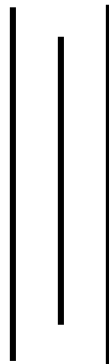


APPLICATION OF COST REDUCTION TOOLS BY NEPALESE MANUFACTURING ENTERPRISES

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RECOMMENDATION

This is to certify that the Thesis

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STUDY OF CORPORATE DEBT MARKET IN NEPAL

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*and found the thesis to be the original work of the student and written
according to the prescribed format. We recommend the thesis to
be accepted as partial fulfillment of the requirement for*

Master Degree of Business Studies (M.B.S.)

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DECLARATION

I hereby declare that the work reported in this thesis entitled '**Application of Cost Reduction Tools by Nepalese Manufacturing Enterprises**' submitted to SDC, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement of Degree of Master in Business Studies (MBS) under the supervision of Mr. Yamesh Man Singh, Associate Professor of Shanker Dev Campus.

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Cost Reduction is one of the important issues today. Daily, we hear news regarding either liquidation of many manufacturing organizations or handing over of much government - owned organizations to the private sector. Therefore, this study is an attempt to closely know about the modern Cost Reduction Tools widely used by the Japanese Manufacturing Enterprises at present which have led them to a great success. Further this study tries to know whether any of those tools are being applied in Nepalese Manufacturing Sector, and if not, what are their failures for applying the tools.

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Arjun Prasad Sah

Researcher

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ABBREVIATIONS

ABC	Activity Based Costing
ABCM	Activity Based Cost Management
ABM	Activity Based Management
BIMSTEC	Bay of Bengal Initiative for Multi Sectoral Technical & Economic
CBS	Central Bureau of Statistics
Chem. & Pham	Chemical and Pharmaceutical
	Co-operation
e.g.	Example
El. & Elec	Electrical and Electronic
FBT	Food, Beverages and Tobacco
GDP	Gross Domestic Product
Govt.	Government
IMA	Institutions of Management Accountants
ISO	International Organization for Standardization
JIT	Just in Time
Mgmt.	Management
RONAST	Royal Nepal Academy of Science & Technology
SAARC	South Asian Association for Regional Cooperation
SAFTA	South Asian Free Trade Area
SSS	Standardization, Simplification and Specialization
Tec. & Eng	Technical and Engineering

Tex. & Gar	Textile and Garment
TQC	Total Quality Control
TQM	Total Quality Management
TU	Tribhuvan University
UK	United Kingdom
USA	United States of America
VA	Value Analysis
VE	Value Engineering
Vs	Versus
WTO	World Trade Organization

CHAPTER- I

INTRODUCTION

1.1 General Background

Nepal is located in between the most populous countries of the world, India in the east, south, west, and China in the north. Nepal is landlock country covering 1,47,181 sq. Km area. The total population of Nepal is around 20.6 million with the growth rate of 2.08 percent per annum. It is a land of legends. It is filled up with natural beauties & a curio of traditional craftsmanship. Here are the world's highest mountains including Sagarmatha (Mt. Everest). Its snow fed mountains, lakes, rare wild life, rocky gorges, turbulent rivers and graceful waterfalls are a constant source of attraction & inspirations. Agriculture is the mainstay of Nepalese economy. Most of the working populations of Nepal are dependent upon it.

Nepal is the only Hindu kingdom in the world. Hinduism & Buddhism are the main religious creeds of Nepal. The rich cultural heritage of Nepal can be seen in the diverse social customs & frequent socio-religious festivals which spill into the streets & squares of the country. Temples, images, sacred paintings & mystic symbols are seen everywhere in Nepal. It is a living museum of arts & architecture. It is divided into 75 districts, 14 zones & 5 development regions. It has 3095 village development committees & 36 municipalities.

Nepal is a peace loving country & has persuaded an independent foreign policy. Nepal has followed a non-aligned foreign policy. It has a great faith in UNO & advocates strengthening of natural respect, economic co-operation, cultural exchange and a free flow of information among Nations. Nepal has been actively co-operating with UN peace missions by sending Nepal Army contingents in UN peace keeping operations & thus contributing wholeheartedly to the cause of peace & progress in the world (Souvenir, 1995:3-4).

Nevertheless, before 1936, various Crafts and Cottage Industries flourished within the country. Nepalese art was very famous, especially in Tibet China and India. Cottage industries were opened for spinning and weaving cotton and wool. Paper industries, Shoe industries and industry producing leather products, wooden products metal products had also been in abundance. Similarly, watermills were also popular at that time for grinding of grains such as rice, wheat, corns, millets etc. Those mills were revealing the best examples of appropriate technology of that time. During initial periods, the British railway service along Nepalese boarder gave enough encouragement to Nepalese industries set up in Terai towns. Later, they were closed due to adverse effect of import of machine-made cheaper products from British India.

When Ranas came into power, they isolated the country from the winds of industrial revolution, which is flowing in Europe. It did not encourage the growth of modern industries based on new technology (Lohani, 1973:203).

In order to reap quick benefits from the shortages of consumer goods created by the Second World War, the following industries established haphazardly:

- Biratnagar Jute Mills (1936): Joint Venture of Nepal and India, the first modern industry of Nepal.
- Five other Mills (1936-1938): Morang Sugar Mill, Juddha Match Factories at Biratnagar and Birgunj, Rice and Oils Mills.
- Fourteen Other Mills (1938-1945): They consisted of cotton, ceramics, cigarette, glass, chemicals, bobbin and plywood, hydropower, furniture, soap, paper and ayurvedic medicine etc.

After the end of Second World War, Biratnagar Jute Mill and Juddha Match Factory at Birgunj continued operating successfully. Most of other modern industries either closed down or declined (Agrawal, 2002:85-86).

Even after the change from the democratic move of 2007 B. S., enough attention was not given for industrial development it. National planning was launched in the year 2013 B. S. During first plan period, there were no achievement more than 24 rice and Oil mills. Slowly the industries flourished as Timber Corporation and Nepal Industrial Development Corporation was established. Two industrial estates Balaju and Patan were set-up during second plan period with foreign assistance, Janakpur cigarette Industry Brjung Sugar Mill and Bansbari Leather and Shoe Industry were established in public ownership. Birjung Agro Wools Industry and Harishiddhi Itta and Tile Industry were established. During the third plan, Hetauda Cotton Industry started manufacturing during fifth plan (Hiranya Lal, 2057:65-66).

Until 2001/02 A. D. 3213 manufacturing industries are established. Total number of persons engaged and employees in the industrial sector are 191,853 and 181,943

respectively. Contribution of industrial manufacturing sector in GDP is 8% (Statistical year book, 2007:296).

Mainly division of manufacturing industrial sector is as follows:

- a. Food, Beverage and Tobacco
- b. Textile and Garment
- c. Chemical and Pharmaceuticals
- d. Technical and Engineering
- e. Electrical and Electronics.

Business firms in Nepal are said to be losing their competitiveness due to higher costs. As Nepal entered in WTO, SAFTA, BIMIST-EC, Nepalese market is going to be liberal. Due to this, Nepalese product is competing with the product of other countries made by highly sophisticated technology with lower price. Therefore, it has been necessary for Nepalese manufacturing enterprises to make policy, strategy, plan, techniques and tools for cost reduction.

The general meaning of cost reduction is to reduce costs or expenses. Cost reduction is also called cost management consists of those action that are taken by managers to reduce costs.

According to IMA (London) "Cost reduction is the real and permanent reduction in unit cost of goods manufactured or service rendered with impairing their suitability of use intended" so the aspects of the cost reduction should be

- Real

- Permanent
- Moreover, no impair in suitability for use intended.

Swaminathan says, whilst cost control aims at reducing the actual to the targets; cost reduction aims at reducing the targets themselves. Viewed from this point, it can be said that cost reduction begins where cost control ends (Swaminathan, 1978:349).

Cost reduction in other words is also called cost management. Thus, the tools applied for cost management purpose are the tools used for cost reduction. The tools applied by successful Japanese manufacturing companies for cost reduction purpose are JIT system, Total Quality Management, Target Costing, Activity Based Management/ costing, Value Analysis, Life Cycle Costing, KAIZAN Costing, Mechanization and Automation, Training schemes, Standardization, Simplification and specialization.

1.2 Statement of the Problem

Nepal has more resources but due to lack of capital, equipment and Knowledge, Nepalese manufacturing industries are facing with more costs to acquire resources technologies and management. Firms established here have to bear higher costs to acquire resources. Due to the lack of proper knowledge regarding other ways of managing cost reduction, the struggle to reduce cost has gone in vain. Management here should know that using many tools other than directly bargaining for costs with the suppliers can reduce costs of goods and service lacking well educated manpower and experienced management are the problem every business firms are facing these days.

Wastages and leakages are the main problems faced by Nepalese manufacturing organizations. Almost in all organizations wastages are found in manufacturing process.

So, with the help of proper tool if wastages are controlled, it will automatically reduce costs. Proper rules for leakages can reduce cost in manufacturing process.

Therefore, this study will try to figure out the problem faced by Nepalese manufacturing industries by deriving the answers of the following questions.

1. Whether the cost reduction tools have been used in Nepalese manufacturing industries or not?
2. Are there any practical difficulties for applying cost reduction tools?
3. Are there any sectors of Nepalese manufacturing industries applying cost reduction tools or not?

1.3 Objectives of the Study

The main objectives of the study are "To examine application of cost reduction tools in Nepalese manufacturing enterprises." Other specific objectives are as follows:

- i. To examine the status of the application of cost reduction tools in Nepalese manufacturing enterprises.
- ii. To examine the practical difficulties of applying cost reduction tools in Nepalese manufacturing enterprises.

1.4 Focus of the Study

In the environment of free Industrialization, free flow of goods and services, and unhealthy competition, to make a sustainable profit, industries must have to cut down their products costs through cost reduction practice. Many tools have been used in Europe, America, England, Japan, China, India, and so many countries to reduce cost.

Some Nepalese manufacturing enterprises are also using cost reduction tools. However, many firms are not being able to bring the practice due to lack of proper knowledge about those tools. Therefore, this study focuses over the available literature regarding the cost reduction tools and present analysis of the status of their application in Nepalese manufacturing sector.

1.5 Limitations of the Study

Limitations exist everywhere and this study is not an exception of it. Research works by nature are based on hypothesis and assumption. Therefore, the limitations of this study are as follows.

1. This study will be made only upon the some manufacturing enterprises having head office within Kathmandu Valley.
2. The analysis will be mostly based upon primary data provided by respondents. Therefore, reliability of the conclusion will be highly depending up on respondents.
3. The status of the application of cost reduction tools analyzed in this research work will be based on data collected available.

1.6 Organization of the Study

Chapter - I: Introduction

The first chapter "Introduction" deals following topics:

- General Background: This unit mainly deals with the background of the study. It focuses on definitions/ introduction as well as concept of the study.

- Statement of the Problem: The problem of the study is mentioned in this unit. The problem facing by the Nepalese manufacturing enterprises is stated in this unit.
- Objective of the Study: The objective of the study is discussed in this unit. The difficulties of the study are identified here. The major tools are applied to eliminate the difficulties.
- Focus of the Study: The study is focused on the easy method of analyzing the tools and techniques. Practical work and available data for research is mainly focused in this unit.
- Limitation of the Study: Limitation is used everywhere for the research. So, the limited analysis/available data in limited time is included in this unit.
- Organization of the Study: The whole structure is mentioned in this unit. The framework of the research is presented here.

Chapter -II: Literature Review

The second chapter "Literature Review" deals with the review of related literature and available studies written and conducted by different experts and researchers in the field of Cost Reduction Technique and Tools.

Chapter - III: Research Methodology

This unit present methodology and plan here in the study consists of following subjects

1. Research Design
2. Sources of Data
3. Population of sampling

4. Data Collocation Procedures
5. Data Analysis Procedures
6. Tools to be used
7. Research variables

Chapter – IV: Presentation and Analysis of Data

This chapter will fulfill the objective of the study by presenting the data and analyzing them with the help of various statistical tools followed by methodology

Chapter - V: Summary, Conclusion and Recommendations

This chapter will summarize the whole study and it will draw conclusion and forward the recommendation for the application and improvements of cost reduction Techniques and Tools.

CHAPTER- II

REVIEW OF LITERATURE

2.1 Cost

2.1.1 Concept of Cost

In general, cost refers to expenditure. The cost is defined by academicians, accountants, economists and financial analysts in their own ways. From an accounting point of view, cost is the amount of resource given up in exchange for some goods or services. In broad sense, cost may be defined as the sacrifice of resources for a particular purpose. Cost is frequently measured by monetary units that must be paid for goods and services. The dictionary meaning of cost is the price paid to acquire product. In Nepal Brikshabdhakosh, published by Royal Nepal Academy, the meaning of cost is given as “an amount of expenses needed to produce or purchase a commodity”.

Like wise the meaning of cost is given in Webster New World Dictionary as:

- The amount of money or the like asked or paid for a thing.
- The amount spent in producing or manufacturing commodity.
- The amount paid for something by a dealer, contractor etc.
- The amount of money, time, effort etc requires achieving an end.

W.H. Harper defines “A cost is the value of economic resources used as a result of producing or doing the thing costed”. The Institute of Cost Accountants of England defines, “cost is the amount of (actual or notional) incurred on or attributable to a given thing”.

Committee on cost concepts and standards of American Accounting Associates defines “cost is a foregoing measured in monetary terms incurred or potentially incurred to achieve a specific objective”.

In other words of Anthony and Weisch “Cost is a measurement in monetary terms of the amount of service”.

According to Shilling law “Cost is the amount of resources given up in exchange for some goods or services”.

From the above definitions, it can be summarized that cost is the price paid for producing the goods or obtaining the services measured in terms of monetary value (Dangol, 2064:18).

2.1.2 Types of Costs

Costs have been classified in different ways in accordance with their common characteristics. The basis of classification may be time, element, and traceability to the product, change in activity or volume, functions, control, association with product, financial statement, managerial decision, cost reduction etc (Dongol, 2064:19).

The main focus of this study was to set up the types of costs from the view point of cost reduction. From the view point of cost reduction, costs are divided into two types. They are:

A. Value-Added Costs

B. Non-Value-Added-Costs

2.1.2. A) Value-Added-Costs

The cost of value added activity is called value added costs. 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 a value added activity in an organization that manufactures car (Drury, 2000:8-9).

2.1.2. B) Non-Value-Added Costs

Non value activities are operations that are either 1) unnecessary and dispensable or 2) necessary but inefficient and immoral. Non-value added costs which result from such activities, are the costs of activities that can be eliminated without deterioration of product quality, performance or perceived value (Hilton, 1997:261-262).

The costs of non-value activity are called non value added cost. Non- value-added activities reflect things that the organization does because of poor planning rather than what is inherently required to make the product. Moving, storing and inspecting are all activates that cause delay or waste in the manufacturing process while consuming resources. A product or process design that eliminated the need for non value activates will reduce costs and cycle time and often will increase product quality (Kaplan & Atkinson, 1998:229-230).

2.2 Cost Reduction

2.2.1 Concept of Cost Reduction

Cost reduction is the real and permanent reduction in the unit cost of goods manufactured or service rendered without impairing their suitability for the use of intended. Cost

reduction is also called cost management. Cost management consists of those actions that are taken by managers to reduce costs, 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 an opportunity has been identified to perform processes more effectively & efficiently and which have obvious cost reduction outcomes. It is important that accountants are aware of all the approaches that can be used to reduce costs even if there methods do not rely on accounting information. You should also note that although cost management seeks reduce costs it should not be at the expenses of customer satisfaction. Ideally, the aim is to take actions that will both reduce costs & enhance customer satisfaction (Drury, 2000:389).

The general meaning of cost reduction is to reduce cost or expenses. According to IMA (London) “Cost reduction is the real and permanent reduction in the unit cost of goods manufactured or service rendered with out impairing their suitability for the use of intended”. So the feature of the cost reduction should be:

1. Real
2. Permanent
3. Add no impair in suitability for the use. Intended (means no impair in quality)

To remain in competition in today’s global market, every business must continually improve. Moreover, this continuous improvement needs to apply across the spectrum of business activity from product design & quality through production operation & cost management to customer service. Continuous improvement may be defined as the

constant effort to eliminate the waste, reduce response time, simplify the design of both products and processes and improve quality & customer service. One compelling reason for the need for continual improvement is the price down/cost down concept. There refers to the tendency of price to fall over the life cycle of a newly introduced product (Hilton, 1997:264).

Swaminath says: “Whilst cost control aims at reducing the actual to the targets, cost reduction aims at reducing the targets themselves. Viewed from this point, it can be said that cost reduction begins where cost control ends” (Swaminath, 1978:349).

2.2.2 Cost Reduction vs. Cost Control

Generally cost reduction & cost control are used in the same sense. However, there is a wide difference between these two words. As said by Swaminath in his ‘Lectures in costing’ cost reduction starts where costs control ends. Cost control refers to making actual equal to standards or targets where as, cost reduction reduces the targets themselves. The following are the major differences between them:

- 1. Process:** - In cost control, the actual costs are compared with standard costs and the reasons for deviations are analyzed and control is exercised. However, in cost reduction the targets are reduced themselves.
- 2. Basis of Time:** - Cost control is related to past & present, where as cost reduction related to present & future.
- 3. Conservative Concepts:** - The standards are not changed in cost control. They are used to analyze deviation from actual figures. However in cost reduction no deviation is computed but the standards are changed.

4. **Limit:** - Control requires standards cost. But, cost reduction can be freely exercised in all areas without use of standards.
5. **Target:** - Cost is controlled earlier, where as, cost reduction is done later.
6. **Function:** - Cost control is a preventive in nature but cost reduction is corrective in nature.

2.2.3 Organization of Cost Reduction

Cost Reduction cannot be attained in isolation by one's endeavor. It requires mass participation, wide communication and effective training within the organization and between the departments. Management tools like leadership, motivation etc. should be used.

For an organization for cost reduction, a cost reduction committee is made comprising heads of purchase, planning, and production, sales, distribution, and research departments. The committee is empowered for necessary planning and implementations decision for cost reduction. The committee finds out the areas where cost reduction can be exercised and make work priorities for accomplishment. From such priority list, planning and programs are made respectively. Small firms operate cost reduction and cost reduction activities through cost account departments.

2.2.4 Scope of Cost Reduction

As mentioned earlier, cost reduction committee identifies areas where the reduction activities can be best exercised. Generally cost reduction works are made in the following areas.

i. Product Design

Before producing goods, product designs are made. Such design covers all activities required for production. If care is taken from the initial phase, cost of materials, labor, supporting activities and tools can be reduced. However, such exercise should not devalue the use value and aesthetic value of the products.

ii. Organization

The organizational work system of industrial firm can be a possible cost reduction area. However, the reduction can not be measured and can only be realized through clear stating of duties and responsibilities, proper work division and clear accountability, coordination among all departments and all levels, good communication, motivation, delegation of authority, proper conflict management, good leadership and staffing all can help to reduce cost.

iii. Production Planning & Control

Cost Reduction can be exercised over the production area. A good production process should be developed; a low investment in raw materials, reduction in failure times, good inventory management and control of both materials and finished goods, control of abnormal loss, spoilage defects and scrap etc. are other cost reduction exercises.

iv. Equipment and plant layout

The layout of plant and equipment should be so designed to produce maximum flow, quick processing and saving of time. This will facilitate less spoilage and loss.

v. Administration

Administrative activities like performance appraisal, supervision, good filing, simplification of work, economy in printing, mailing and telephone expenses, and internal communication should be well managed to reduce costs.

vi. Selling and Distribution

The expenses, incurred for salesmen, packaging, promotion and distribution of goods and services can be reduced.

vii. Finance

Collection of fund with low interests, investment in highest profitable option, under/ over capitalization and control of unnecessary investment are control exercises in finance sector.

viii. Purchasing and Controlling Materials

Control of unnecessary purchase, purchase at low cost, good recording of purchases and inventories, control in collection, issue and loss of materials can also reduce cost.

2.2.5 Tools and Techniques of Reduction

Cost reduction, in other words is also called cost management. Thus, the tools applied for cost management purpose are the tools used for cost reduction. Cost management is the most favored word generally used instead of cost reduction. The tools applied by successfully Japanese manufacturing companies for cost reduction purpose are as follows:

- i. JIT System
- ii. Total Quality Management
- iii. Activity Based Management
- iv. Value Analysis
- v. Training Schemes
- vi. Standardization, Simplification and Specialization.

2.3 JIT System

2.3.1 Concept

Just in time is a significant approach of production management after post world war second. After the end of 2nd world war, Japan went through a period of high shortage of resources. The country had a challenge to lift up its economic status in the world map again, regardless of the face it was bearing after several American attacks during world war 2nd. Before the war, there was traditional approach to production and productivity. As per that approach, productivity depends up on levels of input consumption. Higher the cost of input, lower the productivity. So, to increase productivity one should go for lower level of input consumption. Cost reduction in this way, however, is not possible and Japanese people were well aware of it. So, they did not give much value to traditional approach and used their own presumption over the productivity which was called later “Japanese Approach”. Just in time gained world prominence in 1970s. But, Henry Ford used some of the philosophy of the JIT in United States in early 1900s. Similarly, some elements of JIT were also used in Japanese industries as early as 1930s. Tai-ichi ohno of Toyota motors used JIT to take Toyota’s cars to forefront of delivery time and of quality.

At the same time, Deming and Juran lectured on the need for American producers to adopt JIT principles.

But after, the success of Japanese firms in international markets generated interest among many western companies as to how this success was achieved. The implementation of just in time (JIT) production was considered to be one of the major factors contributing to this success. The JIT approach involves a continuous commitment to the pursuit of excellence in all phases of manufacturing systems design & operations. The aims of JIT are to produce the required items at the required quality and in the required quantities at the precise time they are required (Drury, 2000:908).

A JIT inventory & production management system is a comprehensive inventory & manufacturing control system in which no materials are purchased and no products are manufactured until they are needed. Raw materials and parts are purchased only as they are needed in some phase of the production process. Components, parts & subassemblies are not manufactured in any stage of production until they are required in the next stage. Finished goods are manufactured only as they are needed to fill customer orders. Primary goals of a JIT production system are to reduce or eliminate inventories at every stage of production from raw materials to finished goods (Hilton, 1997:250).

JIT means producing what is needed, when needed and no more. Anything over the minimum amount necessary is viewed as waste, because effort and material expended for something not needed now, cannot be utilized now. This is in contrast to relying on extra

materials just in case something goes wrong. JIT can be summarized as presented by Chase, Aquiline and Jacobs in “what’s of JIT”. This shows the requirements of and the assumptions of the JIT system.

What it is	What it does
Management philosophies “pull” system through the plant.	1. Attacks waste (overproduction, waiting, transpiration, processing it self, stocks, motion and making detective) 2. Exposes problem and bottlenecks. 3. Achieves stream lined production.
What it requires	What it assumes
1. Employee participation. 2. Industrial engineering. 3. Continuing improvement. 4. Total quality control. 5. Small lot sizes.	Stable environment

(Chase & Jacobs, 1999:327)

2.3.2 General features of JIT system

Production and operation management experts have shown the following features of JIT system to explain how it achieves its vast reductions in inventory and associated cost saving. These features are:-

1. A Smooth, Uniform Production Rate

JIT system requires a uniform rate of production, rather than one, fluctuating more. Fluctuation in production rate may excessive production at the time of less need or shortage of outputs at the time of high need, both of which creates non-value added costs.

2. A pull method of co-coordinating steps in the Production Process

Manufacturing processes occur in many stages. In a JIT system, the production is pulled from the following stage where as the first strike is at the marketing department. The marketing or sales department informs to the production department how much products are required. In a production department, there will be many work centers depending upon the nature of the production work. The last work center of producing department receives the first message how much goods are needed. It then decides how much components are to be supplied to it from the former work center to meet its production needs and informs the same. The message is in the form of withdrawal Kanban, which is card indicating how much parts are requested from the preceding work center. When the former work center receives the withdrawal Kanban, it issues production Kanban, which specifies how many part to manufacture. So the work of production at a center is pulled by needs for parts in subsequent work center. This pull approach repeats from the last to the beginning. Manufacturing at any stage is pulled due to need at the former stage. Therefore, stocks do not accumulate. Thus, this approach reduces or eliminates work in process inventory between production steps. The result is a reduction in waiting time and its associated non value added cost.

3. Purchase of Materials and Manufacture of Subassemblies and Products in Small Lot Sizes

This is an outgrowth of pull method of production planning. Materials are purchased & goods are produced only as required rather than for the sake of building of stock. The result is a reduction in storage and waiting time and related non-value added cost.

4. Quick and inexpensive set up of Production Machinery

In order to produce in small lot sizes, a manufacturer must be able to set up production runs quickly. Advanced manufacturing technology aids in this process as more and more machines are computer controlled.

5. High quality levels for Raw Materials & Finished Products

If raw materials and parts are to arrive 'JIT' for production they must be just right for their intended purpose. Otherwise, the production line will be shut down and significant non value added cost of waiting will result. More over, if very small stocks of finished goods are to be maintained, then finished products must be of uniform high quality for this reason a total quality control (TQC) program often accompanies a just in time production environment.

6. Effective Preventive Maintenance and Equipment

If goods are to be manufactured just in time to meet customer orders a manufacturer can not afford significant production delays. By strictly adhering a routine maintenance schedules, the firm can not avoid costly down time from machine breakdowns.

7. At atmosphere of team work to improve the Production System

All the employees of an organization need to consider and contribute the achievement of JIT goals. A team spirit must be taken and valuable suggestions should be provided by all the employees. JIT goals should be goals of every one.

8. Multi- skilled Workers & Flexible Facilities

JIT goals can be attained if the workers have multi skills and highly efficient. Similarly, the facilities chosen and layout should be well designed to make quick production and easy flow of outputs avoiding waiting time and reducing there on non value added costs.

2.3.3 Goals of JIT System

The JIT approach involves a continuous commitment to the pursuit of excellence in all phases of manufacturing systems design and operations. The aims of JIT are to produce the required items, at the required quality and in the required quantities, at the precise time they are required. In particular, JIT seeks to achieve the following goals:-

-) Elimination of non value added activities
-) Zero inventory
-) Zero defects
-) Batch size of one
-) A 100%on time delivery service

The above goals represent perfection, and are most unlikely to be achieved in practice. They do, however, offer targets and create a climate for continuous improvements and excellence (Drury, 2000:908).

2.3.4 Types of JIT System

The JIT system can be studied in the two forms:

1. JIT Production/Manufacturing system
2. JIT Purchasing/Inventory

JIT Production/Manufacturing

JIT Manufacturing includes a total quality which increases the value customers receive. JIT includes people involvement which gains the advantage & talents of many employees to reduce waste & improve performance. The improved motivation and the power of numerous employee suggestions can reduce costs and improved quality and responsiveness. Reduced WIP can improve quality, reduce costs, cut the lead time to serve customers, and make the company more flexible. JIT also involves preventive maintenance which can improve the dependability of operation (Dilworth, 1993:343).

JIT Purchasing/Inventory

The JIT philosophy also extends to adopting JIT purchasing techniques, where by the delivery of materials immediately precedes their use. By arranging with suppliers for more frequent deliveries, stocks can be cut to a minimum. Considerable saving in material handling expenses can not be obtained by requiring suppliers to inspect materials before their delivery and guaranteeing their quality (Drury, 2000:911).

The characteristics of Japanese JIT purchasing are unique, in terms of both general philosophy and in detailed procedures. The term JIT purchasing suggests an emphasis on timing, which is true, but it does not suggest the board philosophical underpinnings of the system. Although the term comes from the emphasis on supplying materials just in time for use on the factory floor, equally important are the close relationships with a few long term suppliers (approaching sole source in the deal), geographically close suppliers, loose specification and contracts, and frequent deliveries of small, exact quantities (Buffa, 2000:445).

There are many benefits from JIT purchasing system. Inventories are greatly reduced in the buyer's plant since it is working off the supplier's inventory. Even the supplier's inventory is smaller because of the nearby continuous supply rate. There is a great deal less paperwork in the system because of the blanket contracts and simple specifications. As a result of an assured steady flow, suppliers can minimize peak capacity requirements and retained labor force (Dilworth, 1993:447).

2.3.5 Wastes in JIT System

Waste means anything other than minimum amount of equipment, materials, parts & workers which absolutely essential to production. Shigeo Shigeo, a recognized JIT authority & Toyota Motor Company identifies seven wastes as being continuous improvement in production processes. They are as follows:

-) Waste of overproduction
-) Waste of waiting
-) Waste of transportation
-) Waste of processing itself
-) Waste of stocks
-) Waste of motion
-) Waste of making defective

(Regmi et. al; 2006:188)

2.3.6 Failure in application of JIT System

As described above, JIT system can be implemented either by accepting JIT production or JIT purchasing or both. JIT system in production means no warehousing of work-in-

process and finished goods, and JIT purchase means no raw materials or parts storage. JIT helps reduce holding cost, which adds zero value against cost. Successful implementation of the system helps reduce the cost of sales, and consequently the market price of goods. This helps niche competitive advantage in the market.

However, the system can not be easily accepted and implemented. There are certain prerequisites for this, which need to be fulfilled. The first and foremost thing for the implementation of JIT system is the knowledge and education, experience and expertise in it. Unless the JIT planning team has secured higher education or gained full knowledge about JIT, it can not be successfully implemented in the system. Similarly, for the JIT implementation, the suppliers of raw materials/parts should be found in abundance in the market, and even those found should also be having higher capability to supply the demanded materials/parts as soon as they receive the orders. Side by side, relationship with the suppliers should be strengthened so that in the period of storage, those suppliers shall give first priority. A continuous reporting agent should be hired to report on suppliers' availability and strengths that will help to take timely decisions on suppliers' selection.

2.4 Total Quality Management (TQM)

2.4.1 Concept

To compete successfully in today's global competitive environment, every company is becoming 'customer-driven' and making customer satisfaction. The customers are demanding ever-improved levels of service regarding cost, quality, reliability, delivery, and the choice of innovative new products. Quality has become one of the key

competitive variables and this has created the need for management accounts to more involve in the provision of information relating to the quality of products and services and activities that produce them. In U.K, quality related costs have been reported to range from 5% to 15% of total company sales revenue. Eliminating inferior quality can therefore result in substantial savings and higher revenues (Drury, 2000:901).

Armand Feigenbaum, a noted authority on subject, defines quality as “the total composite product and service characteristics of marketing, engineering, manufacturing and maintenance through which the product or service in use will meet the expectations of customer” (Feigenbaum, 1983:7).

Quality requires a composite of attributes to satisfy a range of expectations of numerous customers of potential customers. Quality often means different things to different people. A person may evaluate at least eight aspects of product or service to see if it satisfies his/her needs i.e.

- i. Performance
- ii. Features
- iii. Reliability
- iv. Serviceability
- v. Durability
- vi. Conformance
- vii. Aesthetic characteristic (looks, feels, or smells) and
- viii. Perceived quality

(Dilworth, 1993:467)

The term Total quality management (TQM) has been coined to describe a philosophy that makes quality values the driving force behind leadership, design, planning and improvement initiatives. The main reason is that quality is essential for long term financial success. Total quality management is managing the entire organization so that it excels on all dimensions of products and services that are important to the customers rather than conformation to specification (Regmi, et.al.; 2006:192).

TQM is concerned with the integration of all the efforts in the organization towards quality improvement, quality development and quality maintenance to meet the full customer satisfaction at an economical way. Simply speaking, TQM means activities involving every one in a company towards improving performance at every level and it focus on the betterment of organization by enhancing customer satisfaction and continual improvement (Sthapit, 2006:167).

The overview of the TQM is shown below:

Philosophical Elements	General tools	Tools for QC departments
➤ Customer driven quality ➤ Leadership ➤ Continuous improvement ➤ Employees participation and development ➤ Quick response ➤ Design quality a prevention - etc.	➤ Statistical process control) Process flow charts) Check sheets) Pareto analysis and histogram) Cause & effect diagrams) Scatter diagram) Control charts ➤ Quality function deployment.	➤ SQC methods) Sampling plans) Process capability) Taguchi methods.

The elements of TQM stress operations of the firm use quality as the integrating elements.

The generic tools consist of various statistical process control methods that are used for problem solving & continuous improvement of quality teams. Quality deployment function is typically used by managers to drive the voice of customers in to the organization.

Tools for quality department: they consist of statistical quality control methods that are used by the quality professionals working in the department (Regmi, et.al; 2006:193).

2.4.2 Management of Product Quality

Manufacturers today have been high alert concerning the quality and the products. They have come across the use of many managerial and statistical techniques to control the quality. Control of quality leads to cost reduction. Outputs manufactured do not lose their markets & they eliminate the costs of sales returns from customers due to inferior quality. Whenever, quality of products is concerned, any or all of the following types & quality should be focused.

-) Quality of materials
-) Quality of manpower
-) Quality of machines
-) Quality of management

They are also known as 4MS. Quality of materials must be controlled. Materials are important component since our customers are served with processed materials. Lower the

quality of materials, lower will be the quality of outputs manufactured and there is equally likely to get those products returning back due to rejection from the customers. Loyal customers may also defect from the business firms. The costs for all these things are very high. Controlling the quality of materials before this tragedy materialize saves the costs of customer defection & sales returns.

Similarly, the quality of manpower should also be controlled. This refers to the education, expertise, experience and commitment of employees/workers and managerial people. The technologies used should also uplift the quality of products. Machines should represent latest technology and failure or breakdowns should be avoided. Never the least, the management of organization should also be highly qualified, hardworking, educated, experienced and should possess' potentiality to lead the organization.

There are a number of statistical methods for checking the goods reaching the final customers with defects in them. In traditional statistical quality control, each and every item should be inspected to stop defective flow. However, each and every item can not be looked upon and tested. So, sampling technique is followed. Manufactures have to bring all the outputs under inspection and control to sensor possible defectiveness. However, in sampling method, only limited number of samples out of the total population quantity is studied. So, the samples drawn may not be representative to the whole population. The reasons for such variations are as follows:-

-) Variation due to chance factors.
-) Variation due to assignable causes.

When the random sampling is followed, drawn samples may not be representative. Non-representative sample may be drawn due to chance.

Similarly, inefficient workers, disordered machines and disturbing layout, defective materials etc. may assign defection to the later stage of production.

2.4.3 Principles of TQM

To lead and operate an organization successfully, it is necessary to direct and control it in a systematic and transparent manner. Success can result from implementing and maintaining a management system that is designed to continually improve performance while addressing the needs of all interested parties. Managing an organization encompasses TQM amongst other management disciplines. Eight TQM principles have been stated in ISO 9001:2000 that can be used by top management in order to lead the organization towards improved performance.

) **Customer Focus:** - Organization depends on their customer and therefore, should understand current and future customer needs should meet customer requirement and strive to exceed customer expectations.

) **Leadership:** - Leader establishes unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organizations objectives.

) **Involvement of People:** - TQM seeks involvement of every body of all levels to achieve the organizations objective. Involvement enables to explore every body's abilities.

) **Process Approach:** - It focuses on carrying out activities and management of resources. A good and desired result is achieved when activity and related resources are managed as a process.

) **System Approach:** - Identifying, understanding & managing interrelated process as a system contributes to the organizations effectiveness & efficiency in achieving its objectives.

) **Continual Improvement:**-Continual improvement of organization overall performance should be permanent objective of the organization.

) **Factual Approach to Decision Making:** - Effective decisions are based on the analysis of a data & information.

) **Mutually Beneficial Supplied Relationship:** - An organization & suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value (Sthapit, et.al.; 2006:170) .

2.4.4 Approaches to Quality Management

Quality can be controlled applying many techniques. Specially, there are three techniques to apply for quality control. Firstly, the product characteristics should be improved. Secondly, the management should determine the level of qualities of the products during the planning and design phase. Thirdly, the process capability should be updated.

Along with techniques to control the quality, there are many other approaches equally accepted. They are: -

1. Deming's Statistical Thinking

As per Deming's view over quality, it is the job of management to control quality.

Deming suggests managers to use control charts to evaluate variability.

2. Juran's Management Processes Through Quality

As per Juran's view, every one should regularly take the concern for quality. Quality control should be a regular and continuous process.

3. Crosby's Concept of Free Quality

Crosby views that quality is a gift to process from its former process stage. It moves freely from one stage to next. Finished goods produced inherit special quality from raw materials. Unless the quality of raw material is controlled, quality of finished goods can not be controlled. So purchase of raw materials should be rationally done with committed participation from the workers.

In Japanese manufacturing organizations, workers willingly from their work group to work over quality problems. Three to fifteen employees meet to discuss over quality problems, investigate causes, recommend solutions and take corrective action, such work groups are known as quality circles (QC). Workers participating in quality circles get chance to show out their potential.

Similarly, Zero defects programs are also equally applied in today's Japanese manufacturing organizations. The core philosophy of Japanese Zero defect program is that quality of products should be improved before reaching to customers, so that goods

reaching to customers are zero defects. Defects in the quality of products occur due to either lack of knowledge or lack of attention. Lack of knowledge can be eliminated by imparting knowledge. However, in case of lack of attention, employees and workers must themselves be willing to participate in the program. For this, they need to be motivated with many motivational tools like promotion, bonus, salary increment, status enhancement etc. Unless employees are made more responsible, achievement oriented and proud of their works, Zero defects programs cannot be successful.

Besides using non financial measures statistical quality control chart are used as a mechanism for distinguishing between random and non-random variations in operating processes. A control chart is a graph of a series of successive observations of operations taken at regular intervals of time to test whether a batch of produced items is within pre-set tolerance limits. Usually, samples from a particular production process are taken at hourly or daily intervals. The mean and sometimes the range of the sampled items are calculated and plotted relative to pre-set points on the expected distribution. Only observations beyond specified pre-set control limits are regarded as worthy of investigation.

2.4.5 Cost of Quality

TQM, a term used to describe a situation where all business functions are involved in a process of continuous improvement has been adopted by many companies. TQM has broadened, from its early concentration on the statistical monitoring of manufacturing process to a customer-oriented process of continuous improvement that focuses on delivering products or services of consistent high quality in a timely fashion. In the 1980s

most European and American companies considered quality to be additional cost of manufacturing, but by the end of the decade, they began to realize that quality saved money. The philosophy of emphasizing production volume over quality resulted in high levels of stocks at each production stage in order to protect against shortages caused by inferior quality at previous stages and excessive expenditure on inspection, rework, scrap and warranty repairs. Companies discovered that it was cheaper to produce the items correctly the first time rather than wasting resources 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 in rather than trying to inspect it in, by focusing on the causes rather than the symptoms of poor quality.

Management accounting systems can help organizations to achieve their quality goals by providing a variety of reports and measures that motivate and evaluate managerial efforts to improve quality. These will include financial and non-financial measures. Many companies are currently not aware of how much they are spending on quality. A cost of quality report should be prepared to indicate the total cost to the organization of producing products or services that do not conform to quality requirements. Four categories of cost should be reported.

1. Prevention Costs: - Prevention costs are the costs incurred in preventing the production of products that do not confirm to specification. They include the costs of prevention maintenance, quality planning and training and the extra costs of acquiring higher quality raw materials.

2. Appraisal Costs: - Appraisal costs are the costs incurred to ensure that materials and products meet quality conformance standards. They induce the costs of inspecting purchased parts, work in process and finished goods, quality audits and field tests.

3. Internal Failure Costs: - Internal failure costs are the costs associated with materials and products that fail to meet quality standards. They include costs incurred before the product is dispatched to the customer such as the cost of scrap, repair, down time and work stoppages caused by defects.

4. External Failure Costs: - External failure costs incurred when inferior products are delivered to customers. They include the costs of handling customer complaints, warranty, replacement, repairs of returned products and the costs arising from damaged reputation (Drury, 2000:902).

The cost of quality report can be used as an attention-directing device to make the top management of a company aware of how much is being spent on quality related costs. The report can also draw management's attention to the possibility of reducing total quality costs by wiser allocation of costs among the four quality categories. For example, by spending more on the prevention costs, the amount of spending in the internal and external failure categories can be substantially reduced and therefore total spending can be lowered. Also, by designing quality in to products and processes appraisal costs can be reduced, since far less inspection is required.

Prevention and appraisal costs are sometime referred to as the cost of quality conformance or compliance and internal and external failure costs are known as the costs of non-conformance. Costs of compliance are incurred with the intention of eliminating

the cost of failure. They are discretionary in the sense that they do not have to be incurred where as costs of non-compliance are the results of production imperfections and can only be reduced by increasing compliance expenditure.

2.4.6 Continuous Quality Management

As per W. Edwards Deming, the failure to achieve quality in U.S can be blamed 80% on system, which can be changed by management and 20% on the workers. So, Deming believes management can play key role in quality management. The winner of Japanese National Prize 1989, Wayne Brunetti has mentioned four major barriers for implementations of quality program. They are top management, middle management, first line supervision and technical staff who think they are the only experts and have all the relevant knowledge. Management must take pride in its work as well as must also do its part and see that other requirements are met. Management has delegated some authority to the workers to improve quality and stop failing process. The common factors considered for managing continual quality management are as following:-

1. Management commitment
2. Customer focus
3. Effective organization and co-ordination
4. Employee participation for quality improvement
5. Design for quality
6. Consistent on target performance
7. Data driven decisions
8. Monitor and control quality and improvement
9. Instill on going improvement

2.5 Activity Based Management

2.5.1 Concept

The term activity-based management (ABM) or activity-based cost management (ABCM) is used to describe the cost management application of ABC (Drury, 2000:897). This process is based on activity-based-costing which have been developed a more refined approach for assigning overheads to product and computing product cost by Cooper and Kaplan on 1988.

Activity-based management (ABM) uses an activity-based costing system to improve the operations an organization. Costs are incurred in organizations because of activities. A sale order triggers a series of activities from the purchase of materials, through various production phases, ending with shipping the product. A key feature of activity-based costing system is that they measure and track the costs of significant activities over time. In addition to using the activity cost information collected in an ABC system, activity-based management involves the collection of financial or operational performance information about significant activities in the enterprise. The motivation for this process is twofold. First, the costing system attempts to assign the costs of significant activities to the products that cause those costs to be incurred. Second, by identifying the cost of activities, managers can attempt the reduction or elimination of unnecessary costs. ABC and ABM tend to strike a familiar chord with a variety of managers and employees throughout an enterprise. Activities are expressed in terms of events that are familiar to such diverse people as sales personals, engineers, purchasing managers, inspectors, material handlers, production employees and shipping personnel.

ABM views the business as set linked activities that ultimately add value to the customer. It focuses on managing the business on the basis of the activities that make up the organization. ABM is based on the premise that activities consume costs. Therefore, by managing activities costs will be managed in the long term. The goal of ABM is to enable customer needs to be satisfied while making fewer demands on organizational resources (Drury, 2000:897).

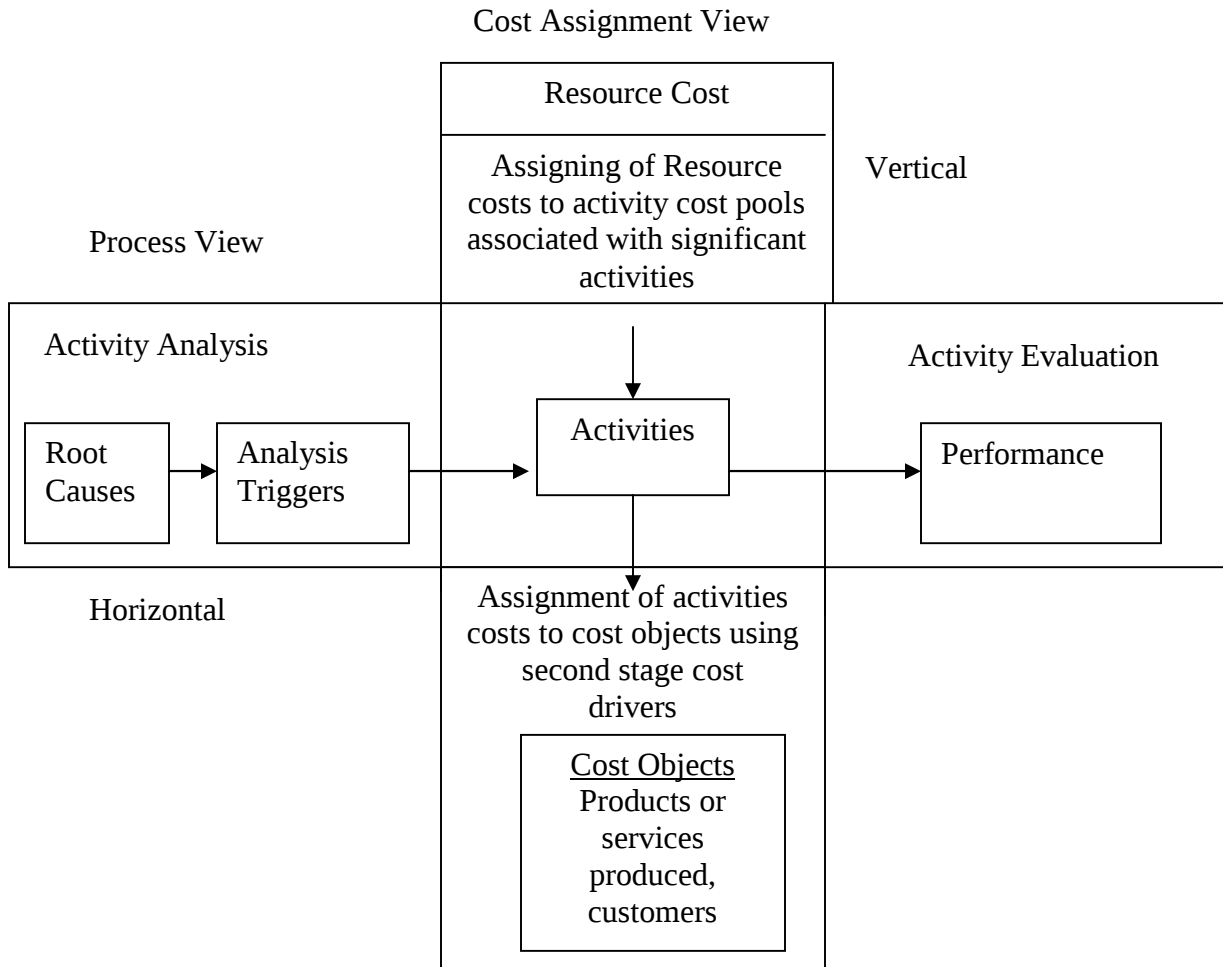
2.5.2 Activity-Based- Costing and Management in the Service Industry

Activity-based costing and activity based management are widely using in the service industry as well as in manufacturing. There have been many ABC success stories such diverse organizations as airlines, insurance companies, banks, hospitals, financial services firms, hotels and railroads. The overall objective of ABC and ABM in service is no different than they are in manufacturing companies. Managers want more accurate information about the cost of producing the service they are selling. Moreover, they want to use this information to improve operations and to better meet the needs of their customers in a more cost effective manner. The general approach of identifying activities, activity cost pools, and cost drivers may be used in the service industry as well as manufacturing. The classification of activities in to unit-level, batch-level, product-sustaining level, and facility-level activities also applies in service industry settings (Hilton, 1997:216).

2.5.3 Two Dimensional ABC Model

Using activity-based costing information to improve operations and eliminate non-value added costs is called activity-based management (ABM).

One way of picturing the relationship between ABC and ABM is in terms of the two dimensional activity-based costing model as presented by Ronald W. Hilton;



The vertical dimension of the model depicts the cost assignment view of an ABC system. From the cost assignment view point, the ABC system uses two stage cost allocation to assign the cost of resources to the firms cost objects. These cost objects could be products manufactured services produced or customers served.

The horizontal dimension of the model is the process view of an ABC system. The emphasis now is on the activities themselves, the various processes by which work is accomplished in the organization (Hilton, 1997:261).

In above figure, the left hand side depicts activity analysis, which is the detailed identification and description of the activities conducted in the enterprise. Activity analysis entails identification not only of the activities but also of their root causes, the events that trigger activities, and the linkages among activities. The right hand side of above figure depicts the evaluation of activities through performance measures. It is these processes of activity analysis and evaluation that comprise activity-based management. Notice that the activities, which appear in the center of both dimensions in above figure, are the focal point of ABC and ABM.

2.5.4 Process to eliminate Non-Value Added Costs by using ABM

An important goal of activity-based management is to identify and eliminate non-value-added activities and cost. Non-value-added activities are operations that are either a) unnecessary and dispensable or b) necessary but inefficient and improvable. Non-value-added costs, which result from such activities, are the costs of activities that can be eliminated without deterioration of product quality, performance or perceived value. The following steps provide a strategy for eliminating non-value costs in both manufacturing and service industry firms.

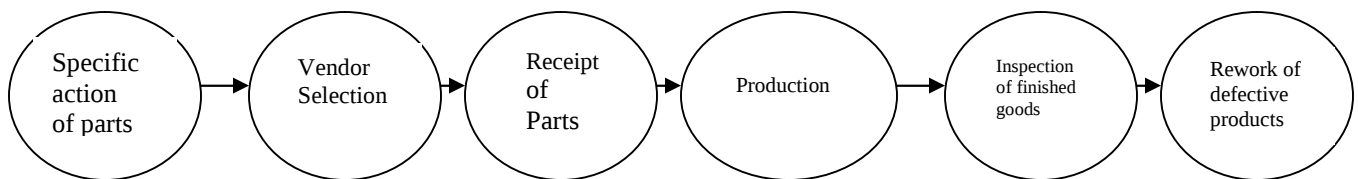
1. Identifying Activities: - the first step is activity analysis, which identifies all of the organizations significant activities. The resulting activity list should be broken down to the most fundamental level practical. For example, rather than listing purchasing as an activity , the list should break down the purchasing operation into its component

activities, such as obtaining part specifications, compiling vendor lists, vendor selection, negotiation, ordering and expediting.

2. Identifying Non-Value Added Activities:-Three criteria for determining whether an activity adds value are as follows:

- Is the activity necessary? If it's duplicate or nonessential, it is non-value added.
- Is the activity efficiently performed? In answering, it is helpful to compare the actual performance of the activity to a value-added baseline established using budgets, targets or external benchmarks.
- Is an activity sometimes non-value-added and sometimes value-added? For example, it may be necessary to move work-in-process units between production operations, but unnecessary to move raw materials around which in storage.

3. Understanding activity linkage, root causes and triggers: - In identifying non-value-added activities, it is critical to understand the ways in which activities are linked together. The following chain of activities provides an example:



The rework of defective units is a non-value-added activity. The rework is triggered by the identification of defective products during inspection. The root cause of the rework, however, could lie in any one of number of preceding activities. Perhaps the part specifications were in error or were an unreliable vendor selected? Were the wrong parts received? Or is the production activity to blame?

A set of linked activities (such as that depicted above) is called a process. Sometimes, activity analysis is referred to process value analyses (PVA).

4. Establishing Performance Measures: - By continually measuring the performance of all activities and comparing performance with benchmarks, management's attention may be directed to unnecessary or inefficient activities.

5. Reporting Non-Value-Added Costs: - Non-value-added costs should be highlighted in activity center cost reports. By identifying non-value-added activities and reporting their costs, management can strive toward the on going goals of process, improvement and elimination of non-value-added costs.

6. Achieving Cost Reduction: - Once non-value-added activities have been identified four techniques may be used to reduce the resulting non-value-added costs.

- Activity reduction: - This technique simply scales back the activity, by reducing the time or other resources devoted to it.
- Activity elimination: - This approach assumes the activity is utterly unnecessary.
- Activity selection: - Under this strategy, the most efficient activity is selected from a set of alternatives.
- Activity sharing: - This technique finds ways to get more mileage out of an existing activity by combining functions in a more efficient manner. An example is use of common parts in several related products, rather than designing each product to use unique parts.(Hilton,1997:263)

2.6 Training

2.6.1. Concept

Training is a learning experience in that it seeks a relatively permanent change in an individual that will improve his/her ability to perform on the job. We typically say, training can involve the changing of skills, knowledge, attitudes or social behavior. It may mean changing what employees know, how they work their attitudes toward their work or their interactions, with their co-workers or their supervisor.

The manpower services commission (1973) defines training as “a planned process to modify attitude, knowledge or skill behavior through learning experience to achieve affective performance in an activity or range of activities. Its purpose, in the work situation, i.e. to develop the abilities of the individual and to satisfy the current and future needs of the organization”.

Garry Dessler defines “Training refers to the methods used to give now or present employees the skills they need to perform their jobs”.

According to K.K. Ahuja, “Training is defined as an organization procedure for increasing the knowledge and skill of people for a definite purpose. The purpose of training is to achieve at change in the behavior of those being trained”.

Edwin B.Flippo defined “Training is the act of increasing the knowledge and skills in an employee for doing a particular job” (Agrawal, 2006:215).

From the above definition, it can be said that in the industrial situation training means that the trainees shall acquire new manipulation skills, technical knowledge and problem solving ability or attitudes. It is expected that the employees apply their newly an acquired knowledge and skills on the job in such a way as to aid in the achievement of organizational goals.

2.6.2. Distinction between Training and Development

Training and development are used in the same sense. But both are different in various aspects.

Training is short term process utilizing systematize and organized procedure by which non managerial personnel learn technical knowledge and skills for definite purpose. Development is a long term educational process utilizing a systematic and organized procedure by which managerial personnel learn conceptual & theoretical knowledge for general purpose.

Training refers only to instruction in technical and mechanical operations while development refers to philosophical and theoretical education concepts. Training is desired for non managers, while development managerial personnel.

2.6.3. Needs/Benefits of Training

Training is the corner stone of sound management. For it makes employees more effective and productive. It is actively and intimately connected with all the personnel or managerial activities. It is an integral part of whole management program, with all its

many activities functionally inter-related. Pointy the needs/benefits of training are as follows:

i. Improvement in Job, Knowledge, Skills and Attitudes: -It helps to increase the knowledge and skills of the employees for a particular job. Hence, it helps in increasing the productivity.

ii. Standardization: - It provides best procedure of performing the work. So, work can be standard which helps to minimize the errors of the employees.

iii. Attitude Formation: -It helps to bring positive attitude of employees through good morale reducing absenteeism. Due to job satisfaction, it can also help to reduce labor turnover.

iv. Less Cost: - Training helps to keep cost down through properly utilization of resources like men, materials, money etc. It also helps to reduce wastes & scrapes.

v. Supply of Man Power Needs: - It provides skillful, talent and capable manpower providing them required knowledge. So, needed manpower can be fulfilled from the organization.

vi. Reduction in Learning Time: -Training helps to reduce learning time to reach acceptable performance due to qualified instructors and carefully controlled learning situation.

vii. Other Benefits

- a. Improves labor-management relation.
- b. Aids in improving organizational communication.
- c. Helps in planning the change and managing conflicts.
- d. Improves organizational climate.
- e. It develops marketability of the employees.

2.6.4 Determining Training Needs

Training should be given when there is a training needed. A training need exists when a job performance problem can be traced to a knowledge or skill deficiency. This represents a gap between the existing capabilities of an employee and the requirements of the job (Agrawal, 2007: 225).



Training needs assessment is a systematic analysis of specific training activities required to achieve HRD goals.

Training needs determination is important because of following reasons

1. Develop Training Objectives- Properly assessed training needs are essential for developing training objectives such objectives should follow organizational & HRD objectives.
2. Identifying Training responding problems- All human resource problems do not respond to training solution. Training needs determination helps identify problems that respond to training intervention.
3. Develop Training programs- Training programs must be relevant to the needs of organization and employee. Training needs determination helps to develop appropriate training programs. It also facilitates selection of curriculum, training, methods, trainers and trainees.
4. Evaluate Training- Training needs determination is essential to evaluate the outputs of training. Follow-up of training activities can be based on feedback (Agrawal, 2007:225).

2.6.5. Indicators of Training Needs

Organization requires launching training for its employees/workers/managers for different purpose. These purposes will drive out the organizations by short falls. Similarly, there may be different problems being faced within in an organization, which can be solved by appropriate training. The following indicators necessitate training:

- Organizational plans: - Changes in goals, programs, structure, technology, people, products, markets and productivity.
- Employee records: - high rates of staff turnover, absenteeism, accidents, low performance.
- Work and work flow: - production bottlenecks and backlogs; high waste, scrap, rejects; job redesign, task relocations, changes in work methods and procedures; new jobs technological changes.
- Employee factors: - Deficiencies in knowledge, skills, attitudes, low morale, poor communication, poor supervision; selection, transfer, promotion of employees (Stanley, 1984:26-27).

2.6.6. Training Methods

The most popular training methods used by organizations can be classified as either on-the-job or off-the-job training.

- a. On-the-job training
- b. Off-the-job training

2.6.6. a. On-the-job Training

This training involves ‘learning while working’. Training takes place on the job. It provides opportunities to the employee to discuss about the real work situation. It is a

process of learning by doing under the supervision of an experienced employee. It is most widely used in practice. These are the following forms of on the job training method.

) **Apprenticeship Training:** - In apprenticeship training, employees learn by working with those who are already skilled in their jobs. The duration of apprenticeship varies from job to job; generally from two to five years. Trainees are allowed to perform sophisticated tasks as their skills and experience increases. A master worker guides the trainee. Apprenticeship programs are effective for acquiring skills and learning crafts. The examples are plumbers, electricians, accountants.

) **Internship Training:** - It is provided to skilled and technical personnel. The goal is to combine practical experience with classroom-oriented theoretical knowledge. Trainees are interned in organizations for a specified period and works as an employee. It blends theory with practice.

) **Job Instruction Training:** - It is a systematic step by step approach to on the job training to teach new task. It is designed for supervisors to train operatives. It is related to specific work situation. It is easy to deliver and an effective low cost training solution to train supervisors. It conducts of four basic steps:

- i. Preparing the trainees by telling them about the job and overcoming their uncertainties.
- ii. Presenting the instruction, giving essential information in a clear manner.
- iii. Having the trainees try out the job to demonstrate their understanding.
- iv. Placing the workers into the job, on their own, with a designed resource person to call up on should they need assistance.

2.6.6. b. Off-the-job Training

Training takes place outside the work station. It is mostly classroom based. The trainees focus on learning experience. The methods used for off-the-job training are:

) **Class Room Lectures or Conferences:** - This approach is well adapted to conveying specific information-rules, procedures or methods. It is based on talking and showing. It is training by telling. The use of audio-visual aids like films, video, television, projector etc makes the formal presentation interesting.

) **Simulation Exercises:** - Simulation is an abstraction of real working conditions in the labor classroom. Trainees get training by being placed in an artificial environment closely resembling with actual working condition. Pilots are trained in this way. There may be two types: a) computer modeling b) vestibule training.

Programmed Instruction: - The programmed instruction technique can be in the form of programmed texts or manuals, while in some organizations teaching machines are utilized. All programmed instruction approaches have a common characteristic. They condense the material to be learned in to highly organized, logical sequences, which require the trainee to respond. The ideal format provides for nearly instantaneous feedback that informs the trainee, if his/her response is correct.

) **Experimental Exercises / Role Play:** - Hearing by doing is experimental exercise. Trainees are told to act role to learn behavior appropriate for the job.

2.6.7. Appraisal of Training Effectiveness

Management should know that once employees are trained, it should lay on them efficiency more than before. Otherwise, training programs merely increase cost and

nothing more. To make training goals achieved, management should use criteria or methods to evaluate the effectiveness of training. The widely used or studied/lectured methods for evaluating training effectiveness are:

1. Observation Method

Trainees are closely observed during the delivery of training programs by trained experts. Changes in knowledge, skills and attitudes of trainees are assessed by observing them during the time they are on the jobs. While being observed, trainees' errors and mistakes are observed carefully and recorded. Trainees are led to participate, discuss debate, play role, study the given case, interact, present, and the effectiveness is measured.

2. Test-retest Method

Participants are given a test to establish their level of knowledge before they enter the training program. After the program is completed, they retake the test. The change in test scores indicates the change in the level of knowledge resulting from training.

3. Pre-post Performance Method

The actual job performance or behavior of each participant is evaluated and rated prior to training. After the training is completed, the participant's job performance is reevaluated. The change in job performance is attributed to training.

4. Experimental Control Group Method

When this method is used to measure the effectiveness of training, the trainees are divided into two groups: control group and experimental group. The members of control group work on the job without undergoing training. The members of experimental group undergo training and work on the job. Two groups are reevaluated at the end of training.

If the performance of experimental group is higher than the performance of control group, training is assessed being effective.

5. Training Surveys

This refers to direct questioning to trainees to gather the reactions about training programs. The participants are asked to fill-up a form after the end of training. Such forms, after being filled up the trainees, are taken back from trainees. Effectiveness of training can be measured in this way.

6. Cost Effective Analysis

It assesses total value of training benefits against total costs of training. The training is said to be effective if the total value or benefits of training exceeds its costs.

2.7. Value Engineering/ Analysis

2.7.1. Concept

Value engineering (also known as value analysis) is a systematic interdisciplinary examination of factors affecting the cost of a product or service in order to devise means of achieving the specified purpose at the required standard of quality and reliability at target cost. The aim of value engineering is to achieve the assigned target cost by

- a. Identifying improved product designs that reduce the products costs with out sacrificing functionality and/or
- b. Eliminating unnecessary functions that increase the products costs and for which customers are not prepared to pay extra for (Drury, 2000:892).

Value engineering is also a systematic, usually team-based approach to evaluating a products design in order to identify alternatives that will improve the products value,

defined as the ratio of functionality to cost. Therefore, there are two ways to improve value: hold functionality constant and reduce cost hold cost constant and increase functionality. It looks at all of the products elements, including the raw materials and manufacturing process and types of labor and equipment used and the balance between purchase and self manufactured components (Kaplan &Atkinson, 1988:223).

Value analysis is an important technique for productivity improvement. It refers to the technique to improve the value of product at reduced cost. It is also considered as modified form of methods study. It aims at achieving overall improvement in efficiency. Thus, value analysis is an approach to cost reduction, which emphasizes function rather than methods; identifies excessive or unnecessary costs, improves the value of the products or service; provides the same or better performance at lower costs; and reduce neither quality nor reliability.

The purpose of value analysis is to simplify products and processes. Its objective is to achieve equivalent or better performance at lower cost while maintaining all functional requirements defined by the customer. It does this by identifying and eliminating unnecessary cost. Technically, it deals with products already in production and is used to analyze product specifications and requirements as shown in production documents and purchase requests. Typically, purchasing departments use value-analysis as a cost reduction technique. Performed before the production stage, value engineering is considered a cost avoidance method. In practice, however, there is a looping back and forth between the two for a given product. This occurs due to the fact that new materials,

processes and so forth require the application of value analysis techniques to products that have previously undergone value engineering.

The value analysis approach involves brainstorming such questions as:

-) Does the item have any design features that are not necessary?
-) Can two or more parts be combined into one?
-) How can we cut down the weight?
-) Are there nonstandard parts that can be eliminated? (Chase, Aquilano & Jacobs, 1999:92).

Since early 1960s, it has emerged as a powerful technique to reduce costs, literally, it is analyzing the value of a product, service or system various, interpretations apart, and value is the relationship between function and cost, i.e.

$$\text{Value} = \frac{\text{Function}}{\text{Cost}}$$

For a given function, to be performed or end Use of an item, the price being part is the major determinant. Value is a subjective concept and is a combination of a quality, efficiency, price and service. It is related to ultimate economy and satisfaction of the consumer. By dissecting these components, an optimal combination is sought which obviously is the least cost value. This lowest overall cost alternative value has to be consistent with the requirements of performance, maintainability, appearance etc. The needed performance has to be at minimum cost (Nigam & Sharma, 1992:397).

Value analysis is an organized effort to reduce the cost of purchased parts and materials. It involves a study of items or services that are to be purchased in sufficient quantities to justify study. It seeks to answer such questions: what is the function of the item? Is the function necessary? Are all its features necessary? Can a standard part that will serve the function be found? What does this substitute cost? The concept sometimes applied by a team or task force that may involve engineering, production & purchasing in a review of existing and new products to ensure that expenditures result in the receipt of appropriate value (Dilworth, 1993:196).

2.7.2. Procedure used in VA program

Two general conceptual tools appear basic to the operation of VA program. They are:

1. Design analysis of the required material.
2. Cost analysis of the required material.

Design Analysis

This procedure, step by step, studies all phases of the design of a given item in relation to the function it performs. The philosophy of the approach is not concerned with appraisal of any given part rather the appraisal focuses on the function, which the part or the larger assembly containing the part performs.

This approach is designed to lead the analyst away from a traditional perspective which views a part as having certain accepted characterization and configuration. Instead, it encourages the analyst to adopt broader point of view and to view and to consider whether the part performs the required function both as efficiently and as inexpensively as possible.

Analysis of each component in VA program attempts to answer 4 specific questions:

- a. Can any part be eliminated without impairing the operation of the complete unit?
- b. Can the design of the part be simplified to reduce its basic cost?
- c. Can the design of the part be changed to permit the use of simplified and less costly production methods?
- d. Can less expensive but equally satisfactory materials be used in the part?

An organized VA study usually utilizes a number of men with different types of background, experience, skill, impossible to combine in the person of a single designer. Resulting design changes often permit the substitution of standardized production operation for more expensive operations requiring special set-up work.

2.7.2.2 Cost Analysis

Many manufacturers do not base the selling prices of their products entirely on costs. In some cases, the complexities of multi-product cost accounting make it virtually impossible to determine the exact cost of producing a specific product. In other cases, firms may follow a variable margin pricing policy; where by the mark-up on certain types of product is greater than another's. Still other firms follow the industry leader in establishing product prices.

Whatever the reason, the industrial buyer realizes that many of the prices he pays do not accurately reflect the cost of the product. Moreover, unless the buyer has great bargaining power and substantial knowledge of production costs in some cases he may not know whether he is paying a fair price.

The cost analysis concept helps the purchaser. The concept, as currently practiced, involves the investigation of supplier's probable costs of producing a given product. The analyst constructs estimated elemental costs for materials, labor, manufacturing overhead and general overhead. When totaled, these figures represent the theoretical total cost incurred by an efficient producer.

An experienced analyst, with the use of wage data, material price lists and various industry time standards, can determine total theoretical cost, which reasonably approximates the actual cost. To this figure is added a reasonable profit margin.

Cost analysis plays the following two roles:

- Cost analysis is conducted for currently purchased items whose costs appear excessive. In such cases, the information developed from cost analysis is used as a basis for further price negotiation with the supplier.
- Cost analysis also serves as a means of locating high cost parts, which should be subjected to design analysis. During the course of a cost analysis, some high-cost elements are frequently isolated for the first time. Subsequent design analysis often leads to specification and production modification and ultimately to reduced costs.

The seven phases or steps to the complete VA study and the activities involved in each phase are product selection, information, speculation, analysis, selection and action, evaluation and presentation.

2.7.3. Activities of the study

- i. Product Selection Phase:** select the product having the highest potential savings.

ii. Information Phase: a) Define and price the function, and b) obtain and interpret all the facts.

iii. Speculation Phase: Determine alternative solutions.

iv. Analysis Phase: a) Determine and compare feasibility, b) Determine and compare suitability, and c) Determine and compare costs.

v. Decision and Action Phase: a) Audit effectiveness of the selection, b) Use operating experience to effect further improvement, c) Get departmental and managerial, and d) Prepare new specification.

vi. Evaluation Phase: a) Review key alternatives with all departments and vendors concerned, and b) Select best alternative.

vii. Presentation Phase: Present the findings of the study and action to be taken to all concerned.

It is to be noted that the last phase, namely, presentation of the findings of the study and action since, without further action by the people involved, the entire study will be useless (Nigam & Sharma, 1992:405-406).

2.8. Standardization. Simplification and Specialization

2.8.1 Standardization

In Japan, products are highly standardized and the result is low-pricing products. Goods are produced using Assembly Line Process Technology. Automated machines are used. Goods produced at two different times from the same technology are highly similar. This is the main feature of standardization.

Custom products are likely to be more costly than standardized products, but managers must attempt a balance that clients will accept. Give the appropriate balance; there are many economic benefits to standardization. The cost items affected are raw materials, inventory, in-process inventory, lower set-up costs, longer production runs improved quality controls with fewer items, opportunities for mechanization and automation, more advantageous purchasing better labor utilization, lower costs and so on (Buffa, 2000: 471).

Standardization is an instrument to manufacture maximum variety of products out of the minimum variety of components by means of minimum variety of machines and tools. This decreases working capital requirements and leads to reduction in manufacturing costs.

2.8.2. Specialization

When someone is more specialized in a work, he/she can do the work easier and faster than the one who occasionally does the work. Hence, Japanese manufacturing organization employ such person for work, who is specialized in doing the same. This leads to time and cost saving.

Specialization, in another words, also refers to elimination of product variety so that the operation can be minimized which leads to use of expert knowledge, skill and techniques in production system.

2.8.3. Simplification

When two or more parts are finally assembled rigidly together, perhaps the unit can be designed as one piece, thus eliminating an assembly operation. This is often feasible when a single material will meet the service requirements for all the surfaces and across sections of the parts. Another example is the substitution of plastic snap-on cap on place of a screw-on for some applications. The costs of the materials and labor for the snap-on cap are much less. Simply, the design of services offered has similar implication (Buffa, 2000:471).

Simplification, in a very simple understanding, refers to the elimination of superfluous varieties, dimensions and works.

2.9 Review of Master Degree Thesis

In the context of Nepal, history of manufacturing company is very short. Research on manufacturing company has been conducted very few. Manufacturing company has not been applied cost reduction tools regularly. Some applied but they are not using all tools of cost reduction. Cost reduction has been given less priority than others or it can be said that few students are mainly focused on this topic & still not conducted study in depth. Some research has been reviewed which are as follows:

Dahal, Anuj (2004) has conducted a study on applying cost reduction tools to strengthen manufacturing enterprises of Nepal with the following findings and recommendations.

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 all the sub sectors. Similarly, about 61.11% of the textile firms were found practicing cost reduction. Hence, there is lack of mass participation for cost reduction practice in the manufacturing sector.

Similarly, cost reduction tools were found not equally applied in Nepalese manufacturing sector. Among the tools taken as study variables, training program was found widely applied. About 92% of the samples taken were found conducting training programs. The second highest cost reduction tools being applied has been found benchmarking (79.56% of the samples), and subsequently, M-audit, ABM, TQM, VA, Reengineering, Target Costing, Life Cycle Costing, Time and Motion Study, JIT System and Kaizen Costing. Study has shown that low practice of Time and Motion Study is due to lack of study equipments. JIT System has been lowly practiced due to lack of good relationship with the suppliers. Similarly, Kaizen Costing is being lowly practiced due to lack of Kaizen efforts from the employees.

Recommendations

As all of we know, at present the economists and businessmen are discussing over the issue whether Nepal's entry to WTO will be beneficial to the country or not. They are efforting to know how the entry can be made beneficial. Similarly, the SAFTA protocol

has been signed and the South Asian countries are having a free South Asian markets for their products. In this context, Nepalese manufacturing sector has to rethink for safeguarding the national markets to their products. Among different measures for this; cost reduction is also one of them. But the cost reduction should be accompanied by mass production and wide distribution as well. Based on the findings/ conclusions of this research works, following recommendations have been forwarded for Nepalese manufacturing sector for effective cost reduction purpose.

1. Modern Japanese cost management tools should be widely used. Firms have to think how to make the practice effective. For this they have to find out each and every cause for ineffective practice and preventive measures should be taken.
2. In the present context, firms have to given enough strength to the relationship with the suppliers and give away out for easy application of JIT system. Specially, the electric/electronic firms, textile companies and engineering firms should give efforts for JIT system application.
3. Firms should keep on benchmarking others effective practices and bring corresponding practice to their own ground.
4. Automated technologies have to be widely used. Firms should slowly shift to automated and group technologies from the age-old manual and obsolete mechanized technologies.
5. Management auditors have to conduct audits on varied areas and give improvement suggestions.

6. 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.
7. Employees of the firms should be motivated so that they shall give full Kaizen efforts.
8. Firms should manage the activities with cost.
9. The projects should be analyzed in a way so that it turns profitable throughout the project life. Hence, firms are suggested to use life cycle costing measure.
10. Firms are suggested to conduct time and motion study in their workplace. However, unnecessary movement observed and recorded should be corrected with positive motivation to the employees for Kaizen efforts.

Poudel, Devi Prasad (2005) has conducted a study on applying cost reduction tools to strengthen manufacturing enterprises of Nepal with the following findings and recommendations.

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 all the sub sectors. Similarly, about 61.11% of the textile firms were found

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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.

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3. Firms should keep on benchmarking others effective practices and bring corresponding practice to their own ground.
4. Automated technologies have to be widely used. Firms should slowly shift to automated and group technologies from the age-old manual and obsolete mechanized technologies.
5. Management auditors have to conduct audits on varied areas and give improvement suggestions.
6. 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.
7. Employees of the firms should be motivated so that they shall give full Kaizen efforts.
8. Firms should manage the activities with cost.
9. The projects should be analyzed in a way so that it turns profitable throughout the project life. Hence, firms are suggested to use life cycle costing measure.

Firms are suggested to conduct time and motion study in their workplace. However, unnecessary movement observed and recorded should be corrected with positive motivation to the employees for Kaizen efforts.

2.10 Research Gap

There is a gap between the present research and the previous research. The previous research was made on 30 manufacturing companies by focusing on 14 cost reduction tools. Due to the large area, the study was not conducted in depth. But the present research was made on 15 manufacturing companies by focusing on 6 important cost reduction tools so that the study was conducted in detail and depth. The companies selected for research in the present studies was different from the previous studies. The presented study explored the current state and future potentiality of application of cost reduction tools and techniques in Nepalese manufacturing enterprises.

The previous studies were unable to recommend about the practice of cost reduction tools and techniques. Thus, to fulfill the gap the current study was initiated. The study was survey type. It was based on primary data. It disclosed the reasons about practice of cost reduction tools and techniques. The companies selected in primary survey were found practicing cost reduction tools and techniques. The recommendations provided will help the concern authorities about the cost reduction practices. Probably, this might be one of the best studies conducted on cost reduction tools and techniques of Nepalese manufacturing enterprises.

CHAPTER- III

RESEARCH METHODOLOGY

3.1 Research Design

To conduct this research work, the research design followed is survey method. At least 15 manufacturing enterprises having head offices or contact offices in Katmandu valley have been studied. The study has explored the current state and future potentiality of applying cost reduction techniques in Nepalese manufacturing enterprises.

3.2 Sources of Data

This research work is mostly based on primary data. The study was conducted collecting information via unit visits. Therefore, primary source of data was also used. A questionnaire with multiple-choice answers was prepared before the visit, and distributed during the visit to the units under study. Some information was taken from the newspapers, magazines, and some others have taken from the internet sites. Therefore, both primary and secondary data sources were adopted.

3.3 Population and Sampling

All the manufacturing enterprises established and operating in Nepal were taken as population of the research study. The samples were taken using stratified, convenient and random and judgmental (purposive) sampling procedure. The samples will be stratified as follows:

- Food, Beverages and Tobacco

- Textile and Garments
- Chemical and Pharmaceuticals
- Technical and Engineering
- Electrical and Electronics.

All those manufacturing enterprises having Katmandu based head offices or contact offices were taken as target population. Out of the target population, some 15 manufacturing enterprises were sampled selecting at least two samples from each group.

3.4 Data Collection Procedures

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

3.5 Data Analysis Procedures

The collected information has been tabulated in a frequency distribution for the purpose of data presentation, analysis extract of findings. As per the respondents are given opportunities for giving more than just one answers to the questions, the column totals reflect sampled enterprises from each group and the row totals show the total number of enterprises choosing a particular answer. For the analysis of data, percentage analysis methods were adopted.

3.6 Research Variables

This research will be conducted using the following research variables:

I. JIT System

JIT means producing what is needed, when needed and no more. Anything over the minimum amount necessary is viewed as waste, because effort and material expended for something not needed now cannot be utilized now. This is in contrast to relying on extra materials just in case something goes wrong (Chase & Jacobs, 1999:327).

II. Total Quality Management

Total Quality Management (TQM) is a comprehensive set of management tool, management philosophy, and improvement methods. It is used to represent the concept and practice of Japanese quality control more properly than the term Total Quality Control (TQC). It is concerned with the integration of all the efforts in the organization towards quality improvement, quality development and quality maintenance to meet the full customer satisfaction at an economical way. Simply speaking, TQM means activities involving everyone in a company towards improving performance at every level (Manandhar, 2057:147).

III. Activity Based Management

The term Activity-Based-Management (ABM) or Activity-Based Cost Management (ABCM) are used to describe the cost management application of ABC.

ABM views the business as a step of linked activities that ultimately add value to the customer. It focuses on managing the business on the basis of activities that make up the organization. ABM is based on the premise that activities consume costs. Therefore, by

managing activities, costs will be managed in long term. The goal of ABM is to enable is to enable customer needs to be satisfied while making fewer demands on organizational resources (Drury, 2000:987).

IV. Value Analysis/ Engineering

Value analysis is an important technique for productivity improvement. Value analysis in broader sense is value engineering and refers to the technique to improve the value of a product at reduced cost. It is also considered as modified form of methods study. It aims at achieving overall improvements in efficiency. Thus, value analysis is an approach to cost reduction, which emphasizes function rather than methods; identifies excessive or unnecessary costs improves the value of the products or service; provides the same or better performance at a lower costs and reduce neither quality nor reliability (Manandhar & Shrestha, 2057:143).

V. Training Schemes

Training seeks to improve ability to perform present jobs. It is skill-oriented, generally given to operate employees who do not supervise the activities of others. It is remedial in nature (Agrawal, 2057: 181).

Training is the organized procedure by which people learn knowledge and/or skills for a definite purpose (Beach, 1980:244).

VI. Standardization, Simplification & Specification.

Standardization is an instrument to manufacture maximum variety of products out of the minimum variety of components by means of minimum variety of machines and tools. This decreases working capital requirements and leads to reduction in manufacturing costs.

When two or more parts are finally assembled rigidly together, perhaps the unit can be designed as one piece, thus eliminating an assembly operation. This is often feasible when a single material will meet the service requirements for all the surfaces and across sections of the parts (Buffa, 2000:471).

Simplification, in a very simple understanding, refers to the elimination of superfluous varieties, dimensions and works.

Specialization, refers to elimination of product variety so that the operation can be minimized which leads to use of expert knowledge, skill and techniques in production system.

CHAPTER- IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Cost Reduction Practice in Nepal

4.1.1 Profit and Wealth Maximization Practice

A survey was conducted on 15 manufacturing enterprises to know how about the achievement of profit and wealth maximization objective. The following results were obtained upon analysis of the survey.

Table 4.1

Profit-cum-wealth Maximization Practice

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Increase in volume of sales	2	1	2	-	2	7
Increase in selling price	1	-	-	1	-	2
Reduction in operation cost	1	1	-	2	1	5
Increase in volume of sales & reduction in operating cost both	1	-	-	-	-	1
Total	5	2	2	3	3	15

The firms used more than one measures at a time. Out of 15 manufacturing firms sampled, about 7 firms were found going for sales increase for maximizing their profit and wealth. This is about 46.67% of the total sampled firms. At the same time, 5 firms representing 33.33% of the total were also found reducing their operating cost. And 2

firms occupying 13.33% found increasing their selling price. Only 1 firm out of 15 firms 6.67% found looking for both increase in volume of sales and reduction in operating cost. A total of 5 manufacturing firms from FBT section were sampled. 2 firms (i.e. 40%) were found increasing sales for profit and wealth maximization purpose. About 20% of the firms (1 out of 5) used increase in selling price where 20% of the firms (1 out of 5) were going for the reducing in operating cost. 20% firms (1 out of 5) were also found going for both increasing in sales volume & reducing in operating cost.

About 2 Chemicals & pharmaceuticals firms were included in the sample. 50% of the firms choose for increase in selling price where as 50% also chooses for reduction in operating cost for maximizing profit and wealth.

About 2 firms from Electrical & Electronic sub-sector were included in the survey. All of the sampled firms 2 out of 2 with 100% choose increase in volume of sales for maximizing profit and wealth.

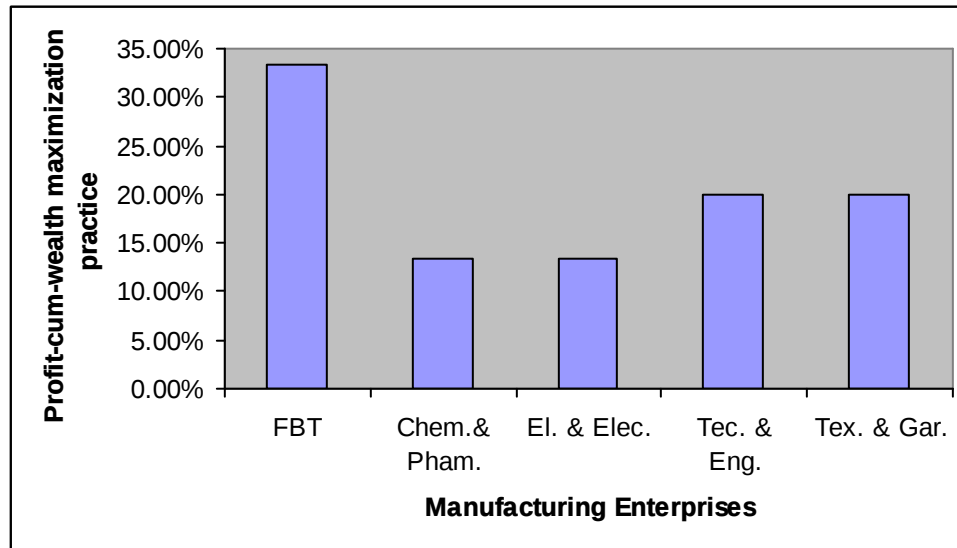
Similarly, about 3 firms from Technical & Engineering were included in the sample. 1 out of 3 (33.33%) were favoring for increase in selling price and 2 out of 3 (66.67%) were going for reduction in operating cost for profit and wealth maximization.

Finally, 3 sample firms were taken from Textile & Garment sub-sector. 2 out of 3 (66.67%) firms choose for increasing volume of sales and 1 out of 3 (33.33%) firms choose for reduction in operating cost for profit and wealth maximization.

The Bar Diagram is presented as below:

Figure 4.1

Profit-cum-wealth Maximization practice



4.1.2 Managing Lower Price of Products

Reduction in the cost can be achieved with a drive to adjust selling price of the products. It means that a firm adjust selling price of the products. There are so many optimal activities for attaining the purpose. An organization may bargain with its suppliers for charging low price of the materials so that selling price can be set at a minimum. An organization may also go for tender purchase to control its operation cost as well as selling price. And the business house can also minimize selling price by pre-negotiating with the suppliers at an agreed price. This study was conducted over those 15 manufacturing firms. The following results are available regarding the current practice of these firms for setting lower price of their products.

Table 4.2

Measures applied for Lowering Selling Price

Particulars	FBT	Chem. & Pham.	El.& Elec.	Tec.& Eng.	Tex & Gar.	Total
Bargaining with suppliers	-	-	-	-	1	1
Tender Purchase	2	1	2	2	2	9
Pre-negotiation at an agreed price	3	1	-	1	-	5
Total	5	2	2	3	3	15

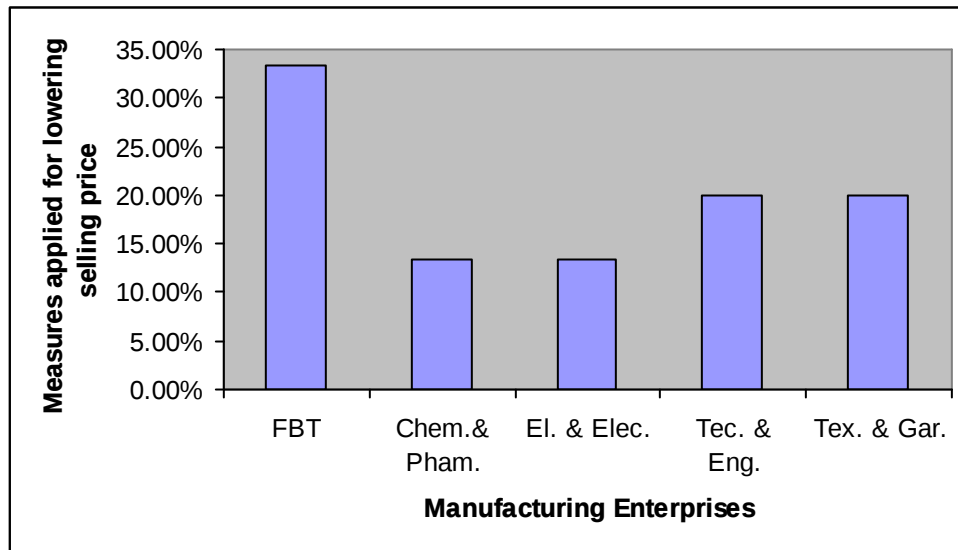
60% of the firms sampled were favoring tender purchase of material to minimize its operating cost and set minimum price to its customer. At the same time 33.33% of firms were also found pre-negotiating with suppliers at an agreed price to lower its selling price. Similarly, 6.67% of the firms were also found bargaining with suppliers for materials to minimize selling price.

According to the data collected, 40% firms from FBT followed tender price where as 60% followed pre-negotiating with suppliers at an agreed price. From Chemicals & Pharmaceuticals group followed equally tender price and pre-negotiation price. Similarly, 100% of the Electrical & Electronic firms were found following tender purchase. About 66.67% of the Technical & Engineering firms believed in tender purchase and 33.33% managed price by pre-negotiating with suppliers. However, 66.67% of the sampled Textile and Garments firms were going for tender purchase and 33.33% believed in bargaining with suppliers for lowering selling price.

The Bar Diagram is presented as below:

Figure 4.2

Measures applied for Lowering Selling Price



4.1.3 Areas Selected for Cost Reduction

A survey was conducted to gather information on the cost-related problems of the organizations desiring in conducting cost reduction program. The results showed that most of the firms were suffering in the area of selling and distribution of products. High selling and distribution cost were found in about 33.33% of the firms studied. Similarly, 20% of the firms suffered in production planning and control area where as 13.33% of the sampled firms equally suffered in various areas like product design, organizational operation and financing activities. Only 6.67% of the sampled firms suffered in equipment and plant layout area respectively.

Table 4.3**Areas selected for Cost Reduction**

Particulars	FBT	Chem. & Pham.	El.& Elec.	Tech. & Eng.	Tex. & Gar.	Total
Product Design	-	-	1	-	1	2
Organizational Operation	1	-	-	-	1	2
Production Planning & Control	-	-	-	2	1	3
Equipment & Plant Layout	-	-	-	1	-	1
Administration procedure	-	-	-	-	-	-
Selling & Distribution procedure	3	1	1	-	-	5
Financing Activities	1	1	-	-	-	2
Purchase of Material & their Control	-	-	-	-	-	-
Total	5	2	2	3	3	15

From the view point of FBT enterprises, various firms were bearing high cost in selling and distribution procedures. 60% of the firms suffered from cost problem in this area. 20% of each firms suffered from cost problem in Organizational Operation and Financing Activities as well. The firms from Chemicals & Pharmaceuticals were found suffering equally in the area of selling and distribution procedure and financing activities. The firms from Electrical and Electronic also equally suffered in the area of product design and selling and distribution procedure. The firms relating to Technical and Engineering group suffered mostly in the area of production planning and their control i.e.66.67%. And remaining 33.33% of the firms suffered in equipment and plant layout procedure. Similarly, Product Design, Organizational Operation and Production Planning & control were the areas cost of heavy being incurred cost equally by Textile & Garment firms.

4.1.4 Application of Cost Reduction Tools

As described earlier, there are various modern cost reduction tools which are being used by Japanese manufacturing companies at present. This section dealt with study about the current status/application of all or any of these tools on Nepalese business environment. The selected fifteen companies were taken to know about their practice taking the reference of cost of high adopting cost reduction tools.

4.1.4.1 Application of Jit System

The study on the status of Just-in-time system in Nepalese manufacturing firms has revealed about 3 firms out of 15 firms (about 20%) claimed that they are using just in time system and the rest 12 firms(about 80%) denied the possibility for application of JIT in Nepalese manufacturing concern. The table describing more briefly is mentioned below.

Table 4.4
Application of JIT system

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Applying	1	-	-	-	2	3
Not Applying	4	2	2	3	1	12
Total	5	2	2	3	3	15

The study has shown that JIT system has not been popular in Nepalese context. Out of the total sampled firms studied, only 3 firms claimed that they are using/enjoying JIT

system. Out of the 3 companies, 1 was fall under Food, Beverages & Tobacco group and the remaining 2 were fall under Textile & garments industries.

Table 4.5

Practice of JIT Production/ Purchasing

Particulars	FBT	Tex. & Gar.	Total
JIT Production/ Manufacturing	1	2	3
JIT Purchasing/ Zero inventory system	-	-	-
Total	1	2	3

Out of the total samples collected, only 3 manufacturing enterprises have been found applying JIT system. Only one firm relating to Food, Beverages and Tobacco firms and the remaining 2 from Textile & Garment factories have been found applying JIT System. All of them were seen following JIT Production/ Manufacturing procedure.

Table 4.6

Perquisites Managed for Applying JIT System

Particulars	FBT	Tex. & Gar.	Total
Long-term relationship	1	1	2
Small Frequent Deliveries	-	1	1
Total	1	2	3

Food, Beverages and Tobacco firms are found going with long-term stable relationship. The Textile and Garment are found managing both long term stable relationship and small frequent deliveries as well.

4.1.4.2 Application of Total Quality Management (TQM)

Table 4.7

Application of TQM approaches

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Practicing	3	2	2	2	2	11
Not Practicing	2	-	-	1	1	4
Total	5	2	2	3	3	15

About 73.33% of the firms among those studied firms were applying total quality management and rests 26.67% firms did not use TQM at all. In the same study, 60% of FBT firms, 100% of Chemicals and Pharmaceuticals as well as Electrical and Electronic, 66.67% of Technical and Engineering as well as Textile and Garment were TQM firms and rest of the firms were non-TQM firms.

Quality Related Costs in Organization

The significance given to TQM can be known from the portion of quality related cost (i.e. the cost to be borne due to quality failure). Quality refers to the conformity to standardized specifications, the minimal acceptable features in a product of a particular class. Generally, accepted principles are that high-class products are of highly qualities. So, quality must be maintained in production. Otherwise, different failures like sales return, more after sales support service, more leakage and break down can occur. These bring cost in the organizations. Quality related costs are of two types: one is

precautionary cost and next is failure cost. Precautionary costs are also of two types: prevention cost & appraisal costs and external failure costs.

Table 4.8
Quality-related Costs in Manufacturing Enterprises

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Prevention costs	2	2	2	2	1	9
Appraisal costs	1	-	-	-	1	2
Total	3	2	2	2	2	11

A study was made over TQM firms and the fact found was that most of the TQM firms maintained quality with the preventive measure. About 81.81% TQM firms agreed that they do more preventive works for checking the quality of their products before reaching to the targeted customers. Purely all the rest TQM firms, i.e.18.19% firms concluded that they have been able to maintain quality so far with the help of appraisal works.

Table 4.9
Quality of Design/Conformance/Service Address

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Quality of Design	-	-	1	1	-	2
Quality of Conformance	1	2	-	-	1	4
Quality of service	2	-	1	1	1	5
Total	3	2	2	2	2	11

The study/ research have shown that most of the firms are addressing quality of service for quality conformity. About 45.45% of the samples were addressing for the quality of

service. 36.36% of the firms were addressing quality of conformance where as only 18.18% of the firms were found addressing for quality of design.

In the same study, it has been found that quality of service is high in the firms falling in FBT sector. Almost all of the firms (i.e.100%) related to Chemical & Pharmaceutical believed in Quality of Conformance. Similarly, 50% each of Electrical and Electronic firms believed in quality of design and quality of service. Technical and Engineering firms were also agreed as like Electrical and Electronic. Finally, Textile and Garments industries were equally focused on quality of conformance and quality of service as well.

4.1.4.3 Application of Value Engineering/Analysis

The research made over those fifteen manufacturing enterprises has shown the following final results.

Table 4.10

Value Engineering Practice

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Yes	3	2	1	2	1	9
No	2	-	1	1	2	6
Total	5	2	2	3	3	15

About 60% firms surveyed were found using value engineering approach. Rest 40% firms said that they are not currently using this tool. It were found that 60% of the FBT enterprises followed this approach where as% were not following. In the same way 100% firms related to Chemicals and Pharmaceuticals were keen in using this approach. Value

engineering practice was used by 50% of Electrical and Electronic, 66.67% of Technical and Engineering and 33.33% of Textile and Garment enterprises.

Procedure of Value Engineering Analysis

From the above analysis, we have seen that most of the firms are using value engineering analysis. The table presented below has shown that 44.44% of the firms are using design analysis tool and the rest 55.56% of the firms are using cost analysis procedure.

Table 4.11

Procedure of Value Engineering/Analysis

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Design Analysis	1	2	-	-	1	4
Cost Analysis	2	-	1	2	-	5
Total	3	2	1	2	1	9

4.1.4.4 Activity Based Management Practice

Activities of business firms can be classified into two parts. One is value-added activities and the next non-value-added activities. From the view point of cost reduction-cum-management, non value added activities must be stopped, eliminated or reduced as they do not add any value to the products and only add costs. As a result, products price go up without increase in the value, and thus, the public cannot afford them. These products may not be able to compete with cheaper products imported from abroad. So, value added activities are to be promoted and non-value added activities must be eliminated.

Table 4.12

Activity Based Management Practice

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tec. & Eng.	Tex. & Gar.	Total
Yes	3	2	1	2	1	9
No	2	-	1	1	2	6
Total	5	2	2	3	3	15

In a research made upon Nepalese manufacturing firms, 60% firms were found considering values to decide whether particular activities need to be conducted or not. It means, activities are highly managed in Nepalese manufacturing firms.

Rest 40% firms are not considering the value of the activity they conduct. About 60% of the firms from FBT group were ABM suppliers. Cent percent of chemical and pharmaceuticals firms, 50% of electrical and electronic, 66.67% of technical and engineering and 33.33% of textile and garment firms studied were found ABM appliers.

There are number of ways or methods to conduct ABM. The research has also found out the fact that most of Nepalese manufacturing firms are using activity sharing for ABM program. In a survey, 55.55% firms were found using activity sharing for ABM approach. Likewise, 33.33% used activity selection and only a few firms 11.11% firms used activity reduction. None of the firms were found using activity elimination.

Table 4.13

Technique of Activity Based Management

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Activity reduction	-	1	-	-	-	1
Activity elimination	-	-	-	-	-	-
Activity selection	1	-	-	1	1	3
Activity sharing	2	1	1	1	-	5
Total	3	2	1	2	1	9

From the above table, it is found that 33.33% of FBT firms use activity selection and 66.67% use activity sharing. Chemicals and pharmaceuticals firms equally used activity reduction as well as activity sharing. Also cent percent of electrical and electronic as well as textile and garment were found using activity sharing and activity selection respectively. The firms related to technical and engineering used both activity selection and activity sharing.

4.1.4.5 Conduction of Training Programs

Employees of an organization are the means whose high involvement helps organizations achieve the goals. Organizations are set up with certain goals. Goals of an organization may change on timely requirement. Whatsoever be the goals of the firms, they necessitate special set of qualification and expertise in the manpower. Organizations assess the present expertise in their employees, determine needed expertise to accomplish task to achieve goals easily, find the gap between the required expertise and existing expertise,

and organize training program to fill in employees all required expertise so that the gap is nullified.

In Nepal, employees are found given training. In a research, almost all the firms claimed that they occasionally or regularly, but at least, provide training to their employees. Similarly, almost all the firms claimed that on-the-job training is highly practiced in comparison to the off-the-job training.

Table 4.14
Practice for Conduction of Training Program

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
On-the-job training	3	1	2	2	2	10
Off-the-job training	1	1	-	1	-	3
Both	1	-	-	-	1	2
Total	5	2	2	3	3	15

The findings show that on-the-job training is highly prevalent in manufacturing sector in Nepal. About 66.67% firms claimed that they give most of their employee's on-the-job learning. Off-the job training was found practiced in only 20% of the firms. Also 13.33% of the firms were found giving both on-the-job& off-the-job as well.

On-the-job training was found conducting by 60% of FBT, 50% of chemical & pharmaceutical, 100% of Electrical &Electronic, 67% of Technical & Engineering, Textile & Garment firms. Similarly, off-the-job training was given by FBT, chemicals &

pharmaceuticals, technical & engineering. Also it was found that FBT, textile & garment provided both the training.

Types of On-the-Job Training Programs Applied

Table 4.15

Types of On-the-Job Training Programs applied

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Apprenticeship Training	2	-	2	-	2	6
Internship Training	1	-	-	1	-	2
Job Instruction Training	1	1	-	1	1	4
Total	4	1	2	2	3	12

Different firms were found conducting different training programs. According to the above presented table, it is concluded that 50% of firms uses apprenticeship training, 17% internship training & 33% job instruction training.

Also, FBT focused on all the on the job training. Similarly, only job instruction training was provided in chemicals and pharmaceuticals firms. However, apprenticeship training was found in electrical and electronic firm. Technical & engineering focused on both internship training and job instruction training as well. Finally, textile and garment firms were found using apprenticeship training and job instruction training.

Types of Off-the-Job Training Programs Applied

Table 4.16

Types of Off-the-Job Training Programs Applied

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Lecture/Conference	1	1	-	1	-	3
Simulation exercises	-	-	-	-	-	-
Programmed instruction	-	-	-	-	-	-
Experimental exercises	1	-	-	-	1	2
Total	2	1	-	1	1	5

In off the job programmed instruction, lecture/conference was highly used. 60% of the firms used this program. Especially, FBT, chemicals & pharmaceuticals, technical & engineering were found conducting lecture/conference off the job training program. Experimental exercises were also found using by FBT and technical & engineering firms. In conclusion it is found that the firms are mostly focused on applying lecture/conference and experimental exercises for conducting off the job training program.

Factors Necessitating Training Program

Training is an urge to nullify the gap between the qualities existing in employees presently, and what level of qualities employees require to accomplish expected level of performance. Many factors necessitate training to employees. In the research, it was found that change in organizational plans have been the most prime factors to urge for training to employees in Nepalese firms.

The research made over 15 firms has revealed the facts that change in organizational plans are prime factors, which necessitate training to employees.

About 73% of the firms sampled were found analyzing change in organizational plans to determine whether training for employees have been required or not. Also, 13% firms has been found following employees records like absenteeism, break of discipline, punctuality etc and employees factors like experience, gender, age etc. for determining training needs.

Table 4.17
Factors Necessitating Training Programs

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech.& Eng.	Tex. & Gar.	Total
Change in organizational plan	4	2	1	2	2	11
Employee records	-	-	1	-	1	2
Employee factor	1	-	-	1	-	2
Total	5	2	2	3	3	15

From the above table, it can be said that (4 out of 5) firms relating to FBT were taking the plan of the organization as the determinant of training and (1 out of 5) focused on employee factor. Similarly, chemicals & pharmaceuticals firms (2 out of 2) believed in change in organizational plans for determining training needs. Electrical & electronic firms were focusing equally on organizational plans as well as employee records. Technical & Engineering firms felt necessary for training on change in organizational plans and employee records. Majority firms relating textile and garments found weakness

of employees for change in organizational plans and minority for employee records for not conducting training.

Methods used for Evaluating training Effectiveness

The research made has shown that Nepalese manufacturing firms are using many methods to evaluate the effectiveness of the training given. Altogether, more than 15 firms were sampled .47% firms evaluated training programs by observation method. Similarly, test-retest method and experimental control group method have been found being used by 7% of the firms.13% have been using pre-post performance method and 27% using cost effectiveness analysis for evaluating training programs.

Table 4.18

Methods used for Evaluating Training Programs

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech.& Eng.	Tex. & Gar.	Total
Observation method	3	-	2	1	1	7
Test-retest method	-	-	-	-	1	1
Pre-post performance method	1	1	-	-	-	2
Experimental control group method	-	1	-	-	-	1
Training surveys	-	-	-	-	-	-
Cost effectiveness analysis	1	-	-	2	1	4
Total	5	2	2	3	3	15

From another angle of study, it has been found that FBT firms (60%) have been highly using observation method and the rest using equally pre-post performance method and cost effectiveness analysis. Similarly, equally % of firms relating chemical and

pharmaceutical have found using pre-post performance method and experimental control group method. Cent percent electrical and electronic firms are seen using observation method. Cost effectiveness analysis has been found being highly used by technical and engineering firms. To evaluate training effectiveness, textile and garment firms uses most of the methods like observation method, test-retest method, cost effectiveness analysis etc.

4.1.4.6 Measures Applied to Control Wastages & Leakages

Almost in all of the manufacturing enterprises, there is found wastages and leakages. For the industry profit, it is necessary to control the wastages and leakages. According to the samples collected from different firms, various measures or tools have been found applied to control the wastages and leakages as well. All the measures and tools are presented in the table.

It is seen that most of the firms are using skilled and trained manpower to control the wastages and leakages. From the survey, it is found that 40% of the firms are using skilled and trained manpower where as only 7% are using qualitative raw material or taking regular physical verification to reduce the leakages as well as wastages. Re-cycle/re-use or re-processing process has been found in 33% of the firms. Also, 13% firms have been found using FIFO system. It is concluded that almost firms are aware of wastages and leakages and applying different measures and tools.

Table 4.19**Measures Applied to Control Wastages & Leakages**

Particulars	FBT	Chem. & Pharm	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Re-cycle/re-use	2	1	-	2	-	5
Using qualitative raw material	1	-	-	-	-	1
Using skilled & trained manpower	2	1	2	1	-	6
Regular physical verification	-	-	-	-	1	1
FIFO system	-	-	-	-	2	2
Maintain balance temperature	-	-	-	-	-	-
Total	5	2	2	3	3	15

From the above table, 40% of the firms related to FBT uses re-cycle/reuse and skilled and trained manpower each to reduce wastages. Only 20% firms were found using qualitative raw material. Chemicals and pharmaceutical firms applied re-cycle process and skilled and trained manpower equally. Electrical and electronic firm were found highly using skilled and trained manpower for the reduction of wastages. 67% firms of technical and engineering applied re-cycle process where as only 33% applied skilled and trained manpower schemes. Also FIFO process was applied by 67% of textile and garment firms and regular physical verification by 33% of the firms. None of the firms were found maintaining appropriate or balance temperature for the reduction of wastages as well as leakages.

4.2 Failure to Cost Reduction Practice

4.2.1 Failure on Applying JIT System

According to the samples collected, 80% of the total firms were non-JIT Company. 50% of such companies accepted that JIT has been non-applicable to them due to non-availability of suppliers. About 50% claimed some other reason for the same. Among them 42% claimed for lack of skill and experience manpower and 8% for lack of information. Most of the companies claimed that JIT is not applicable to them due to various reasons like strike, political instability, political in transparency, uncertainty of transportation etc.

Table 4.20

Failure in Applying JIT System

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Lack of skill & experience manpower	2	2	-	1	-	5
Non-availability of suppliers	2	-	1	2	1	6
Lack of information	-	-	1	-	-	1
Total	4	2	2	3	1	12

Studies made over non-JIT FBT firms showed that 50% of the companies are suffering from skill & experience manpower and 50% from non-availability of suppliers. Only the lack of skill & experience manpower for failure in applying JIT was seen in chemicals and pharmaceuticals firms. Similarly, non-availability of suppliers and lack of information were seen in electrical and electronic firms. Majority numbers of technical & engineering firms have been found failure due to non-availability of suppliers and minority due to

lack of information. Textile and garments firms were only suffering due to non-availability of suppliers for applying JIT system.

In total study, about 42% were with low skill and experience manpower, 50% were with non-availability of suppliers, and only 8% were with problem of limited information.

4.2.2 Failures in Applying TQM

Internal failure cost was found in about 75% of non-TQM firms, and external failure costs were being borne by rest 25% of the firms.

Table 4.21

Failure Costs in Manufacturing Enterprises

Particulars	FBT	Chem. & Pham.	El.& Elec.	Tech. & Eng.	Tex. & Gar.	Total
Internal Failure Cost	2	-	-	-	1	3
External Failure Cost	-	-	-	1	-	1
Total	2	-	-	1	1	4

Results showed that internal failure cost is high in FBT and Textile/Garment firms, and external failure in Technical/Engineering firms.

The study made over the non-TQM firms has revealed that the firms are undergoing lack of skilled and experienced manpower.

Table 4.22

Failures in Applying TQM

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Lack of skilled manpower	1	-	-	1	1	3
Quality is not a problem	-	-	-	-	-	-
Low team spirit	1	-	-	-	-	1
Low employee participation	-	-	-	-	-	-
Total	2	-	-	1	1	4

About 75% of these firms said that they are suffering from lack of skills in their manpower to work in a new/changed context. However, 25% firms were lacking of team spirit in their employees. None of the firms said that quality was not a problem or there was a low participation of employees in their organizations.

4.2.3 Failures in Applying Value Engineering Analysis

As reviewed earlier, value engineering is an important tool being used in the modern Japanese manufacturing firms for the purpose of reducing the cost. So, the research made over those firms to know the present status of application of the said tool in our Nepalese firms should be accompanied with the research to know reasons for not applying the tool, with an objective to remove the causes and make convenient applications. The result found was that the application of the tool is being disturbed by the lack of required experience and experts for the application of the tool.

For applying value engineering analysis properly, most of the organizations have failed due to different reasons. Value engineering is meant being a monster for the workforce as it points out the unnecessary work (one that does not add value), and any of some of the workers may be losing the job. Therefore, organizations found suffering from unnecessary hurdles from their workmen for applying this tool.

Table 4.23

Failures in Applying Value Engineering

Particulars	FBT	Chem. & Pham.	El. & Elec.	Tech. & Eng.	Tex. & Gar.	Total
Lack of experience & experts	1	-	1	-	2	4
Lack of qualified manpower	1	-	-	-	-	1
Obstacle from the workforce	-	-	-	1	-	1
Total	2	-	1	1	2	6

About 67% of the firms found suffering from due to lack of experience and experts employees in their organizations for applying value engineering. Similarly 17% firms were also suffering due to lack of qualified manpower. Likewise, obstacle from the workforce also affected 17% of the firms.

From the above table, it is seen that FBT firms suffering due to lacking of experience & experts employees and qualified manpower. Electrical/Electronic firms were also found highly lacking of experience & experts employees. Similarly, Technical/Engineering firms faced the obstacles from the workforce for applying value engineering. The firms

manufacturing Textile/Garments as well were highly found lacking of experience & experts employees in their organizations for applying value engineering.

4.2.4 Failure in Applying Activity Based Management (ABM)

For the conduction of activity based management, various questions were asked for not conducting the value of activity. Different alternatives were found such as poor organizational culture, fixed non-value activities, lack of top management support etc. Those reasons made the difficulties to enforce ABM.

After survey, it was identified that only 60% firms applied ABM where as 40% firms did not apply ABM. It is presented in the following:

Table 4.24

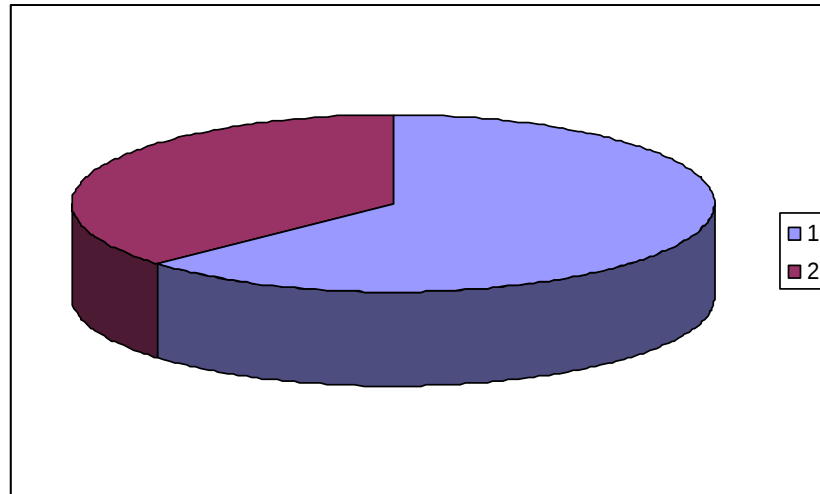
Failures in Applying ABM

Particulars	FBT	Chem. & Pham.	El.& Elec.	Tech. & Eng.	Tex. & Gar.	Total
Poor organizational culture	2	-	-	-	1	3
Fixed non-value activities	-	-	1	1	-	2
Lack of top management support	-	-	-	-	1	1
Total	2	-	1	1	2	6

About, 50% of the firms were found suffering for the application of ABM because of poor organizational culture.33% firms accepted their failure for fixed non-value activities. Also 17% firms accepted top management support for not applying ABM.

Figure 4.3

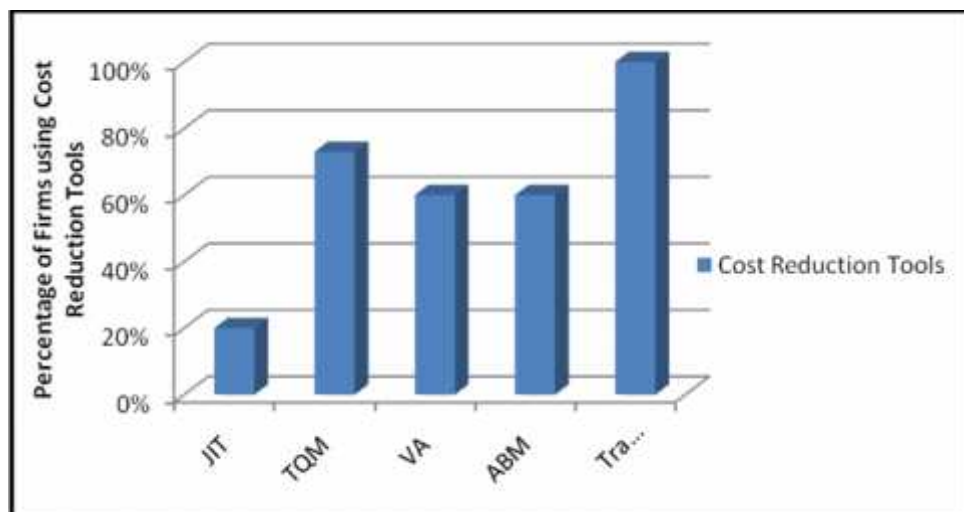
Showing Percentage of Firms using and not using Cost Reduction Tools



The above figure shows that 63% of the total firms sampled are practicing cost reduction tools where as 37% not using the tools.

Figure 4.4

Showing percentage of firms using Cost Reduction Tools by Types



The above figure shows that 20% of the firms apply JIT system. Similarly, 73% of the firms were applying TQM approach, 60% each VA and ABM. Training schemes more or less were found using by cent % of the firms sampled.

4.3 Major Findings

1. The research works have found that about 63% of the firms are practicing cost management/reduction. Out of them JIT system were found only 20% applicable by the manufacturing firms which is the lowest using tool than other. The main reason behind this is non-availability of suppliers due to various reasons like political instability, more changeable policy, strike, terrorist etc. And the firms using JIT, long term stable relationship perquisites managed for applying JIT system.
2. Research made among the firms has shown that existing cost reduction practice is different between the sectors. Training schemes are found more or less provided by all types of manufacturing firms where 67% firms provide on-the-job, 20% off-the-job & 13% both.
3. Similarly, 73% of the firms among the sample collected were applying total quality management (TQM) and rest 27% not using TQM due to lack of skilled manpower and internal failure cost. The firms applying TQM were found maintaining quality with preventive measure and addresses quality of service as well as quality of conformance.
4. About 60% of the firm's surveyed were found using value engineering approach and activity cost management approach each. The main reason behind not using of value engineering is lack of experience & expertise and behind ABM is poor organizational

culture. The research also found out the fact that most of the firms are using activity sharing & activity selection for ABM approach.

5. Similarly, cost reduction tools were not found equally applied in Nepalese manufacturing sector. Among the tools taken as study variables, training program was found widely applied. The average figure shows that 75% of the samples from Chemical/Pharmaceutical firms were practicing cost reduction, which is the highest among all the sectors. Similarly, 51% of Technical/Engineering, 50% of FBT & Electrical/Electronic each and 43% of Textile/Garment manufacturing firms were found practicing cost reduction tools.

CHAPTER- V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

When business began in the world for the first time, people were unknown about its future coverage and consequence. The rise of business and the rapid growth in the world put enough pressure upon the world economy, the result of which was the Industrial Revolution of the mid-eighteenth century. The global economic boom appeared in early 1990s. Global companies increased, transport cost decreased and the revolution was waged in the information technology. Liberalization, Privatization and the free marketing created many opportunities around the globe. The world's trend of grouping regionally clutched the South Asian countries into its grip and they formed a regional forum, called SAARC in 1985. Nepal is a member of SAARC.

After industrialization, American and European countries established multinational companies around the world in the search of materials for production works. Though they lacked raw-materials for the production works for their companies, these countries have maintained low cost of production.

Nepalese manufacturing sector has been suffering from lack of resources and their high cost. They need to think for timely cut-down of costs by taking modern cost reduction measures being applied by Japanese manufacturing organizations at present. This

research work has been done with the objective of analyzing the current status of the application of cost reduction tools in Nepalese manufacturing enterprises, and providing suggestions for the application of cost reduction tools to Nepalese manufacturing enterprises.

Cost reduction requires mass participation, wide communication and effective training within the organization and between the departments. 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, organization product planning and control, equipment and plant layout, administration, selling & distribution, finance, purchase and control of materials etc. For cost reduction, the modern Japanese tools like JIT System, TQM, ABM, Value Analysis, Training Schemes and SSS were used.

The success of Japanese firms in international markets generated interest among many Western companies to know that how this success was achieved. The implementation of just-in-time (JIT) production method was considered to be one of the major factors contributing to this success. The JIT Philosophy made famous by Toyota, which has been credited with the success of many of the worlds leading manufacturers. Tremendous cost saving has been realized by many companies that have adopted the JIT approach.

JIT means producing what is needed, when needed and no more. Anything over the minimum amount necessary is viewed as waste, because effort and material expended for something not needed now cannot be utilized now. In JIT System applied inventory management, the materials are purchased and subassemblies/products are manufactured

in small lot sizes. Excessive production at the time of less need and less production at the time of high need are avoided maintaining uniform production rate in JIT System.

In the 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 the items correctly the first time rather than wasting resources 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 in, by focusing on the causes rather than symptoms of poor quality.

As per traditional accounting approach, the share of direct costs like cost of materials, cost of labor and other direct costs are bigger than the share of overhead costs. To eliminate the shortfall in traditional accounting approach, Cooper and Kaplan jointly introduced activity based costing, shortly known as ABC. The terms Activity-Based Management (ABM) or Activity-Based Cost Management (ABCM) are used to describe the cost management application of ABC. ABM is based on the premise that activities consume costs. Therefore, by managing activities, cost will be managed in the long term. Since early 1960s, Value Analysis (VA) has emerged as a powerful technique to reduce costs. Literally, value analysis is analyzing the value of a product, service or system. The purpose of value analysis/value engineering (VA/VE) is to simplify products and processes. Its objective is to achieve equivalent or better performance at a lower cost while maintaining all functional requirements defined by the customer. VA/VE does this by identifying and eliminating unnecessary cost.

The employees as well as the managers of an organization must get training and development to enhance their efficiency timely and work effectively. Such activity is called Human Resource Development. Human Resource Development is of two things: training and development of employees. Factors like organizational plans, employee record work & workflow, employee factors like skill, attitude, etc. determine training needs. Training to the employees can be given on-the-job or off-the-job. In on-the-job training, employees are exposed to the practical works for the purpose of learning, and in off-the-job training, employees are theoretically equipped. For, effective implementation of training, training effectiveness should be appraised.

In Japan, products are highly standardized and the result is low-pricing products. Goods are produced using Assembly Line Process Technology. Automated machines are used. Goods produced at two different times from the same technology are similar. This is the main feature of standardization. Specialization refers to elimination of product variety so that the operation can be minimized which leads to use of expert knowledge, skill and techniques in production system. Simplification refers to the elimination of superfluous varieties, dimensions and works.

Manufacturing firms using the tools of cost management/reduction as described above can reduce the costs. The survey conducted over 15 manufacturing enterprises, has shown that modern cost reduction tools are principally being found applied in those firms, but no preparatory implementation has been made so far. Most of the firms claimed that they are

using the tools like TQM, ABM, Value Analysis, Training etc. Remaining other tool like JIT was found rarely.

5.2 Conclusion

Nepalese manufacturing firms mostly prefer increasing volume of sales for maximizing profit and wealth of the organization. Firms highly prefer tender purchase for the procurement of material for the purpose of lowering the operating cost and consequently the price of the products. Nepalese manufacturing firms are suffering high cost problem and requires cost reduction program in selling and distribution procedure area. The second highly suffered area from the view point of cost is production planning and control.

A JIT System is not widely practiced in Nepalese manufacturing sector. The FBT firms and Textile/Garment firms are applying JIT to some extent. But the firms from other sector are not debuting JIT system till date. The main reason behind low practice of JIT system in Nepalese manufacturing sector is non-availability of suppliers. The firms following JIT system mostly uses JIT production or manufacturing processes.

TQM is widely practiced in Nepalese manufacturing sector. In management of total quality of products, firms are taking preventive measures. Appraisal works are given some importance in FBT & Textile/Garment firms. For the application of TQM, firms are giving high value to quality of service. FBT firms have been found giving high value to quality of service where as Chemicals/Pharmaceuticals firms found giving high value to quality of conformance.

The practice of value engineering/analysis is at the satisfactory level in Nepalese manufacturing sector. Cost Analysis has been found applying by most of the firms where chemical/pharmaceutical firms mostly focusing Design Analysis.

The practices of activity-based-management in Nepalese manufacturing firms are found at satisfactory level. About 60% of the firms are being managed with activities and the most of the firms are using activity sharing for ABM program. Some of the firms are also managing activity selection.

Most of the Nepalese manufacturing firms are conducting training programs, especially, on-the-job. Apprenticeship training and job instruction training are mostly used as method of training in on-the-job. For the off-the-job Lecture/Conference is mostly used. Some firms also use Experimental exercises for off-the-job. Most of the organizations also evaluated training by observation method.

Almost all of the firms accepted that there were wastages as well as leakages in the process of manufacturing. They used different tools to control those wastages/leakages. Most of the firms used skilled & trained manpower to reduce wastages. Same ratio of firms also used re-cycle process to control wastages and eliminate loses of organizations.

5.3 Recommendations

As all know that the present condition of Nepal is very complex. Nepal is in transitional phase. The future of Nepal is uncertain. At present, there are no fixed policies of government. In this context, Nepalese manufacturing enterprises are facing various

problems like transportation, union, security etc. Nepal is also the member of WTO, BIMSTEC, SAFTA etc. For this, Nepalese manufacturing sectors need to compete with international products which are made by highly sophisticated technologies. Economics and businessmen are aware that how Nepalese manufacturers can compete with international standards. In this context, Nepalese manufacturing sector has to rethink for safeguarding their products in the national markets. Among different measures for this; cost reduction is also one of them. But the cost reduction should be accompanied by mass production and wide distribution as well. Based on the findings/conclusions of this research works, the following recommendations were forwarded for Nepalese manufacturing sector for effective cost reduction purpose.

Recommendation to Nepalese Manufacturing Enterprises

1. In context of our country, bearing high cost in all sectors is a major problem. So, modern Japanese cost management tools should be highly used. Firms have to think how to make the practice effective. For this, they have to find out each & every cause for ineffective practice and preventive measures should be taken.
2. In the present context, firms have to be given enough strength for long term stable relationship with suppliers for easy application of JIT system. Also, non-availability of suppliers which is the main cause for application of JIT should be slowly fulfilled.
3. In Nepalese manufacturing enterprises, applying condition of TQM is satisfactory but not found widely used due to internal failure cost & lack of skilled manpower .firms have to think how to control or minimize internal failure cost and how to

upgrade skills and knowledge in their manpower to work in challenging and changed context.

4. Similarly, every firm must be analyzing that value of product or service. For cent percent succession of value analysis, firms have to hire expertise and qualified manpower and manage smoothly obstacle from the work force and their unions.
5. Firms should manage the activities with cost. For better management, firms have to improve organizational culture.
6. For the smooth operation of an organization, firms should conduct training program from time to time which add more skill to the employees for work.
7. Firms should also control or minimize the waste products and stop leakages to eliminate losses. For this there are different measures such as skilled & trained manpower, re-cycle process, qualitative raw material etc.

Recommendation to Nepal Government

The knowledge about cost management/reduction in Nepalese manufacturing enterprises are found very slow i.e. enterprises have no enough knowledge about cost reduction tools. Although firms who have knowledge about this, are facing various difficulties and complexities for 100% succession i.e. no suitable environment of succession of cost reduction practice.

So, government has to think how to upgrade their knowledge about cost reduction techniques and tools and how to minimize/remove difficulties and complexities. For this, government should play partnership role by giving and upgrading knowledge and skill through seminar, discuss program etc. about this topic from time to time. Government

should also make clear and solid policies about industrial security, transportation, workers union etc. this type of policies will give a fair environment for practicing cost reduction tools and techniques.

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Questionnaire on Cost Reduction

Name of the company:

Establishment year:-

Number of Products manufactured:

Name of the Products:

Please, give tick (✓) mark for the appropriate alternative provided for each questions. The answers will be kept confidentially.

Questions

- 1) How profit-cum-wealth maximization will be possible in your company?
 - a) Increase in volume of sales ()
 - b) Increase in selling price ()
 - c) Reduction in operating cost ()
 - d) Others, if any, please specify.....
- 2) Which method of procurement of material your company is using at present?
 - a) Bargaining with the suppliers of materials ()
 - b) Tender purchase ()
 - c) Pre-negotiation at an agreed price ()
 - d) Others, if any, please specify.....
- 3) In which areas the company is suffering cost problem & requires cost reduction program?
 - a) Product design ()
 - b) Organizational operation ()
 - c) Production planning & control ()
 - d) Equipment & plant layout ()
 - e) Administration procedure ()
 - f) Selling & distribution procedure ()
 - g) Financing activities ()
 - h) Purchase of material & their control ()
 - i) Others, if any, please specify.....
- 4) Does the company use JIT system?
 - a) Yes ()
 - b) No ()
- 5) If yes, which JIT system used?
 - a) JIT Production/ Manufacturing ()
 - b) JIT Purchasing/ Zero inventory system ()
 - c) Others, if any, please specify.....
- 6) Which JIT operation is used?

- a) Long-term stable relationship ()
 - b) Simple purchaser agreements ()
 - c) Frequent delivery with small quantity ()
 - d) Others, if any, please specify.....
- 7) If JIT system has not been used in the company, what are the causes?
- a) Lack of skill & experience manpower ()
 - b) Non-availability of suppliers ()
 - c) Lack of information ()
 - d) Others, if any, please specify.....
- 8) Is the company using TQM approach?
- a) Yes ()
 - b) No ()
- 9) Which quality related cost the company is bearing presently?
- a) Prevention costs ()
 - b) Appraisal costs ()
 - c) Internal failure costs ()
 - d) External failure costs ()
- 10) Which aspect is focused in company for TQM?
- a) Quality of design ()
 - b) Quality of conformance ()
 - c) Quality of service ()
- 11) Which factor is considered for managing continual quality management?
- a) Management committee ()
 - b) Customer focus ()
 - c) Effective organization & co-ordination ()
 - d) Employee participation/ quality circles ()
 - e) Design of quality ()
 - f) Consist on target performance ()
 - g) Data-driven decision ()
 - h) Monitoring & control ()
 - i) Instill on going improvement ()
- 12) If TQM has not been applied in your company yet, what may be the reason?
- a) Lack of skilled manpower ()
 - b) Quality is not a problem ()
 - c) Lack of team spirit in the employee ()
 - d) Low employee involvement ()
 - e) Others, if any, please specify.....
- 13) Does Value Analysis is used in the company?
- a) Yes ()

b) No ()

14) If yes, which procedure the company is using?

a) Design Analysis ()

b) Cost Analysis ()

- 15) If Value Analysis is not used, what may be the reason?
- a) Lack of experience & experts ()
 - b) Lack of qualified manpower ()
 - c) Obstacle from the work force ()
 - d) Others, if any, please specify.....
- 16) Which technology process your company is using at present?
- a) Manual ()
 - b) Mechanized ()
 - c) Automated ()
 - d) Group ()
- 17) Is activity based management applied in your company?
- a) Yes ()
 - b) No ()
- 18) If yes, which technique is followed?
- a) Activity reduction ()
 - b) Activity elimination ()
 - c) Activity selection ()
 - d) Activity sharing ()
- 19) If activity based management is not used, what may be the reason?
- a) Influence of contingent activities in costs ()
 - b) Fixed non-value added activities ()
 - c) Corruptive reporting about non-value added activity ()
 - d) Fear of lay-off to the employees ()
 - e) Lack of good performance appraisal ()
 - f) Poor organizational culture ()
 - g) Lack of top management support & commitment ()
 - h) Others, if any, please specify.....
- 20) Does your company provide training to the workforce/ employees?
- a) Yes ()
 - b) No ()
- 21) If yes, which method of training is used?
- a) On-the-job ()
 - b) Off-the-job ()
- 22) For on-the-job training, which methods are used?
- a) Apprenticeship training ()
 - b) Internship training ()
 - c) Job instruction training ()
- 23) For off-the-job training, which methods are used?

- a) Lecture/ Conference ()
b) Simulation exercises ()
c) Programmed instruction ()
d) Experiential exercises ()
- 24) Which indicators are used for determining training needs?
a) Change in organizational plans ()
b) Employee records like absenteeism break of discipline, punctuality ()
c) Employee factors like experience, gender, age etc. ()
- 25) How effectiveness of training is evaluated in your company?
Using:
a) Observation method ()
b) Test-retest method ()
c) Pre-post performance method ()
d) Experimental control group method ()
e) Training surveys ()
f) Cost effectiveness analysis ()
g) Others, if any, please specify.....
- 26) If training program is not conducted, what are the reasons?
a) Only highly qualified employees are taken in the very beginning ()
b) Cost of training is higher ()
c) Qualified trainers are not available ()
d) Others, if any, please specify.....
- 27) Is there any wastage & leakage in the manufacturing process in your company?
a) Yes ()
b) No ()
- 28) What measures are being used to control those wastage & leakage?
a) Re-cycle/ re-use ()
b) Using qualitative raw material ()
c) Using skilled & trained manpower ()
d) Regular physical verification of Inventory ()
e) FIFO system ()
f) Maintain appropriate/balance temperature ()
g) Others, if any, please specify.....
- 29) Please write some lines on how your company is managing cost.
.....
.....
.....
.....

Thank you for your kind co-operation