of skilled manpower.

- Only 27% organizations are applying KAIZEN system as cost reduction tools. It is found that Khajuriko Nepal Pvt. Ltd is selected as model organizations using KAIZEN costing in Kathmandu valley. It is also found that Nevico Pvt. Ltd. Used KAIZEN for 3 years only. But now, it is not using due to lack of top management support.
- Most of organizations (87%) are applying ABM as cost reduction tool. The main cause that they are not applying ABM, is difficulties in defining activities.
- It is found that the percentage ration between applying and not applying Reengineering and Life Cycle Costing as cost reduction tool is 60:40. The practical problems in applying such tools are lack of proper information, lack of skilled manpower.
- 33% organizations are applying TOC as cost reduction tools and 13% organizations are applying balance scorecard as cost reduction tools. These tools are totally new for Nepalese manufacturing organizations.
- It is found that 87% Nepalese manufacturing organizations are applying benchmarking as cost reduction tool. Only 13% manufacturing organizations are not applying benchmarking.
- It is found that sent percent organizations think application of cost reduction tools help to reduce cost scientifically.
- It is also found from research work that 67% manufacturing organizations think that increase in volumes of sales maximize profit cum wealth. And only 33% organizations think that reduction of cost scientifically helps to maximize profit cum wealth maximization objectives.
- Similarly, 47% manufacturing organizations believe that management of the cost in a scientific way helps in lowering the price of product to customer. 33% of the organizations minimize the profit margin on sales. 20% of the organizations bargain with suppliers for lowering the price of products.

# **CHAPTER-V**

## **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Summary**

Most of organizations are facing throat cutting competition in today's business environment. A single mistake can be the main cause to lose whole market share. That may be the cause of organizations liquidation. So, running of any business organization successfully is very challenging job nowadays. After industrialization, American and European countries established multinational companies around the world in search of materials for productions. Though lack of materials for production for their companies, these countries have maintained low cost of production.

Nepalese manufacturing organizations are facing the problem of high cost of materials and lack of materials. Similarly, they also do not have proper knowledge of management and other ideas about running the business successfully. High cost of production is headache of Nepalese manufacturing organizations. There are lots of tools and techniques to reduce the cost of productions. Most of tools have been innovated by Japanese manufacturing organizations. And these tools are being applied by Japanese manufacturing organizations at present. So, we must understand that the key of success of Japanese organizations is proper application of such tools. This research work has been done with the objective of identifying the current state of the application of cost reduction tools in Nepalese manufacturing organization, pointing out the finding the practical difficulties for applying cost reduction tools in Nepalese manufacturing organizations and providing suggestions for the application of cost reduction tools to organization as well as to government.

As Nepal has entered into WTO membership and has signed the protocol of SAFTA, it has to liberalize its market and resultantly the products of foreign manufacturing organization freely move within the country. Hence, Nepalese manufacturing organizations have to further complete with their foreign competitors. The work for

the country is now for making Nepalese products cheaper than imported products. This necessitates cost reduction practice in Nepalese industrial sectors. Mass participation, wide communication and effective training within the organization can only help to use cost reduction tools in organizations. Management tools like leadership, motivation etc should be used. There are several areas where cost reduction works can be exercised. Some of these areas are product design, organizations' product planning and control, equipment and plant lay out, purchase and control of materials etc. for cost reduction, the modern Japanese tools are being used which are JIT system, TQM, ABM, Benchmarking, Test Costing, Reengineering, Lifecycle Costing, Theory of Constraints, Balance Scorecard, and KAIZEN.

One of the main factors of success of Japanese manufacturing organization is application of JIT as a cost reduction tools. The JIT philosophy made famous by Toyota which has been credited with success of many of the world's leading manufactures. But in Nepal, none of the organizations are applying JIT as cost reduction tool. So, it is very miserable condition for Nepalese manufacturing organizations.

In 1980s, most European and American companies considered quality to be an additional cost of manufacturing, but by the end of the decade, they began to realize that quality saved money. Companies discovered that it was cheaper to produce items for the first time correctly rather their wasting responses by making substandard items that have to be detected, reworked, scrapped or returned by customers. In other words, the emphasis of TQM is to design and build quality , rather than trying to inspect it, by focusing on the causes rather than the symptoms of poor quality.

Similarly, Activity Based Management, KAIZEN costing, Benchmarking, Target Costing, Life Cycle Costing, Reengineering. Theories of Constraints also help to reduce the cost of production. Most of the tools are innovated by Japan. So, Japanese manufacturing organizations are getting success. It is very much necessary to apply such tools in Nepalese manufacturing organizations too.



## 5.2 Conclusion

After the research works made on the topic 'Application of Cost Reduction Tools in Nepalese manufacturing organizations', following conclusions have been drawn.

- In the context of Nepalese manufacturing organizations based on Kathmandu valley, most of organizations prefer to increase in volume and reduction in operating cost for maximizing profit of the organization.
- Most of organizations prefer managing the cost scientifically for the purpose of lowering the operating cost and consequently the price of products.
- Nepalese manufacturing organizations are facing high cost problem in various sectors the major sectors are production planning and control, advertising and selling and distribution areas.
- JIT system is not applied by Nepalese manufacturing organizations. Its main cause is that it is identified as non availability of suppliers.
- TQM is widely applied by Nepalese manufacturing organizations. It can be concluded that most of the organizations are conscious about quality factors.
- Similarly most of the organizations are applying Target Costing as cost reduction tool.
- KAIZEN costing is not widely applied by Nepalese manufacturing organizations. The main problem for it is lack of proper information as well as lack of skilled manpower.
- Major portion of sampled organizations are applying ABM as cost reduction tool. It shows that less organization are unable to use ABM. And they are facing the problem in defining the activities.
- TOC and Balance Scorecard are new for most of organizations. They do not have proper knowledge about them. So least organizations are applying such tools.
- The ratio of applying Life Cycle Costing and Reengineering is 60:40. So, it can be said that the application of these tools are satisfactory.
- Most of the organizations follow Benchmark techniques as cost reductions tool. It can be concluded that most of the organizations want to follow what leading organizations are doing at present in overall cost reduction approach.

- In this way, it can be concluded that 53.4% organization are following cost reeducation techniques. But 46.6% organizations are not applying cost reduction tools.
- It can be said, that Nepalese manufacturing organizations are not applying cost reduction tools because null hypothesis is not accepted.

Finally, it can be concluded that Nepalese manufacturing organizations based on Kathmandu valley are not applying cost reduction tools.

### **5.3 Recommendations**

We know that, Nepal is in transitional period. It is in the process of making new constitution. Nepal is declared federal republican country. So, Nepalese manufacturing organizations are in also transitional period. They are waiting the full fledged government policy regarding manufacturing organizations. So, they are thinking of facing new situations. On the other side, Nepal is now the member of economic groups like, WTO, SAFTA, BIMSTEC etc. Now, Nepalese manufacturing sectors have to complete with international products. Cost reduction techniques may be the best tools to overcome such situation for Nepalese manufacturing organizations. Based on the findings and conclusions of this research work, following recommendations have been forwarded to Nepalese manufacturing sectors and Nepalese government and future researchers for effectiveness of cost reduction tools.

#### **5.3.1 Recommendation to Nepalese Manufacturing Organizations**

Due to the lack of knowledge about cost reduction tools, Nepalese manufacturing organizations are not applying such tools properly. So, they are facing high cost problem. From the findings and conclusions, it is recommended to use using cost reduction tools effectively. For this, they have to train their employees to use such tools. They have to collect information's about success of Japanese organizations by applying cost reduction tools. JIT system has not been applied by any organizations, so it is necessary to use JIT system. Firms should manage activities with cost. Nepalese manufacturing organizations should follow KAIZEN costing as cost reduction tool.

### **5.3.2 Recommendation to Nepal Government**

The knowledge about cost reduction in Nepalese manufacturing organizations is very low i.e. organizations have no enough knowledge about cost reduction tools. Organizations who have knowledge about facing various difficulties and complexities for cent percent application. So, government should take responsibility for it. Government should run campaign in manufacturing organizations to increase the level of application for cost reduction in every sector. For this government should play partnership role by giving various training and guideline to Nepalese manufacturing organizations. Government should make clear legal provisions about cost reduction problem. It is found that most of the organizations want to apply tools but they do not have any idea about this. So, government should facilitate them.

### **5.3.3 Recommendation for Future Researchers**

- Present study can be a valuable piece of the research work in cost reductions system especially in manufacturing business sectors. It may be valuable for academicians, practicing managers and any others who are directly or indirectly involved in business, governmental and non-governmental sectors. After analysis, the researcher recommends to highlight the guidelines to put forward for better improvement.
- A detail investigation of causal linkage of cost reduction system and organizational performance can be conducted.
- The study may be conducted to investigate the reasons behind efficiency or inefficiency of cost reduction system.
- It can be increased the sample size of the firm to get more reliable result.
- Similarly, 47% manufacturing organizations believe that management of the cost in a scientific way helps in lowering the price of product to customer. 33% of the organizations minimize the profit margin on sales. 20% of the organizations bargain with suppliers for lowering the price of products.

- It is found that 95 percent organizations think application of cost reduction tools help to reduce cost scientifically it can be studied between as well as private manufacturing organizations. 95 percent manufacturing organizations are applying Total Quality Management approach as cost reduction tool. It means that all organization is conscious about quality aspect of product.
- In the context of Nepalese manufacturing organizations based on Kathmandu valley, most of organizations prefer to Decreasing in volume and reduction in operating cost for Minimization profit of Maximization the organization.
- Most of organizations prefer managing the cost scientifically for the purpose of lowering the operating cost and consequently the price of products. Nepalese manufacturing organizations are facing high cost problem in various sectors the major sectors are production planning and control, advertising and selling and distribution areas. The management are recommended to apply the supervision system in order to implement the currently used tools and techniques properly. Similarly, they are suggested to establish an information system to use the new tools and techniques in order to reduce cost to the minimum level.
- Involvement of top management is higher in order to implement the target costing system in Nepalese manufacturing companies.

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## APPENDIX

### 1. Computation of weight

- i. LCM comes to 30 from 2,3,5,3,2
- ii. Weight of each sub-sector =  $\frac{LCM}{Respective\ NS}$
- iii. Value of each sub-sector = Weight x No. of sample applying cost reduction tools.

### 2. Data have been restructured as follows.

particulars	Food and Beverage (A)	Irons and Steels (B)	Plastics and Foam (C)	Liquors (D)	Shoes (E)	X <sup>2</sup> <sub>A</sub>	X <sup>2</sup> <sub>B</sub>	X <sup>2</sup> <sub>C</sub>	X <sup>2</sup> <sub>D</sub>	X <sup>2</sup> <sub>E</sub>	Σ <sub>p</sub> E	ΣE <sup>2</sup> <sub>p</sub>
JIT	15x0=0	10x0=0	6x0=0	10x0=0	15x0=0	0	0	0	0	0	0	0
TQM	15x2=30	10x3=30	6x5=30	10x3=30	15x2=30	900	900	900	900	900	150	4500
TC	15x2=30	10x2=20	6x3=18	10x3=30	15x0=0	900	400	324	900	0	98	2524
Kaizen	15x1=15	10x1=10	6x1=6	10x1=10	15x0=0	225	100	36	100	0	41	461
ABM	15x2=30	10x3=30	6x4=24	10x2=20	15x2=30	900	900	576	400	900	134	3676
Reengineering	15x2=30	10x2=20	6x2=12	10x3=30	15x0=0	900	400	144	900	0	92	2344
TOC	15x2=30	10x3=30	6x0=0	10x0=0	15x0=0	900	900	0	0	0	60	1800
Life Cycle	15x1=15	10x1=10	6x3=18	10x2=20	15x2=30	225	100	324	400	900	93	1949
S	15x1=15	10x1=10	6x0=0	10x0=0	15x0=0	225	100	0	0	0	25	325
Benchmarking	15x2=30	10x3=30	6x5=30	10x3=30	15x0=0	900	900	900	900	0	120	3600
Σ <sub>p</sub> E	225	190	138	170	90	6075	4700	3204	4500	2700	T=813	ΣE <sup>2</sup> <sub>p</sub> =X <sub>p</sub>

### 3. The computation of Correction factor,

Total sum of squares (TSS), sum of squares due to sector (SSC) and sum of squares due to types of tools (SSR) have been calculated below:

$$i. \text{ Correction Factor (C.F.)} = \frac{T^2}{N} = \frac{(813)^2}{5 \times 10}$$

$$\therefore \text{C.F.} = 13219.38$$

$$ii. \text{ Total sum of Squares (TSS)} = \sum X^2_{rc} - \text{C.F.}$$

$$= 21179 - 13219.38$$

$$= 7959.62$$



iii. Sum of Squares between columns/sub-sector

$$\begin{aligned}(\text{SSC}) &= \frac{\sum(Xc)^2}{nr} - C.F. \\ &= \frac{(225)^2}{10} + \frac{(190)^2}{10} + \frac{(138)^2}{10} + \frac{(170)^2}{10} + \frac{(90)^2}{10} - 13219.38 \\ &= 14276.9 - 13219.38 \\ \therefore \text{SSC} &= 1057.52\end{aligned}$$

iv. Sum of squares between rows/types of tools

$$\begin{aligned}(\text{SSR}) &= \frac{\sum(Xr)^2}{nc} - C.F. \\ &= \frac{(0)^2}{5} + \frac{(150)^2}{5} + \frac{(98)^2}{5} + \frac{(41)^2}{5} + \frac{(134)^2}{5} + \frac{(92)^2}{5} + \frac{(60)^2}{5} + \frac{(93)^2}{5} + \frac{(25)^2}{5} + \\ &\frac{(120)^2}{5} - 13219.38 \\ &= 17495.8 - 13219.38 \\ \therefore \text{SSR} &= 4276.42\end{aligned}$$

v. Sum of squares as the residuals/errors

$$\begin{aligned}\text{SSE} &= \text{TSS} - \text{SSC} - \text{SSR} \\ &= 7959.62 - 1057.52 - 4276.42 \\ \therefore \text{SSE} &= 2625.68\end{aligned}$$

## Appendix I

### Research Questionnaires

[Please make a tick mark on the following options and express your opinion towards your choice wherever necessary]

**Q.No.1 Which of the following options does your organization give priority for the profit cum wealth maximization?**

- a. Increase in volume of sales ( )
- b. Increase in selling price ( )
- c. Reduce in cost ( )

**Q.No.2 Do you know that the use of some tools can help to reduce cost?**

- a. Yes
- b. No

**Q.No.3 To reduce the cost of purchase to the customers, which of the following methods is your organization using at present?**

- a. Bargaining with the suppliers of materials. ( )
- b. Managing the cost in a scientific way. ( )
- c. Minimizing its margin on sales. ( )

**Q.No.4 In which of the following area is your organization suffering from cost problem and requires cost reduction program?**

- a. Product Design ( )
- b. Organization work system ( )
- c. Production planning and control ( )
- d. Equipment and plant lay out ( )
- e. Administrative ( )
- f. Selling and distribution ( )
- g. Finance ( )
- h. Purchase of materials and control ( )

**Q.No.5 Do top managerial levels of your organization know about cost reduction tools existing in management system?**

- a. Yes ( )                      b. No ( )

**Q.No.6 Does your organization use JIT approach to reduce inventory cost?**

- a. Yes ( )                      b. No ( )

**Q.No.7 If JIT system has not been used in organization, what are the causes for it?**

- a. Lack of skilled and experienced man-power ( )  
b. Non-availability of suppliers ( )  
c. Lack of information ( )  
d. Other, if any, please specify.....

**Q.No.8 Does your organization use Total Quality Management (TQM) approach?**

- a. Yes ( )                      b. No ( )

**Q.No.9 If TQM has not been applied in organization, what are the causes for it?**

- a. Lack of skilled manpower ( )  
b. Quality is not the problem ( )  
c. Lack of team spirit in the employees ( )  
d. Other, if any, please specify.....

**Q.No.10 Does your organization apply target costing tool for cost reduction?**

- a. Yes ( )  
b. No ( )

**Q.No.11 If Target Costing has not been applied, what might be the reason for the failure for applying it?**

- a. Lack of skilled manpower ( )  
b. Lack of information ( )  
c. Lack of top management support ( )  
d. Other, if any, please specify.....

**Q.No.12 Does your organization follow Benchmarking?**

- a. Yes ( )
- b. No ( )

**Q.No.13 If Benchmarking Costing has not been applied, what might be reasons for it?**

- a. Lack of perfect knowledge ( )
- b. Lack of top management support ( )
- c. Lack of information ( )
- d. Other, if any, please specify.....

**Q.No.14 Does your organization apply KAIZEN costing system?**

- a. Yes ( )
- b. No ( )

**Q.No.15 If KAIZEN has not been applied, what might be reason for it?**

- a. Lack of KAIZEN efforts of the employees ( )
- b. Lack of qualified manpower ( )
- c. Other, if any please specify.....

**Q.No.16 Does your organization apply Activity Based Management (ABM)?**

- a. Yes ( )
- b. No ( )

**Q.No.17 If ABM has not been applied, what might be the reason for it?**

- a. Problems in defining activity ( )
- b. Lack of top management support ( )
- c. Lack of proper information ( )
- d. Other, if any, please specify.....

**Q.No.18 Does your organization apply Reengineering as cost reduction tool?**

- a. Yes ( )
- b. No ( )

Q.No.19 If Reengineering has not been applied what might be reason for it?

- a. Lack of top management support ( )
- b. Lack of readiness for change ( )
- c. Lack of proper market information ( )
- d. Other, if any, please specify.....

Q.No.20 Does your organization applies Theory of Constraints (TOC) as cost management tool?

- a. Yes ( )
- b. No ( )

Q.No.21 If has not been applied, what might be the reason for it?

- a. Lack of knowledge about TOC ( )
- b. Lack of top management support ( )
- c. Not applied by the organizations ( )
- d. Other, if any, please specify.....

Q.No.22 Does your organization apply Life Cycle Costing?

- a. Yes ( )
- b. No ( )

Q.No.23 If Life Cycle Costing has not been applied in your organization what might be the reason for it?

- a. Lack of proper information ( )
- b. Lack of top management support ( )
- c. Your organization think that it does not help in reducing cost ( )
- d. Other, if any, please specify.....

Q.No.24 Does your organization use Balance Scorecard?

- a. Yes ( )
- b. No ( )

Q.No.25 If Balance Scorecard has been not applied in your organization, what might be the reason for it?

- a. Lack of proper knowledge ( )
- b. Lack of top management support ( )
- c. It requires skilled manpower ( )
- d. Other, if any, please specify.....

Q.No.26 Do you really think that cost reduction tools are effective in reducing cost?

- a. Yes ( )
- b. No ( )

Name of Respondent: .....

Position: .....

Organization: .....

Age: .....

Gender: .....

Again thank you for your valuable information and kind co-operation.