

**A STUDY ON
PROFIT PLANNING MECHANISM OF NTC**

A THESIS

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RECOMMENDATION

This is to certify that the Thesis.

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DECLARATION

I hereby declare that the work reported in this thesis entitled “A Study On Profit Planning Mechanism of NTC”. Submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Master’s Degree in Business Study (M.B.S.) under the supervision of Prof. Dr. Kamal Deep Dhakal and Joginder Goet of Shanker Dev Campus.

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ABBREVIATIONS

C.V.	Coefficient of Variation
CB	Commercial Bank
COD	Cost of Deposit
FY	Fiscal Year
GNP	Gross National Product
JVBs	Joint Venture Banks
LDO	Loan, Discount and Overdraft
NCC	Nepal Credit & Commerce Bank Limited
NO.	Number
NRB	Nepal Rastra Bank
NTC	Nepal Telecom
OBS	Off-Balance Sheet
P.E.	Probable Error
PPC	Profit Planning and Control
PPM	Profit Planning Mechanism
RBB	Rastriya Banijya Bank
ROA	Return on Assets
Rs	Rupees
S.D.	Standard Deviation
T.U.	Tribhuvan University

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Profit is the primary measures of business success. At least, normal profit is necessary for the operations of any kind of originations. Without profit organization cannot operate its functions. Making profit is not easy because “Profits do not just happen, profits are managed. Profit is a motivating factor behind many managerial activities. Profit is financial reward. Economics theories on profit may be put in three broad categories. The first theory looks upon profit as the reward for bearing risks. The second view, profit as the consequence of friction and imperfection in the competitive adjustment of the economy to dynamic changes. Third sees profit as the reward for successful innovation. A business firm is an organization designed to make profit and profit is the primary measurement of its success. Profit can not be achieved easily. It should be managed well with better managerial skills. So profit is the planned and controlled output of management.

Planning means deciding in advance what to do in future. It is a method of thinking out acts and purpose before hand. Planning is and effective management tool for decision making. It gives direction to the decision makers as well as manager to take the proper decision. Planning is pre-determined course of action for achieving goals or objective effectively at a fluid environment within a certain period through the selection of best alternatives among the various alternatives. On the other hand, it holds accountability and responsibility about result to individual. Planning also states what, where and how things will be accomplished. An adequate planning is necessary for control of operations.

Three major function of management are planning, execution and control and these are the key elements of the management process. Business management must plan to its activities is in advance carryout the plan and institute appropriate technique of observation and reporting to insure that deviation from plans are properly analyzed and handled. In planning the manger fixes the objectives of the organization as a whole and in the light of this, the goals of the various departments of the organization. Then, he proceeds to prepare a kind of blue print mapping out the ways of attaining these objectives naturally then all other functions of the manager depend upon planning. Planning is effective management tool for decision maker as well as manager to take the proper decision.

Control is the process of ensuring that actual activities confirm to plan activities. Control helps in correction. Therefore, planning and controlling are major function of management. Controlling is the measurement and correction of performance in order to make sure that enterprise objective and the plans devised to attain them are accomplished. Control provides timely information that may prompt the revision of goals. The purpose of control is achieved with setting standards comparing predicted and actual results against these standards and taking correctives actions.

Profit, planning and control are an important approach, mainly in profit oriented enterprises. Profit planning is nearly a tool of management, which is used to plan and control business operation and interaction. Profit planning and control is a new term in the literature of business. Though, it is a new term, it is not a new concept in the management. It is also known as comprehensive budgeting. It can be defined as a management planning covering all phase of profit operation for a definite future period. A project planning is a formal expression of policy, plan, objectives and goals established by manager for the concern as a whole as for each sub-division.

Profit planning and control cannot be through as a separate technique. It cannot be operated in dependently of the total management process. It is integration in different managerial approach and technique such as sales forecasting. Production planning and control, inventory control also focus on performance reporting and evaluation of performance to determine the causes of both high and low performance.

The Profit planning and control includes;

- Development and application of board and long-range objectives of the enterprises.
- Specification of enterprise goals.
- Development of a Strategic long-range profit plan detailed by assigned responsibilities.
- Establishment of a system performance report detailed by assigned responsibilities.
- Development of follow up procedure.

1.2 Introduction of Nepal Telecom (NTC)

In Nepal, operating any form of telecommunication service dates back to 94 years in B.S. 1970. But formally telecom service was provided mainly after the establishment of MOHAN AKASHWANI in B.S. 2005. Later as per the plan formulated in First National Five year plan (2012-2017); Telecommunication Department was established in B. S. 2016. To modernize the telecommunications services and to expand the services, during third five-year plan (2023-2028), Telecommunication Department was converted into Telecommunications Development Board in B.S. 2026. After the enactment of Communications Corporation Act 2028, it was formally established as fully owned Government Corporation called Nepal Telecommunications Corporation in B.S. 2032 for the purpose of providing telecommunications services to Nepalese People. After serving the nation for 29 years with great

pride and a sense of accomplishment, Nepal Telecommunication Corporation was transformed into Nepal Doorsanchar Company Limited from Baisakh 1, 2061. Nepal Doorsanchar Company Limited is a company registered under the companies Act 2053. However the company is known to the general public by the brand name Nepal Telecom as registered trademark.

Nepal Telecom has always put its endeavors in providing its valued customers a quality service since its inception. To achieve this goal, technologies best meeting the interest of its customers has always been selected. The nationwide reach of the organization, from urban areas to the economically non- viable most remote locations, is the result of all these efforts that makes this organization different from others.

Definitely Nepal Telecom's widespread reach will assist in the socio-economic development of the urban as well as rural areas, as telecommunications is one of the most important infrastructures required for development. Accordingly in the era of globalization, it is felt that milestones and achievements of the past are not adequate enough to catch up with the global trend in the development of telecommunication sector and the growth of telecommunication services in the country will be guided by Technology, Declining equipment prices, market growth due to increase in standard of life and finally by healthy competition.

Converting NT from government owned Monopoly Company to private owned, business oriented, customer focused company in a competitive environment, Nepal Telecom invites its all-probable shareholders in the sacred work of nation building.

1.3 Statement of the Problems

Public enterprises are created for infrastructure development, to generate surplus for self expansion of their service and to contribute for national revenue. So it is complicated to assess the efficiency of Public enterprise with their socio-economic development goals. Public enterprise has to be efficient in

the utilization of resources. Hence, organization must assess its financial health.

As most of the industries depend heavily upon the external and internal information, industrialization without telecommunication development is difficult to imagine. Till the present, there is overwhelming demands of Nepal Telecom services, as it does have a little market competition. Despite this fact, the profit of Nepal Telecom is not satisfactory. On the other hand the organization is going to issue its share to the public. Regarding its net profit, NTC is successful public enterprises because it is operating at profit over the studied period. But net profit is not only the parameter of measuring the effective financial position. Even when the profit is in increasing trend, there may have some weakness. Profit on NTC in relation with investment is low. Low utilization of resources and problem of receivable management is the serious problem of NTC. The operating expenses of NTC have been increasing each year.

NTC has not been able to generate the required funds to operate its activities too. In each fiscal year, it has been taking huge amount of loan, grant and donation from foreign government and donator agencies. It shows the internal inefficiency of NTC. So, this research has tried to highlight the financial problems of this corporation.

The matter of financial performance of Nepal Telecom holds keen interest to the stakeholders. In this context, the study primarily focuses on the financial obligation, profit planning capacity utilization etc. So, the present research tried to solve the following research questions.

- What are sources of profit of Nepal Telecom?
- Is capacity utilization in Nepal Telecom is efficient?
- What is the financial position of Nepal Telecom?
- How profit planning mechanism is used by Nepal Telecom?

1.4 Objectives of the Study

The main objective of this study is to examine the present comprehensive profit planning mechanism applied by NTC. The main objective is to assess the strengths and weaknesses of Nepal Telecom. The specific objectives are as follows.

- To analyze the sources of revenue of NTC
- To analysis the targeted and actual budget of NTC.
- To analysis the profit planning tools used by NTC.
- To provide appropriate suggestions.

1.5 Significance of the Study

Nepal Telecom is an enterprise of great national concern. As it is going to be privatizing in nearest future in competitive business environment, concerned parties are looking over its performance with great interest. As a private enterprise it has the obligation of socio-economic development as well, so study of profit planning of leading telecom service provider in the nation will be important for the following group and individuals.

- Present and perspective customers
- Present and perspective investors
- Policy making authority
- Further researchers
- Government
- ICT based companies

1.6 Limitations of the Study

The study has the following limitations.

- Secondary data are collected from annual reports of the concerned enterprises.
- The study makes the analysis of profit planning mechanism of Nepal Telecom. IT may not be applicable to any other enterprise.
- The study covers the period of five years form 2066/067 to 2070/071.
- The comprehensive and accuracy of the study is based on the data available from the management of organizations and other sources.
- As the data used are mainly secondary in nature, there may be the chances of error in such data.
- This study is concentrated in accounting and financial aspects only.

1.7 Organization of the Study

This study is divided into five separate chapters.

Chapter I- Introduction

This chapter contains the brief introduction of the subject matter i.e. background of the study, statement of the problem, objectives of the study need & Significance of the study, limitation of the study & Organization of the study.

Chapter – II: Conceptual Framework & Review of Literature

The second chapter includes pilot studies and textual concepts with regard to conceptual framework on Budgeting, Profit Planning along with the review of major books, journal, research work and previous theses.

Chapter – III: Research Methodology

The third chapter includes research design, population & sample, sources and types of data, data processing technique and method & tools of data analysis.

Chapter – IV: Presentation & Analysis of Data

The fourth chapter deals with the presentation and analysis of data. It analyzed the data and interprets the results using different accounting and statistical tools, table, chart and graphs. It also includes major findings of the study.

Chapter – V: Summary, Conclusions & Recommendations

This chapter contains Summary, Conclusions and Recommendation. This chapter briefly represents the summary of the whole study and the conclusions and the recommendations for the effective and smooth running of the NTC under the study.

Besides these, bibliography and annexure are presented at the end of the thesis. Similarly acknowledgements, table of contents, list of tables, list of figures, abbreviations are included in the front part of the thesis report.

CHAPTER II

CONCEPTUAL FRAMEWORK & REVIEW OF LITERATURE

This chapter is concerned with review of literature relevant to the topic Profit planning mechanism of NTC. The purpose of reviewing of literature is to develop some expertise in one's area, to see what new contribution has made and to receive some ideas for developing a research design. Thus, previous studies cannot be ignoring as they provide the foundation of the present study. This chapter highlights the literature that is available in concerned subject as to my knowledge, research work, and relevant study on this topic, review of journals and articles and review of thesis work performed previously.

2.1 Conceptual Framework

It is a part of review of literature. In this framework of decision about theoretical review from text books, reference books and practice in profit planning and control are considered.

2.1.1 Fundamental concept of profit planning and control

In modern-day businesses except in very small companies, it is virtually impossible for the top manager to have firsthand knowledge of all the relevant factors operating throughout a business. Nor can a single lower-level manager be expected to have the range of knowledge, experience and competence to make all the decisions for the large segments of a company, either as a source of reliable information or as a participant in decision-making. The quality of the judgments of the total management effort will continue to distinguish the better- managed and more successful companies. Profit planning and control is the tool that is used to increase significantly the effectiveness of a management

and to place managerial judgments on a more objective and informed foundation.

Managing in fact implies co-ordination and control of the total enterprise efforts to achieve the organizational objectives. The process of managing is facilitated when management charts its course of action in advance. The function of management includes decision-making facilitated by various managerial techniques, procedures and by utilizing the individual and group efforts in a co-coordinated and rational way. Profit planning is one of the systematic approaches for attaining effective management performance. Profit planning is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. The profit planning control means the development and acceptance of objectives and goals and moving an organization efficiently to achieve the objectives and goals. It is a tool that may be used by the management in planning the future course of action and in controlling the actual performance.

Profit planning is merely a tool of management; it is not an end of management or substitute of management. It is strictly an internal affair; it should not be made public. Profit planning and control provide guidelines to management and it acts as signal light for the management and enables the management to correct its policy.

Koontz and Donnell have given emphasis on planning and control function of management. The role of management on profit planning and control has been defined and the assumption that management can plan and control long term destiny of an organization through perfect decision making process. In favor of planning and control economist and the management experts have said that planning means prosperity and unplanned means happenstance. So, a modern management expert has given more importance to profit planning and control.

Profit planning and control has been regarded as a basis for perfect decision-making.

Profit planning and control also known as comprehensive profit planning and control is a new term in the literature of business though it is a new term but it is not a new concept in the management. Comprehensive profit planning and control or PPC on other terms are business budgeting, managerial budgeting and budgeting. It is an integral part of management. Profit plan is a financial and narrative expression of the expected results from the planning decisions. It is called the profit plan (or the budget) because it explicitly states the goals in terms of time expectations and expected financial results (return on investment, profit, and cost) for each major segments of the entity. Typical profit plans establish the content and format of the internal –control reports with respect to operations, inputs, outputs and financial position developed by the entity for monthly performance reporting to the various levels of management (Welsch, et al., 2000: 121).

Profit planning in fact is a managerial technique and is such a written plan in which all aspects of business organization with respect to definite future period are included. It is a formal statement of policy; plan objective and goal established by the top management in respect of some future period. Profit plan is a pre-determined detailed of plan action developed and distributed as guide to current operation and as a partial basis for the subsequent evaluation of performance. Thus, we can say that profit plan is a tool, which may be used by management in planning the future course action and in controlling the actual performance (Gupta, 1992: 91).

The fundamental concept of PPC includes the underlying activities of tasks that must generally be carried out to attain maximum usefulness from PPC.

- A management process that includes planning, organizing, staffing, leading and controlling.

- A managerial commitment to effective management participation by all level in the entity.
- An organization structure that clearly specifies assignments of management authority and responsibility at all organization levels.
- A management planning process.
- A management control process.
- A continuous and consistent coordination of all the management functions.
- Continuous feed forward, feedback, follow-up and replanning through defined communication channels (both downward and upward).
- A strategic profit plan.
- A tactical plan.
- A responsibility accounting system.
- A continuous use of the exception principle.
- A behavioral management program (Gupta, 1992: 93)

2.1.2 Basic elements of profit planning and control

The basic elements of profit planning are as follows.

- Comprehensive and co-ordinate plan: The profit planning considers all activities and operations of an organization. The budgets prepared by different departments inside an organization are compiled. So, before preparing a profit planning firstly all the budgets prepared by departments have to be compiled to form comprehensive profit planning.
- It is expressed in financial terms: All activities covered by budgets are related with funds. Therefore the budget has to be expressed in money units i.e. in rupees, dollars, pounds etc.
- Plan for firm's operating and resources of budget: It is a mechanization to plan for the firm's all operations or activities. The two aspects of

every operation are revenue and expenses. The budgets must plan for quantity, revenue and expenses related to specific operations. Planning should not be done for revenue and expenses only. The plan should be made to carry out the operations. The planning for resources will include planning assets and sources of funds.

- Plan for specific periods: Time dimension must be added in a budget. A budget is meaningful only when it is related to a specific time. The budget estimates will be relevant only for some specific period (Dangol & Prajapati, 2001: 131).

2.1.3 Foundation for PPC

An enterprise has to take some major steps to establish a sound foundation for initiating a profit planning and control program. These steps are as follows (Welsch, et al., 2000: 151).

Step-1: there must be strong commitments by the top management to the broad concept of profit planning and control and a sophisticated understanding of its implications and operations.

Step-2: the characteristics of the enterprise and the environment in which it operates – including the controllable and non-controllable variables- must be identified and evaluated so that relevant decisions may be made about the characteristics of a profit planning and control program that would be effective and practical.

Step-3: there should be an evaluation of the organizational structure and assignment of managerial responsibilities and implementation of changes deemed necessary for effective planning and control.

Step-4: there must be an evaluation and reorganization of the accounting system to ensure that it is tailored to the organizational responsibilities so that it can provide data particularly useful for planning and control purposes.

Step-5: a policy determination must be made about the time dimensions to be used for profit planning and control purposes. (i.e. long range, medium range and short range)

Step-6: a program of budget education should be developed to inform management at all levels about (a) the purposes of the program; (b) the manner in which it will operate, including the basic management policies and guidelines for its administration; (c) the responsibility of each level of a management in the program; and (d) the ways in which the program can facilitate the performance of each manager's functions.

2.1.4 Activities Involved in PPC

Profit planning has the ultimate objectives of attaining the optimum profit as indicated by many successful applications. The most reasonable approach to attain the optimum profit is to plan as a percentage of capital employed to produce them and to manage the enterprise with the objective of achieving the planned percentage. It is the heart of management with proper planning. Profit will not just happen thus every enterprise should be systematically planned for profit and control over them. Profit planning in fact is management technique and a profit

plan is such a written plan in which objectives and goal established by the top management in respect of some future period plan of action development and distributed as a guide to current operations and as a partial basis for the subsequent evaluation (Gupta, 1992: 119).

The following are the activities involved in PPC.

- Development and applications of broad and long range objectives of the enterprise.
- Specification of enterprise goals.
- Development of a storage long- range profit plan in broad terms.

- Specification of a tactical short- range profit plan detailed by assigned responsibilities (division, department and project).
- Establishment of a system of periodic performance reports detailed by assigned responsibilities.
- Development of follow up procedures.

2.1.5 Application of PPC

Some people say that comprehensive profit planning and control is applicable only to large and complex organizations. Comments like “comprehensive budgeting is a fine idea for most businesses, but ours is different,” or “it is impossible to project our revenues and expenses,” and so on. Such type of comments are common regarding non-manufacturing enterprises, service companies, financial institutions, hospitals certain retail business, construction companies, and real estate enterprises. To the contrary, profit planning and control can be adapted to any organization (profit or non-profit, service or manufacturing), regardless of size, special circumstances, or conditions. The fact that a company has peculiar circumstances or critical problems is frequently a good reason for the adoption of certain profit planning and control procedures. In respect to size, when operations are extensive enough to require more than one or two supervisory personnel, there is a need of profit planning and control applications. The smallest company certainly has different needs in this respect than a large one. As with accounting, a single profit planning and control system that is appropriate for all enterprise cannot be designed. A profit planning and control system must be tailored to fit the particular enterprise, and it must be continually adapted as the enterprise and its environment change (Fago, 2003: 71).

2.1.6 Importance of PPC

A profit planning and control program helps the management perform its planning function by developing a strategic and tactical profit plan. It helps

management perform its control function by providing realistic goals and standards. It emphasized on developing positive reinforcement, improving motivation, developing goals, coping with the effects of budgetary pressure, resolving budget padding problems and using budgets for control. The following points show the importance of PPC (Bajravhrya, et al., 2004: 97).

- It forces early consideration of basic policies.
- It requires adequate and sound organization structure; that is, there must be a definite assignment of responsibility for each function of the enterprise.
- It compels all members of management, from the top down, to participate in the establishment of goals and plans.
- It compels departmental managers to make plans in harmony with the plans of other departments and of the entire enterprise.
- It requires adequate and appropriate historical accounting data.
- It requires that management put down in figures what is necessary for satisfactory performance.
- It compels management to plan for the most economical use of labor, material and capital.
- It instills at all level of management the habit of timely, careful, and adequate consideration of the relevant factors before reaching important decisions.
- It reduces cost by increasing the span of control because fewer supervisors are needed.
- It frees executives from many day-to-day internal problems through predetermined policies and clear- cut authority relationships. It thereby provides more executive time for planning and creative thinking.
- It tends to remove the cloud of uncertainty that exists in many organizations, especially among the lower levels of management, relative to basic policies and enterprise objectives.
- It pinpoints efficiency and inefficiency.

- It promotes understanding among members of management of their co-workers' problems.
- It forces a periodic self-analysis of the company.
- It forces management to give adequate attention to the effect of general business conditions.
- It aids in obtaining bank credit; banks commonly require projections of future operations and cash flows to support large loans.
- It checks progress or lack of progress toward the objectives of the enterprise.
- It forces recognition and corrective action (including rewards).
- It rewards high performance and seeks to correct unfavorable performance.
- It forces management to consider expected future trends and conditions.

2.1.7 Problems of PPC

Although PPC has lot of importance and usefulness it is not a full proof concept. It has some problems. The following are the major problems of PPC (Bajrachrya, et al., 2004: 105).

- It is difficult, if not impossible, to estimate revenues and expenses realistically.
- Management has no interest in all the estimates and schedules.
- It is not realistic to write out the distribution of the goals, policies, and guidelines to all the supervisors.
- Budgeting places too great a demand on management time, especially to revise budgets constantly. Too much paper work is required.
- It takes away management flexibility.
- It creates all kinds of behavioral problems.
- It places the management in a straitjacket.
- It adds a level of complexity that is not needed.

- It is too costly, aside from management time.
- The managers, supervisors and other employees hate budgets.

2.1.8 Limitations of PPC

Apart from its importance and problems of PPC it has certain limitations that should be taken into consideration by the management. The followings are the critical features of PPC (Kaplan & Atkinson, 1998: 137).

- **The profit plan is based on estimates:** The advantage and disadvantages of a profit- planning program depend to a large extent on the realism with which the basic estimates are made. Estimates must be based on all available facts and sound managerial judgment. Estimating sales and expenses cannot be an exact science; however, numerous mathematical, statistical and other techniques can be applied to these problems to produce realistic results.
- **A profit planning and control program must be continually adapted to fit changing circumstances:** A comprehensive budget program cannot be started and perfected in a short time. Profit planning and control techniques must continually be adapted, not only for each particular enterprise but for changing conditions within the enterprise. Continuous budget education is necessary, especially during the formative period.
- **Execution of a profit plan will not occur automatically:** Profit plan will be effective only if all responsible executives exert continuous and aggressive efforts toward their accomplishment. All levels of management must understand the program, must be convinced of its relevance to their function, and must participate in its implementation in an appropriate way.
- **The profit plan is not a substitute for management:** Profit planning cannot substitute for enlightened management. It is a system that can aid in performing the management process. The profit plan should be

regarded not as a master, but as a servant. It is one of the best tools yet devised for advancing the affairs of a company and the individuals in their various spheres of managerial activity.

2.1.9 Types of Planning

2.1.9.1 Long Range Planning

Long range planning is such type of planning which covers a period of five to ten years depending upon the size and nature of enterprises. Long range planning is most important basically for broad and long living enterprises. Peter Drucker says that long range planning decisions systematically and with the best, possible knowledge of their futurity, organizing systematically the efforts needed to carry out these decisions and measuring the results of those decisions against the expectation through organized, systematic feedback" (Drucker, 1997: 161).

The objectives of long range planning are as follows.

- To provide a clear picture of whether the enterprises is handed
- To keep enterprise strong
- To focus on long range opportunities
- To evaluate management personnel
- To expenditure new financing

2.1.9.2 Medium Term Planning

Medium term planning is such type of planning which covers two or three years of period. This type of planning is to establish interim objective between long range goals and for use in the development of annual program and budget. In these causes, target with specific results and definite time tables must be developed. it is used mainly to determine the allocation of resources among competing activities and revised long ranged plans in view of more recent

developments. Medium range planning after takes form of budgeting in which each divisions, department or units is allocated certain resources during the coming year. Medium term planning most correctly predicts general levels of economic activities. Since that affects such factors as revenues profit, costs and expenditures. More detail is involved in it than with short range but less than for long-range plans. While resources allocation in important final approval will only be required for the short-range and a consideration of alternatives is still possible (Drucker, 1997: 163).

2.1.9.3 Short Range Planning

The short range planning is such a planning, which is within one year of period. The short range planning is selected to conform to fiscal quarters or one year. Because of the practice needed for conforming plans to accounting periods, short range planning concerned with limited period. Usually it covers one-year time. The management uses it as substantial part of long range and medium range plan.

2.1.10 Control System

Control means by which a variable quantity or set of variable quantities is made to conform to a prescribed norm. It either holds the values of the controlled quantities constant or causes them to vary in a prescribed way. A control system may be operated by electricity, by mechanical means, by fluid pressure (liquid or gas), or by a combination of means. When a computer is involved in the control circuit, it is usually more convenient to operate all of the control systems electrically, although intermixtures are fairly common.

There are various cases in industrial control practice in which theoretical automatic control methods are not yet sufficiently advanced to design an automatic control system or completely to predict its effects. This situation is true of the very large, highly interconnected systems such as occur in many

industrial plants. In this case, operations research, a mathematical technique for evaluating possible procedures in a given situation, can be of value.

In determining the actual physical control system to be installed in an industrial plant, the instrumentation or control-system engineer has a wide range of possible equipment and methods to use. He may choose to use a set of analogue-type instruments, those that use a continuously varying physical representation of the signal involved—i.e., a current, a voltage, or an air pressure. Devices built to handle such signals, generally called conventional devices, are capable of receiving only one input signal and delivering one output correction. Hence they are usually considered single-loop systems, and the total control system is built up of a collection of such devices. Analogue-type computers are available that can consider several variables at once for more complex control functions. These are very specific in their applications, however, and thus are not commonly used.

The number of control devices added to an industrial plant may vary widely from plant to plant. They may comprise only a few instruments that are used mainly as indicators of plant-operating conditions. The operator is thus made aware of off-normal conditions and he himself manually adjusts such plant operational devices as valves and speed regulators to maintain control. On the other hand, there may be devices of sufficient quantity and complexity so that nearly all the possible occurrences may be covered by a control-system action ensuring automatic control of any foreseeable failure or upset and thus making possible unattended control of the process.

With the development of very reliable models in the late 1960s, digital computers quickly became popular elements of industrial-plant-control systems. Computers are applied to industrial control problems in three ways: for supervisory or optimizing control; direct digital control; and hierarchy control.

In supervisory or optimizing control the computer operates in an external or secondary capacity, changing the set points in the primary plant-control system either directly or through manual intervention. A chemical process, for example, may take place in a vat the temperature of which is thermostatically regulated. For various reasons, the supervisory control system might intervene to reset the thermostat to a different level. The task of supervisory control is thus to “trim” the plant operation, thereby lowering costs or increasing production. Though the overall potential for gain from supervisory control is sharply limited, a malfunction of the computer cannot adversely affect the plant.

In direct-digital control a single digital computer replaces a group of single-loop analogue controllers. Its greater computational ability makes the substitution possible and also permits the application of more complex advanced-control techniques.

Hierarchy control attempts to apply computers to all the plant-control situations simultaneously. As such, it requires the most advanced computers and most sophisticated automatic-control devices to integrate the plant operation at every level from top-management decision to the movement of a valve.

The advantage offered by the digital computer over the conventional control system described earlier, costs being equal, is that the computer can be programmed readily to carry out a wide variety of separate tasks. In addition, it is fairly easy to change the program so as to carry out a new or revised set of tasks should the nature of the process change or the previously proposed system prove to be inadequate for the proposed task. With digital computers, this can usually be done with no change to the physical equipment of the control system. For the conventional control case, some of the physical hardware apparatus of the control system must be replaced in order to achieve new functions or new implementations of them.

Control systems have become a major component of the automation of production lines in modern factories. Automation began in the late 1940s with the development of the transfer machine, a mechanical device for moving and positioning large objects on a production line (e.g., partly finished automobile engine blocks). These early machines had no feedback control as described above. Instead, manual intervention was required for any final adjustment of position or other corrective action necessary. Because of their large size and cost, long production runs were necessary to justify the use of transfer machines.

The need to reduce the high labor content of manufactured goods, the requirement to handle much smaller production runs, the desire to gain increased accuracy of manufacture, combined with the need for sophisticated tests of the product during manufacture, have resulted in the recent development of computerized production monitors, testing devices, and feedback-controlled production robots. The programmability of the digital computer to handle a wide range of tasks along with the capability of rapid change to a new program has made it invaluable for these purposes. Similarly, the need to compensate for the effect of tool wear and other variations in automatic machining operations has required the institution of a feedback control of tool positioning and cutting rate in place of the formerly used direct mechanical motion. Again, the result is a more accurately finished final product with less chance for tool or manufacturing machine damage.

2.1.11 Budgeting as Tools for PPC

Budget planning is one of the methods used for planning, coordinating and control of activities of an enterprise. The budget is a technique for comparing various alternatives in terms of results and costs. It forces consideration of all possibilities as to the directions in which the effort of an organization should be applied. Budgeting is the heart of the business decision. It involves objectives and compares the means of reaching them.

Budgeting has long been recognized as the accepted procedure for profit planning and many of the most successful companies have applied it to good effect over a period of years. Budgeting as a tool of planning and control is closely related to the broader systems of planning and control in an organization. It serves as a guide to conduct operations and a basis for evaluating actual results.

Budget as tools of management are an integral part of the broader system of planning and control. One of the primary objects of an annual budget is to measure the profit expectations for the next financial year with due regards to all the circumstances that can influence the trading prospects. Profits do not emerge of their own accord. They have to be influenced by management. The quality of management is often judged by the size of the profit figures at the end of the financial year. For its own protection and in the interest of business, management must plan to make profit and the accepted basis for this is the annual budget, properly supported by long-term strategic planning and operation planning.

Profit planning is a heart of management and budgeting is sole appropriate technique for this most for the Nepalese PEC have been suffering the problem of poor performance and sometimes losses also. Functional budget are the tools for planning and controlling the profit of any enterprise. In budgeting, we plan the desired profit and in the time of execution the performance is verified and controlled by the budget. “Budgeting as a tool of planning and control is closely related to the broader system of planning in any organization will pursue and the fundamental policies that will guide it. In operational term budgeting involves four steps.

- Setting the objectives
- Specify the goals
- Laying down the strategies
- Preparation of budgets & profit plans (Khan & Jain, 2003: 92).

A budget is a realistic statement of income and cost objective for a year. It is a plan against which ensuring actual performance is compared to achievement and control by detecting and correcting off standards. A budget is a detailed quantitative plan to guide its operations in the planning organizing and controlling all the financial operating activities of the firms in the forthcoming period. Thus, the primary purpose of budgeting is profit planning and control and in this connection it is concerned with every aspect and every activity of a business. The essence of the accurate budgeting is to be used to the events and for this reason it is unusual to operate through an annual budget as the ideal project. There is the further aspect that the performance of companies is judged by the annual accounts and it follows that management should focus its profit aims on the same period. There are two distinct stage of budgeting: first the formulation of the plan and the means of achieving them and second the translation of these plans into financial term and preparing a profit budget and balance sheet. Such that, the first stage is generally a function of line management and the second is an accounting function (Lynch & Williams, 1999: 117).

2.1.12 Development of Profit Plan

2.1.12.1 Sales Forecasting and Sales Planning

At first, people think the sales planning and sales forecasting are same. But the sales planning and forecasting are quite different. “Sales forecasting is not a plan, rather it is a statement and or a quantified assessment of future conditions about a particular subject based on one or more explicit assumptions. A forecast should always state the assumption upon which it is based. A forecast should be viewed as only one input for the development of sales plan. The management of the company may accept, modify or reject the forecast. In contrast, a sales plan incorporates the management decisions that are based on the forecast, other inputs and management judgment about such related items as sales volume, prices, sales, efforts, production and financing. It is converted

to a sales plan when management has brought to bear on its judgment, planned strategies, commitment of resources and the managerial commitment to aggressive action to attain sales goal” (Goet, et al. 2003: 81).

2.1.12.2 Production Budget

Production budget is the projection of production of goods for specified periods. It has a very important role in planning, coordinating and control on comprehensive profit plan and control. Developments of production plan require the conversion of sales plan into production plans. It should also consider the estimation of future sales and inventory policies. Production planning is the matter of concern for only manufacturing organizations. The production plan specifies the planned volume of each product to be produced for each time period throughout the planning period. This entails the development of policies about efficient production level, use of productive facilities and inventory levels. It can be presented in equation.

Production Requirement = Sales Volume + Inventory

The main purpose of production plan is to bring balance between the sales, inventory and production. So that firm does not suffer from cost of carrying and cost of not carrying inventory, opportunities cost and stock is run out cost. “The production budget is the initial step in budgeting manufacturing operations. In addition to the production budget, three other principal budgets are relevant to manufacturing.

- Direct material and purchase component budget: It specifies the planned material and component requirement.
- Labor Budget: It shows the planned quantity and cost of direct labor.
- Manufacturing expenses or factory overhead budget: It includes the plans to all factories, costs other than direct material and labor.

To plan production effectively, the manufacturing operations are necessary for each product. The manager should develop information about the use and output capacities of each manufacturing department. The manager must provide historical data about production units, cost and the availability of resources. Production planning responsibility rests directly upon the production managers to management policies must be considered in such matters as inventory levels, stability of production and capital addition with respect to production planning, the manager must plan an optimum coordination between sale, inventory and production levels (Gupta, 1997: 99).

2.1.12.3 Material Purchase Budget

The purchase budget specifies the estimated quantities to be purchased and the estimated cost for each raw material and the required delivery dates. The material and part budget provides the purchasing manager with the data responsibility for preparing a detail plan of purpose. It is direct responsibility of purchasing manager to be knowledge about the market for items that must be purchased, and to plan the unit cost for use in the purchased and amount to purchase materials. The purchase budget is directly concerned with the timing of actual receipt of raw material rather than with the timing of usage or purchase orders. The purchase manager orderly maintains the time of purchase materials and inventory requirement by material.

2.1.12.4 Direct Labor Budget

It deals the planned direct labor requirements necessary to produce the type and quantities of outputs planned in the production budget. The main objectives of direct labor budget are assessing labor requirements, prepare manpower planning, estimate per unit labor cost, estimate cash budget, control labor budgets etc.

Effective planning and systematic control of labor costs are essential for planning and controlling labor costs involves major and complex problem are;

- Personnel needs
- Recruitment
- Training
- Job description and evaluation
- Performance measurement
- Union negotiations
- Wages and salary administration

Labor costs include all expenditure for employee from top executives to unskilled labor. To plan and control labor costs effectively the different types of labor costs must be separately considered. DLC includes the wage paid to employees who work directly on specific product. While indirect labor costs refers to the costs of other employees who do not work directly on the product. The responsibility for preparing the direct labor budget should be assigned to the executive responsible for the production function.

Approaches: The approach used to develop the direct labor budget depends as follows.

- Method of wage payment
- Type of production processes involved
- Availability of standard labor hours
- Adequacy of the cost accounting records relating to DLC

Basically, three approaches are used to develop the direct labor budget.

- Estimate the standard DLH required for each unit of each product, and then estimates the average wage rates by department, cost center or operation.
- Estimate ratios of DLC to some measure of output that can be planned realistically.

- Develop personnel tables by enumerating personnel requirements for direct labor in each responsibility center.

Here, the primary elements of control of DLC are Day to day attention to such costs and Performance reporting and evaluation of results (Horngreen, et al., 1999: 103).

2.1.12.5 Capital Budget

“Capital budgeting is the process of planning and controlling the strategic (long term) and tactical (short term) expenditures for expansion and contraction of investments in operating fixed assets” (Welsch, et al., 2000: 111).

Capital budgeting’s the planning of expenditure whose returns stretch the beyond a one- year time interval. It is the process of deciding whether or not to commit resources to a project whose benefits would be spread over several time periods. The investment decisions are commonly known as capital budgeting. Capital budget means planning for capital expenditure in acquisition of capital assets such as new building, new machinery or new project as a whole. Thus, the capital budgeting involves following steps:

- Consideration of investment proposal including alternatives.
- Application of profits, cash flows and analysis of cost benefit of the project.
- Estimation of available funds and utilization of funds. The objective is to maximize the profits with the utilization of available funds.

A capital budgeting is useful to earn future revenues organization and to reduce future a cost, capital expenditures includes such as fixed assets as property, plant, equipment, major renovation and potential. The main responsibility of capital budget lies on top executives or executive management and departmental managers. The organization capital budgeting for planning and controlling purpose can be as follows.

- To avoid excess capacity.
- To avoid ideal operating capacity.
- To avoid investment in capacity that will earn less than an adequate return as the invested amount.
- To keep evaluate alternative capital expenditure etc.

2.1.12.6 Cash Budget

It is an effective way to plan and control the cash flows, assess cash needs and effectively use excess cash. The planning and controlling of cash flows focused on cash inflows, cash outflow and the related financing. Cash budgeting is an attractive way to plan and control the cash flows assets; cash needs and effectively use excess with. Therefore, cash management is important in both large and small enterprises, planning and controlling of cash includes right quality of money, right source of money, right time for solve money, right quality for liquidity and right costs of capital.

A comprehensive PPC program establishes the foundation for a realistic budget. Cash budget shows the planned cash inflows, outflow and ending position by interim periods for a specific time span. Most companies should develop both long term and short term plans about their cash flows. A cash budget basically includes two parts.

- The planned cash receipts (inflows) and,
- The planned beginning and ending cash position for the budget period and this will indicate.

The need for investments planning is to put excess cash to profitable use. The primary purposes of cash budgets are as follows.

- Give the probable cash position at the end of each period
- Identify cash excess organization shortage by time periods.

- Establish the need for financing and or the availability of idle cash for investment.
- Establishing a sound basis for continuous monitoring of the cash position (Welsch, et al., 2000: 168).

Preparation of the cash budget should be the responsibility of the company treasurer. The cash budget is a forecast of expected cash receipts and payments for a future period. Cash forecast precedes a cash budget. The cash budget consists of three parts.

- Estimates of cash receipts
- Estimates of cash disbursement and
- Cash balances each month of budget periods

Cash budget may be done daily, weekly or monthly basis. The period and frequency of cash budget generally depends upon the size of the firms and philosophy of management. The cash budget can be prepared by two approaches (a) The cash receipt and cash disbursement approach organization (b) The financial accounting approach.

Now, the cash receipt and disbursement approach basically involves the use of detailed data from the budgeted cash amount. Financial statement approach states with net income, which is adjusted to a cash basis to compute cash flow from continuing operations. The remaining cash sources and uses must be determined by using data from various budgets already prepared. The cash receipt and disbursements approach is usually used for the tactical short-term plan because it provides more details. The financial statement method is usually used for broad analysis of the cash position and for strategic long range planning.

2.1.13 The Concept Integrated with Profit Planning

2.1.13.1 Cost Volume Profit Analysis

Cost volume profit analysis is a tool to show the relationship between these ingredients of profit planning. It is an analytical technique for studying the behaviour of profit in response to the changes in volume, cost, prices and profit. It helps to determine the minimum scales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. It is very much an extension or even a part of marginal costing.

“Contribution analysis involves a series of analytical technique used to determine and evaluate the effects on profits of changes in sales volume (i.e. units sold), sales prices, fixed costs and variables cost. It focuses on contribution margin, which is sales revenue minus total variable costs” (Welsch, et al., 200: 161).

The income statement is based on a contribution margin approach and contribution margin is equivalent to revenue minus variable cost. It will change if any one of the following variable changes i.e. volume of sale units, sales price and variable cost ratio.

2.1.13.2 Break Even Analysis

“Cost volume profit analysis includes both contribution analysis and break even analysis. BE analysis uses the same concepts as contribution analysis, however, it emphasizes the level of output or productive activity at which sales revenue exactly totals costs i.e. there is no profit or loss. Break even analysis rests upon the foundation of cost variability separate identification and measurement of the fixed and variable components of cost” (Munankarmi, 2003: 76).

Break-even analysis is the analysis of the relationship among the three must concerned factors of business, the cost, volume and profit. It provides basic

information that is necessary for product pricing, cost planning, sales volume planning and profit planning.

2.1.13.3 Zero Base Budgeting

Under zero budgeting, every budget is constructed as the promise that every activity in the budget must be justified. ZBB defines as an operative planning and budgeting process which require each manager to justify his entire budget in detail from search and shifts the burden of responsibility of each manger to justify when he should spend any money at all. It envisages a review of the total expenditure with a view to justify his entire budget. The entire program is reviewed and justified from zero base. It involves three phase of management planning, budgeting and review. Traditional budgeting generally no review organization justifications is required in ZBB. A manager is required for going activities, where as to justify not only the new proposal but also the going activities (Maheshwari, 2000: 117).

2.1.13.4 Activity Costing

“Responsibility accounting system generally accumulates costs by department and product costing systems associates cost with unit of product or service organizations also frequently find it useful to associates costs well activities. By decomposing and organizations productions process into discrete set of activities and then associating cost with each of those activities management is in a better position to determine the costs an benefits of continuing the activities. More over by systematically identifying the activities throughout the organization managers can identify redundant activities. Some managers have found to their surprise that the some activity was being done in a dozen of different places in the company. An activity cost analysis can assists managers in eliminating redundant activities that are not cost benefit and achieving greater coordination’s among the activities that remain” (Maheshwari, 2000: 141)

2.1.13.5 Budget Variance

Variance analysis is an important tool that can increase the usefulness of periodic performance reports. Rather than taking action only the basis of differences between actual and budgeted costs variance analysis enables management to decompose such differences into smaller sub variances. It is the deviation between budgeted goals and actual result. As performance reports shows variances the next step is to analyze such variance and to determine the underlying causes for managerial planning and control purpose.

“Variance analysis or comparison of actual results with budgeted goals has been emphasis as an integral part of control process. A basic feature of performance reports is the reporting of variances between actual and planned goals. If variance is significant a careful management study should be made to determine the underlying cause. There are numerous ways to investigate variances to determine the underlying cause” (Welsch, et al., 2000: 151).

2.2 Review of Previous Studies

2.2.1 Review of Journal/Articles

Kandasami (2009) had written an article topic on “*Responsibilities & Stages involve in Budgeting*” (Journal of Business & Industrial Management). Budgets are prepared by managers and other staff who are responsible for the activity concern. Finance staffs are technical resources that the budgeting process is completed professionally. Budgeting requires those responsible to have good interpersonal skill. It is important to be able to listen carefully and negotiation when planning and monitoring a budget. Budgets are usually managed in three stages.

- **Planning** - setting the objectives and deciding what this will mean in terms of income and expenditure, within the overall parameters of the organisation.

- **Monitoring** - measuring how well the actual income and expenditure equates to the planned amounts. Regular statements identify the differences between budgeted and 'actual' figures. Any corrective action is taken on the basis of these statements.
- **Reviewing** - evaluating through a general review how closely objectives have been achieved and identifying new parameters for the following period. This takes place towards the end of the budget cycle. It is also an opportunity to see if the budget process itself could be improved.

Eade & Williams (2010) had written an article topic on “*Advantages of Using Profit Planning*” (Journal of Business Research) a profit plan can be defined as a financial plan of an entity relating to a period of time. Its involve setting objectives to be achieved and the co-ordination of people and their organization aspirations. The financial budget is a way of quantifying resources needed to achieve the objectives.

Budgets for an organization or project are used to;

- To help implement objectives
- To calculate the estimate income and expenditure
- To co-ordinate activities
- To communicate plans
- To motivate staff by setting clear targets
- To monitor and evaluate actual performance

Danis & Ogara (2011) had written an article topic on “*Effective Budgeting*” (Journal of International Accounting) because of the growing complexity of business and business problems and because of the movement toward decentralization in large enterprises, increased attention is being given to better planning and control techniques. Consequently, the use of sound budgeting techniques is becoming more prevalent. In addition, corporate restructuring has resulted in a trend toward placing the responsibility for budgeting at higher levels in the organization. In earlier days it was customary to find the budget

function buried deeply in the accounting operation; today it is not uncommon to have the budget function report to levels of management above the controller. Although it is still useful for the budget director to report to the corporate controller, the trend toward reporting to a higher level is a recognition of the need to have the budget function broadly based in all operating areas of the business.

Many companies use budget committees. The budget committee typically is composed of representatives from most operating areas. This composition promotes coordination. If properly administered, the budget committee can perform the very useful role of encompassing and reconciling the many diverse interests that make up a modern business. An effective budgeting system facilitates control. The budgeting system must fit the company's operational control needs.

Effective budgeting systems facilitate the value creation process. They are an invaluable component of a company's planning and control efforts. The system forces managers to plan and promotes coordination. The system supports responsibility accounting and reporting. The master budget, accompanied by detailed plans, documents the company's goals and objectives. Linking the master budget to the company's long-range and strategic planning enhances the overall planning effort.

John (2012) had written an article topic on “*Budgeting & the Management Process*” (Journal of Financial Management Training & Consultancy for Development) a budget is defined as management's quantitative expression of plans for a forthcoming period. Budgets are prepared at various levels of an organization. The master budget is defined as the overall financial plan for the period, which reflects the organization's goals and objectives. The master budget includes operating and financial budgets. Operating budgets show the company's planned sales and operating expenses. Financial budgets reflect financing plans such as borrowing, leasing, and cash management. Budgeting, when done properly, can serve as a planning and controlling system. The

company's goals and performance objectives are documented in financial terms. Once formulated, these plans are used throughout the year. Monthly performance reports compare budgeted results with actual results. To control operations, management can examine the performance reports and take necessary corrective actions.

The role that effective budgeting plays in the management of a business is best understood when it is related to the fundamentals of management. The many existing definitions of business management can be expressed in terms of five major functions: planning, organizing, staffing, directing, and controlling. Management must first plan. The plan is executed by organizing, staffing, and directing operations. To control operations, management must institute appropriate techniques of observation and reporting to determine how actual results compare to plans. Budgeting is concerned primarily with the planning and controlling functions of management.

2.2.2 Review of Previous Research Works

Sjakhwo (2008) had studied on the topic “*A study on Application of Cost-Volume-Profit Analysis as a Managerial Tool in Bhaktapur Craft Paper Limited*”.

The main objectives were:

- To study the relationship of cost, volume and profit of BCP Ltd.
- To analyze the impact of CVP of the company on productivity.
- To calculate the BEP, MOS and CM etc. and its impact on the profitability.

The major findings were:

- Cost classification is not systematic. There is no practice of segregating semi variable cost.

- Aggregate total incomes were in decreasing trend because company have not improved the total income by improving and using advance marketing skills for more products sales in existing and new market.
- Company has not focused to possibility of production of more varieties of papers.

The major recommendations were:

- There was high degree of positive correlation between sales revenue and profits; therefore it is necessary to analyze relationship changed between them.
- The company should separate expenses for research and development program which would help advancing BCP's function and production process with minimizing cost.
- Company's present poor performance should be improved by using management theory and principles like MBO, participating management activities etc.

Adhikari (2010) had conducted a research entitled "*Cost-Volume-Profit Analysis of Nepal Lube Oil Limited*"

The main objectives were:

- Whether or not NLO Ltd. is practicing CVP analysis.
- To find out the areas of the business operation, CVP analysis can be applied to improve the competitiveness of the company.
- Which parts i.e. CM, BEP, MOS etc. of CVP analysis are mostly practiced and which are not practiced till now.

The major findings were:

- Different types of profit planning tools, which are used in the academic field, are not found applied by NLO.

- CVP analysis is not applied by NLO as no segregation of cost into fixed and variable, which is the hardcore of CVP analysis.
- Company has no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So, NLO has not been able to use CVP analysis and make the realistic and smart budget.

The major recommendations were:

- NLO should minimize fixed cost by reducing interest expenses. Interest expenses has been increasing due to high increase in receivable from sales, increase of loan amount to be paid to the creditors for raw materials and other supplies. Therefore, company should adopt fast collection policy to reduce receivable with discount and other special offer to the debtors.
- As NLO is multi-product company more emphasis should be provided for the product having high contribution margin to generate more profit.
- NLO has spent a large amount on salaries & wages, it should reduce that by implementing proper manpower planning and use of latest information technology (i.e. computer software etc.) should be made to reduce unnecessary paper work and improve productivity of manpower by providing training and deploying development program.

Shakya (2011) had studied on the topic “*A study on Cost Volume and Profit Analysis of Soaltee Hotel Limited*”. She had concerned her study to examine the practice of profit planning and control in the hotel industry in Nepal.

The main objectives were:

- To study the nature of direct and indirect cost and component of cost of Hotel.
- To evaluate the profitability, financial position and sensitivity of Soaltee Hotel’s activities.

The major findings were:

- The main focus of hotel is to maximizing revenue but hotel hasn't focus of cost planning and controlling.
- Soaltee Hotel Limited is service providing company but it hasn't given emphasis to reduce variable cost ratio.
- Market study on demand and pricing has not be carried out.

The major recommendations were:

- Classification of cost into variable and fixed as well as controllable and non-controllable cost must be made within specific framework of responsibility centre and time.
- Soaltee Hotel Limited should consider BEP analysis while preparing revenue plan, operation plan and setting price of its services.
- Separate cost control department should be established for effective management of cost.

Yadav (2012) had conducted a research entitled "*Cost Volume and Profit Analysis in Nepal Aushadhi Limited*". Yadav had concerned her study to examine the practice of profit planning and control in the manufacturing companies in Nepal.

The main objectives were:

- The study of application of CVP analysis is NAL
- To evaluate the sensitivity of profitability
- To analyze the CVP and its impact in profitability of NAL.
- To study the profitability and financial position of NAL.

The major findings were:

- NAL have not applied suitable scientific method of cost classification.

- NAL couldn't put stress on effective utilization of fixed cost so it bearing higher amount of unfavorable capacity variance.
- NAL have not considered the Cost Volume Profit relationship while fixing the price of its product.

The major recommendations were:

- The industry should try to reduce the fixed cost.
- The industry should follow effective advertising policy.
- A system of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately.

Ghimire (2013) had conducted a research on the topic "*A Study on Effectiveness of Sales Planning of Nepal Telecom*"

The Main objectives were:

- To analyze the existing sales planning system of Nepal Telecom, with seasonal demand.
- To study the relationship between sales plan with other expenses.
- To analyze the relation between sales and profit.
- To analyze the sales trend and area of business expand.
- To analyze new schemes and strategy of NTC.

The major findings were:

- NT has the practice of preparing short-range sales budget but long range sales budget is not prepared in detail. Also there is a system of keeping Management Information System (MIS) Report in this company.
- The total actual sales units of NT are in increasing trend. Actual sales revenue is always higher than target.

- There is high degree of positive correlation of total sales units, but low degree of positive correlation of PSTN sales units. The regression equation and straight line of trend shows increasing trend of overall sales.
- The cost volume profit analysis of NTC shows that BEP (Break Even Point) is satisfactory.

The major recommendations were:

- There should be proper coordination and interaction between various directorate of the corporation in regard of formulation and implementation of the budget.
- Sales budget should be made on realistic ground because all other functional budgets depend upon sale budget.
- In NT the installed capacity has not been fully utilized. If the installed capacity is utilized the operating expenses will go down.
- Basis of setting target for sales and production should be defined carefully. Thus, the realistic long range, medium range and short range forecast should be made.

Dhakal (2014) had conducted a research on the topic '*A Study on Profit Planning & Control of Public Enterprises (With Reference to Nepal Electricity Authority)*'.

The main objectives were:

- To analysis the various budget activities adopted by NEA.
- To assess the financial performance of NEA by using BEP analysis and ratio analysis.
- To forecast future sales and profit trend of NEA.
- To examine the practice and effectiveness of profit planning in NEA.

The major findings were:

- The budgeted activities adopted by NEA are sales budget, production budget, operating expenses budget and operating profit & net profit budget.
- It is found that NEA is operating below BEP since BFP sales is less than actual sales during the study period and NEA has the negative margin of safety in each fiscal year during the study period.
- From the regression analysis, it is seen that the actual sales of NEA in the fiscal year 2013/014 will be Rs. 25749.99 million, cost of sales Rs. 15612.99 million, operating cost Rs. 9200.54 million, operating profit Rs. 1745.76 million, net loss Rs. 4343.86 million, total production 4260.45 GWH & total sales will be 3159.25 GWH.

The major recommendations were:

- NEA has not practiced CVP analysis. So it is suggested that NEA should practice CVP analysis and cost volume profit relationship should be considered while formulating profit plan.
- Classification of cost into variable and fixed as well as controllable and non-controllable must be made within specific framework of responsibility center and time.
- Cost plan of NEA are not systematically maintained. Separate cost control department need to be established to control cost.
- Sales revenue of NEA is in increasing trend but it is not sufficient to cover the cost and earn profit.

2.3 Research Gap

Research gap refers to the gap between previous research and this research. Many research studies have been conducted by the different students, experts and researcher about profit planning and control. There is gap between the

present research and the previous researchers. The findings of the previous researches were mostly based on actual and budgeted figure. Most of the previous researches did not disclose the financial position. Thus to fill up those gap the current research is conducted. This research study is based on using current data which are not included in previous studies. This study aims to access the profit planning mechanism of NTC. This study tried to indicate the role of profit planning to increase its profit. This study attempts to analyze the financial position of the NTC by using various statistical and financial tools. It also concludes the various findings of the research and recommendation for immediate and long term improvement and corrections.

CHAPTER III

RESEARCH METHODOLOGY

Research methodology is a general plan of how the researcher is going about answering the research questions that has set. The research worked undertaken following a systematic way, which is called the research methodology. This chapter describes the research methodology or research strategy employed in this study. The major contents of research methodology are as follows.

3.1 Research Design

Research design is the plan, structure and strategy of investigation conceived to obtain answers to research questions. Generally, research refers to definite procedures and techniques, which guide to study and propounds ways for research viability. Both analytical as well as descriptive design has been applied design for this study, this study is closely related with the various areas of sales, production and other related statement.

3.2 Populations and Sample

This research aims to studying Profit planning mechanism of NTC. In now days, four telecommunication companies are operating in Nepal so the all four companies are population of the study out of them NTC is selected for the study purpose therefore the NTC is the sample of the study. Sample of the study is selected on the basis of judgmental sampling method.

3.3 Nature and Sources of Data

This study is based on secondary data. The secondary data are collected from annual reports of NTC, balance sheet, profit and loss A/C, cost detail sheet, previous thesis and other relevant published and unpublished documents of NTC.

3.4 Research Variables

The research variables of this study is mainly sales, production, profit and loss, capacity utilization, manpower, capital expenditure, breakeven point, profit volume ratio, margin of safety, flexible budget and cash flows related to short term and long term periods of NTC.

3.5 Data Analysis Tools

The collected data from various sources are managed to analyze and presented in proper tables, formats and graphs such as table and formats are interpreted and explained wherever necessary. To analyze the collected data financial and statistical tools are used. In statistical tools, mean, standard deviation, coefficient of variation, correlation coefficient, coefficient of determination, probable error of correlation, regression equation, time series analysis, graphs and diagrams are taken, whereas in financial tools ratio analysis, BEP analysis are used.

3.5.1 Statistical Tools

3.5.1.1 Arithmetic Mean or Average

The mean or average value is a single value within the range of the data that is used to represent all the values in the series. Since an average is somewhere within the range of the data, it is also called a measure of central value. It is calculated by;

$$\text{Mean } (\bar{X}) = \frac{\sum X}{N}$$

Where,

\bar{X} = Arithmetic Mean

$\sum X$ = Sum of values of all items, and,

N = Number of items

3.5.1.2 Standard Deviation

The standard deviation is the measure that is most often used to describe variability in data distributions. It can be thought of as a rough measure of the average amount by which observations deviate on either side of the mean. Denoted by Greek letter's (read as sigma), standard deviation is extremely useful for judging the representatives of the mean. Standard deviation is calculated as;

$$\text{Standard Deviation } (\delta_X) = \sqrt{\frac{1}{n} \left[\sum X^2 - \frac{(\sum X)^2}{n} \right]}$$

Where,

σ	=	Standard deviation
$\sum X^2$	=	Sum of square of the variables
$(\sum X)^2$	=	Square of the sum of x variables
n	=	Number of items

3.5.1.3 Regression Analysis

Regression analysis is a mathematical measure of the average relationship between two or more variables in terms of original units of data. There are two types of variables in regression analysis – dependent variable and independent variable, the variable whose value is influenced or is to be predicted is called dependent variable whereas the variable which influences the value or is used for predication is called independent variable. The dependent variable is also known as regressed or explained variable while the independent variable is called as regress or predictor or explanatory variable.

A line of regression is the line, which gives the best estimate to the value of one variable for any specified value of the other variable. Thus the line of regression is the line of best fit. The term best fit is interpreted in accordance with principle of Least Squares which consists in minimizing the sum of

squares of the residuals or the errors of estimate, i.e. deviation between the given observed values of the variables and their corresponding estimate values as given by the line of best fit. If we have two variables X and Y, we shall have two regression lines, Minimizing the sum of squares of error parallel to y-axis gives the equation of the line of regression equation of Y to X and minimizing the sum of squares of the errors parallel to x-axis, gives the equation of the line of regression of X on Y.

Regression equation of Y on X is given by

$$\text{In } Y = a + bx \dots\dots\dots (i)$$

Where,

Y= Dependent variable

X= Independent variable

a = Intercept of the line

Regression Line of Y on X;

$$Y - \bar{Y} = r_{xy} \times \frac{\delta_Y}{\delta_X} (X - \bar{X})$$

Where,

Y= Dependent variable

X= Independent variable

\bar{X} = Average of X Variables

\bar{Y} = Average of Y Variables

r_{xy} = Correlation between X & Y Variables

δ_X = Standard Deviation of X Variables

δ_Y = Standard Deviation of Y Variables

3.5.1.4 Correlation Coefficient

Correlation is a statistical tool design to measure the degree of association between two or more variables. In other word if the changes in one variable affects the changes in other variable, then the variable are said to be co-related

when it is used to measure the relationship between two variables, then it is called simple correlation. The coefficient of correlation measures the degree of relationship between two sets of figures. Among the various methods of finding out coefficient of correlation, Karl Pearson's method is applied in the study. The result of coefficient of correlation is always lying between +1 and -1. The formula for the calculation of coefficient of correlation between X and Y is given below.

$$\text{Correlation } (r_{xy}) = \frac{n \sum XY - \sum X \sum Y}{\sqrt{n \sum X^2 - (\sum X)^2 \times n \sum Y^2 - (\sum Y)^2}}$$

Where,

r_{xy}	=	Correlation between X & Y variables
$\sum XY$	=	Sum of Multiply of Variables X & Y
$\sum X$	=	Sum of Variables X
$\sum Y$	=	Sum of Variables Y
$\sum X^2$	=	Sum of Square of Variables X
$\sum Y^2$	=	Sum of Square of Variables Y

3.5.1.5 Coefficient of Variation

The coefficient of variation is the ratio of standard deviation to the mean for a given sample used to measure spread. It can also be thought of as the measure of relative risk.

$$CV = \frac{\sigma}{\bar{X}} \times 100$$

Where,

CV	=	Coefficient of Variation
σ	=	Standard Deviation
\bar{X}	=	Arithmetic Mean

3.5.1.6 Assessment of the Sample Correlation Coefficient (t-test)

For this study, t-test for significance of an observed and sample correlation coefficient is used.

Set up Hypothesis

Null hypothesis (H_0); $\rho = 0$ i.e. There is no correlation between the considered variables.

Alternative Hypothesis (H_1); $\rho \neq 0$ i.e. There is significant correlation between the considered variables.

Test statistic under H_0 ;

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

Where,

r = Sample correlation between two variables

r^2 = Sample correlation Coefficient

n = No of Pair of observations

Level of significance: Level of significance $\alpha = 5\%$

Critical Value: Tabulated or critical value of t at α % level of significance for (n - 2) degree of freedom obtain from 't' tables.

Decision: If calculated 't' is less than or equal to tabulated value of 't' it falls in the accepted region and the null hypothesis is accepted and if calculated 't' is greater than tabulated 't' null hypothesis is rejected.

3.5.2 Accounting Tools

3.5.2.1 Percentage Change

To find out the changing positions of different amount this ratio is used. This ratio is calculated to measure the acceleration or retardation of any variables to the company is to take the suitable direction. It is calculated in following way.

$$\text{Annual percentage change} = \frac{\text{Amount of This Year} - \text{Amount of Last Year}}{\text{Amount of Last Year}}$$

3.5.2.2 Contribution Margin

The difference between production amount and variable cost is known as the contribution margin. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. Contribution margin can be expressed by

$$\text{Contribution margin} = \text{production volume (Sales)} - \text{variable cost}$$

3.5.2.3 Profit Volume Ratio

It establishes a relationship between the contribution and production volume. The factors profit and volume are interconnected and dependent with each other. Profit depends upon contribution margin and production. It can be expressed by;

$$\text{Profit volume ratio} = \frac{\text{Contribution Margin}}{\text{Production or Sales}}$$

3.5.2.4 Break Even Point

The point which breaks the total costs and selling price evenly to show the level of output or production, at which there shall be neither profit nor loss, is regarded as break-even point. Through contribution margin approach, break-even point can be expressed by;

$$\text{Break even point in Rs.} = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

3.5.2.5 Margin of Safety (MOS)

It is the difference between the actual sales revenue and the break even sales revenue. It can be expressed by;

$$\text{Margin of Safety} = \text{Actual Sales} - \text{Break Even Sales}$$

CHAPTER - IV

PRESENTATION AND ANALYSIS OF DATA

Presentation and analysis of data is an important stage of the research study. The main purpose of analyzing the data is to change it from an unprocessed form into an understandable presentation. The analysis of data consists of organizing data by tabulating and then placing that data in presentable form by using figures and tables. The main purpose of this study is to examine the current practice of profit planning and its effectiveness in non-manufacturing public enterprise. NEPAL TELECOM has been selected as a case study to accomplish these objectives. This chapter of the paper analyzes and presents profit planning of the NTC. It compares actual and target sales figures and identifies related sales variances of the company and other sales-related analyses also done such as production planning of NTC and its effect on sales planning, CVP analysis, financial ratios related to sales, variance analysis, performance report etc.

The sales, production and other related figures of the previous year are presented and analyzed to know the overall economic and financial trend and to estimate the possible future trend of NTC. This study covers the period of 5 years from 2066/067 to 2070/071.

4.1 Sales Plan and Achievement of NTC

Formulation of sales budget is the first and important step in developing the overall budget procedure. It is the foundation for effective planning in business organization and it is the primary source of cash and all other functional budgets are prepared on the basis of sales budget. The sales plan is that step which opens the door for the future which is not certain, when actual sales is not far from the planned sales then it is known as a good plan.

For this, sales budget preparation should be done on realistic grounds. If sales budget is not realistic all other budgets will not be realistic. So, it is also

referred as a market penetration plan. A sales plan is a comprehensive statement of broad objectives; specific goals, basis strategies and planning premises. It is developed for a certain future period ie. It can be prepared quarterly, monthly or yearly. Sales plan is prepared on the basis of sales forecast but sales forecast in itself is not a sales plan. The preparation of sales plan involves the following four interrelated steps.

- The sales forecast
- The Marketing Plan
- The advertising and Promotion expenses budget
- Selling & Distribution expenses budget.

Sale budget is prepared by product, by interim time periods and by sales territory. The overall responsibility of preparing sales budget is upon the sales manager although chief executives should also be involved in such activities. The objectives of the Nepalese public enterprises the objectives are mainly social welfare and commercial, in the case of fulfilling the social obligation. There is no realistic sales plan in Nepalese manufacturing PE's. Profit is less important for PE's but at the same time there is commercial obligation, in this case the corporation should earn certain profit also.

Nepal Telecom has a practice of preparing sales budge. It has practice of preparing sales budget for the coming year. NTC prepares sales budget according to the nature of its consumers. And consumers are categorized like government, business organization, residential, special, service, non-service, and others. The overall responsibility of preparing sales budget is upon planning directorate of NTC. Maintaining coordination with revenue section, the sales budget is prepared by planning directorate. Now, the attempt begins to present the corporation previous sales performance and their achievement to know about the sales trend of past and to forecast the possible future trend of the NTC. For this purpose we have to analyze the past sales data of corporation.

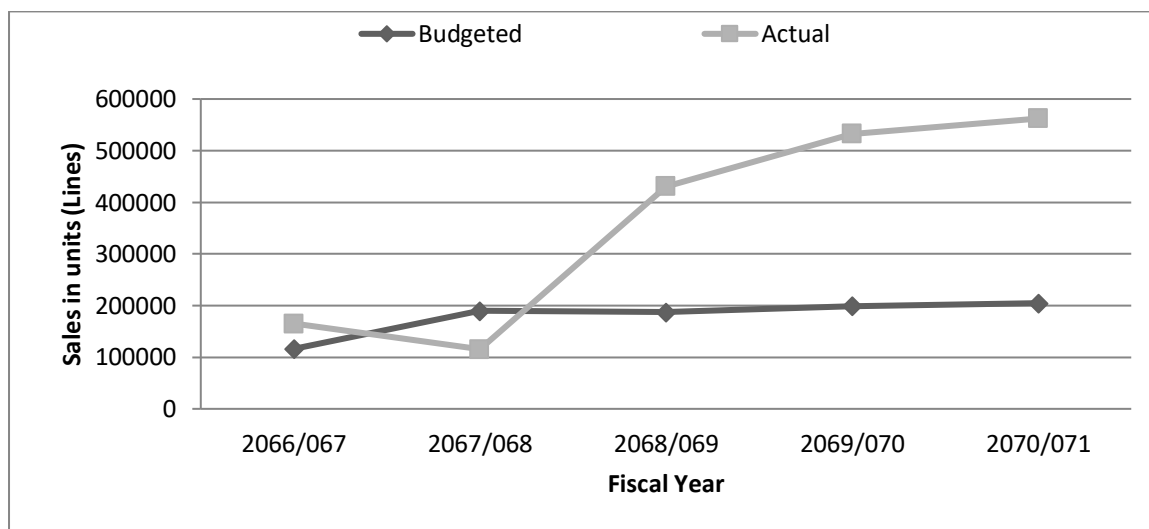
The following table presents the sales budget and actual sales achievement in lines and in Rs. from the fiscal year 2066/067 to 2067/68.

Table: 4.1
Sales Target & Sales Achievement of NTC

Fiscal Year	In Lines			Rs. In million		
	Budgeted	Actual	Achievement %	Budgeted	Actual	Achievement %
2066/067	116171	164885	141.93	7316.55	8823.08	120.59
2067/068	189433	115531	60.99	8819.06	9194.29	104.25
2068/069	186895	430868	230.54	8696.68	12058.91	138.66
2069/070	198767	532391	267.8	15739.0	14751.62	93.73
2070/071	204657	562162	274.68	18708.05	17889.31	95.62

Source: Annual Report of NTC 2066/067 to 2070/071

Figure: 4.1
Actual & Budgeted Sales Line of NTC



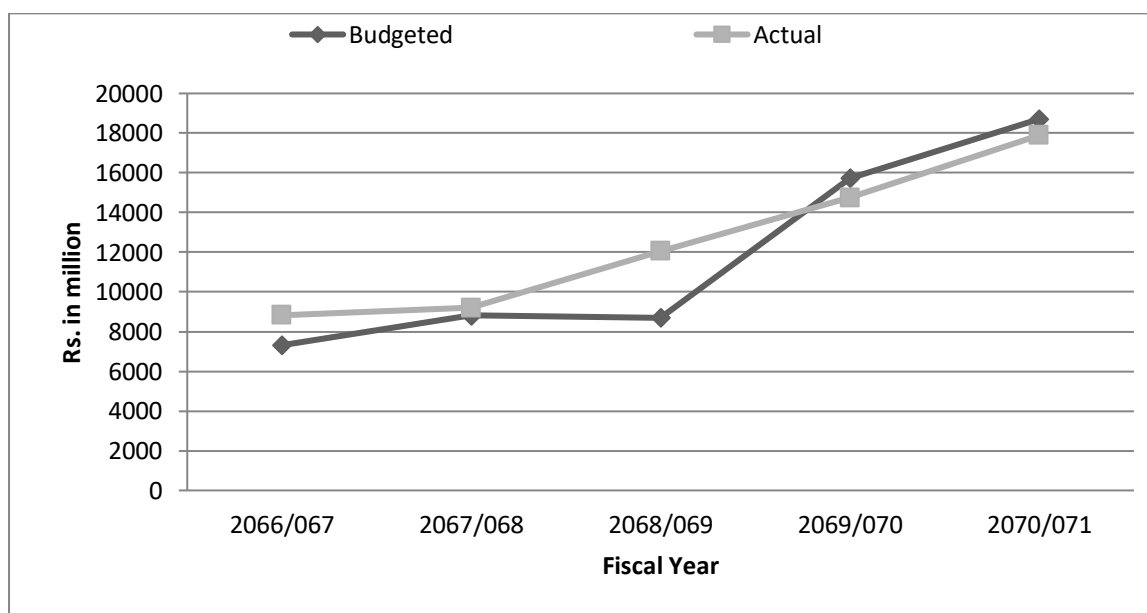
The above table and figure show the target and achievement of sales lines and sales revenue (operating revenue) of NTC from F.Y. 2066/067 to 2070/071. From the above table, we can see that, there is not consistency in target as well as actual sales in lines. Sales target in units till 2070/071 is in increasing trend but in 2068/069 it has decreased. At the same time, the actual sale in lines till

2067/068 is decreased and after that it is increasing trend. Again it has increased in 2068/069. But increasing rate is slower after that till 2070/071. The actual distribution exceed target because of network expansion and high distribution of Pre-Paid Mobile.

When we analyze the budgeted and actual sales revenue, we can say that actual sales achievement of NTC is highly consistent with target sales. Actual sales revenue in every year exceed target except in F.Y. 2069/070. In F.Y. 2070/071 revenue collection has decreased due to close of server some period of time. Actual revenue exceeds budgeted revenue because distribution and revenue collection from Mobile Service and value added service (SMS, VAS) is very high. This indicates that consistency of sales plan and realistic targets. Effective presentation of the above data in figure is as follows.

Figure: 4.2

Actual & Budgeted Sales Rs. of NTC



The above diagram shows that there is huge gap between budgeted and actual sales in F.Y. 2068/069. The following table represents the budgeted and actual sales lines of PSTN tel. service of NTC.

Table: 4.2

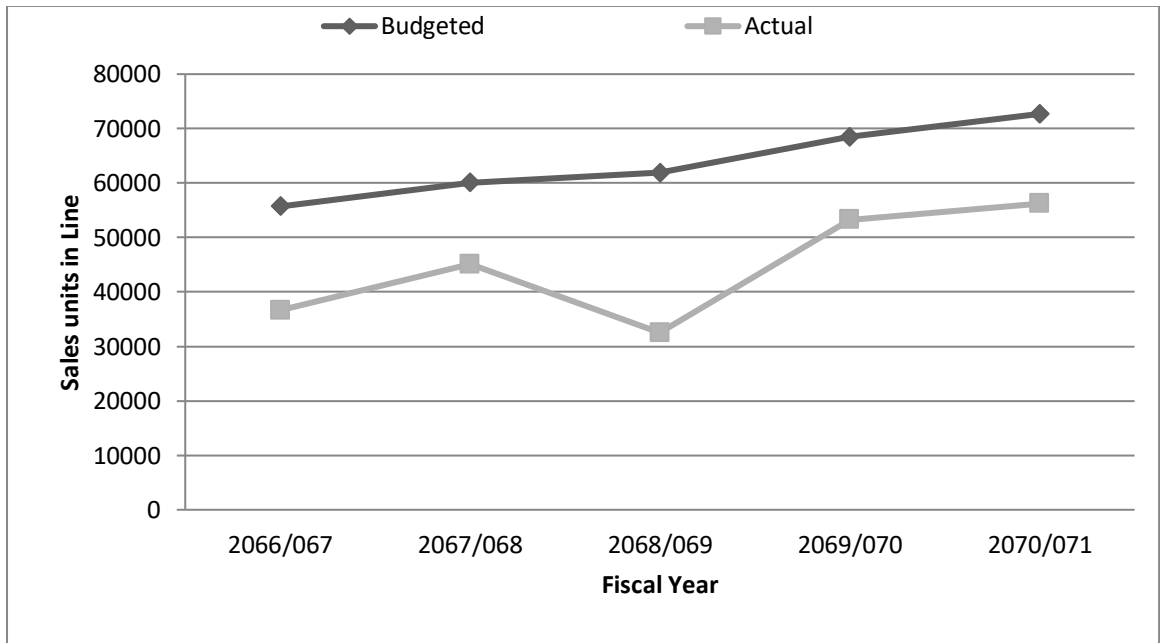
Sales Target and Sales Achievement of PSTN Tel. Service of NTC in Lines

Fiscal Year	Budgeted	Actual	Achievement (%)
2066/067	55696	36601	65.72
2067/068	60083	45058	74.99
2068/069	61895	32522	52.54
2069/070	68494	53239	77.73
2070/071	72698	56216	77.32

Source: Annual Report of NTC 2066/067 to 2070/071

Figure: 4.3

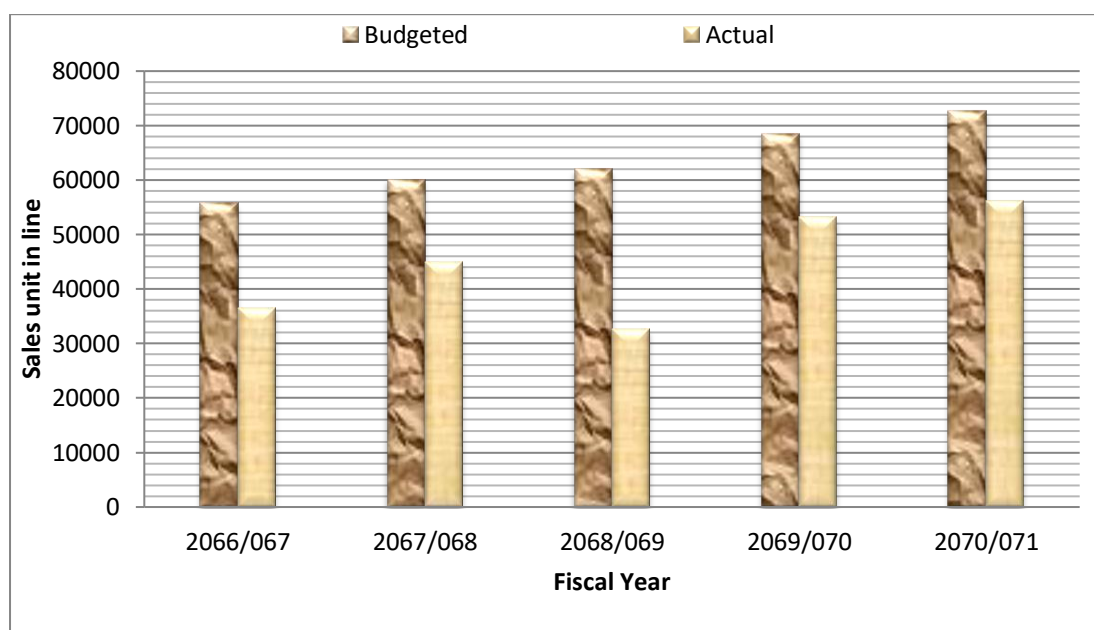
Graph of Budgeted and Actual Sales Lines of PSTN Tel. Service of NTC



The above table and figure show the target and achievement of sales units of PSTN Tel. from F.Y. 2066/067 to 2070/071. From the above table, we can see that, there is not consistency in target as well as actual sales in units. Actual sales units has not meet target in each year, it was due to the lack of sufficient network, cables, exchange center and availability of alternative services like, Pre-Paid Mobile, Post-Paid Mobile, CDMA, UTL's Phones etc. Presentation of above data in graph and bar diagram is as follows.

Figure: 4.4

Diagram of Budgeted and Actual Sales Lines of PSTN Tel. Service of NTC



The above graph shows that there is huge gap between budgeted and actual sales till 2070/071. After analyzing the past trend of NTC in respect of sales, now we are going to analyze the annual sales budget for the fiscal year 2070/071. NTC has practice of preparing short range budget for coming year. The following table shows the summary of short range (tactical) sales budget and achievement of NTC.

Table: 4.3

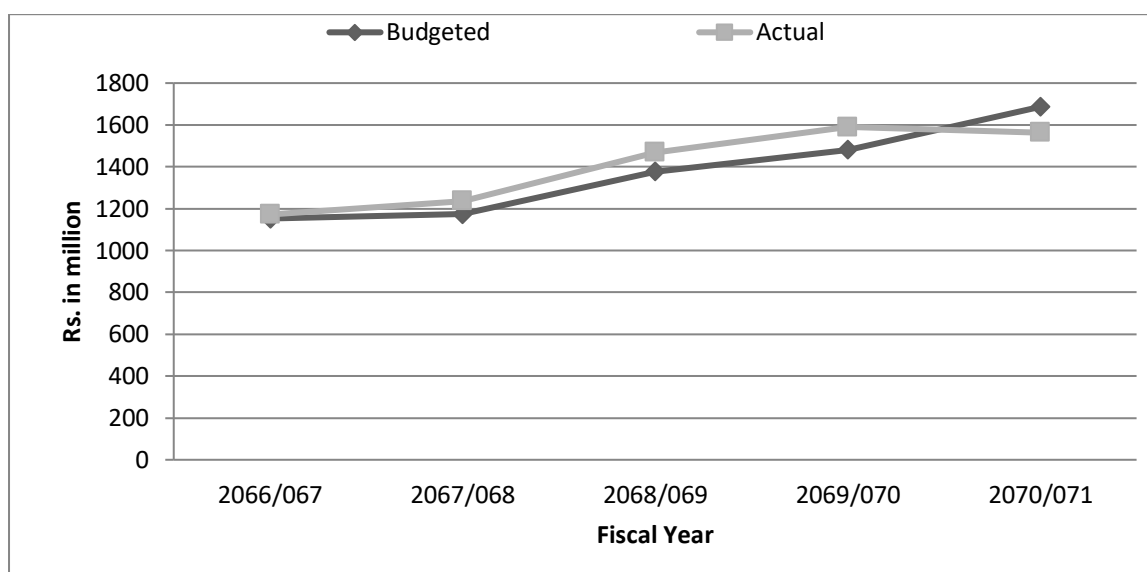
Sales Budget and Achievement of NTC in ISTD Sector (Rs. in Million)

Fiscal Year	Budgeted	Actual	Achievement %
2066/067	1153	1172.15	101.66
2067/068	1174.09	1235.76	105.25
2068/069	1377.52	1469.36	104.49
2069/070	1480.56	1590.55	107.43
2070/071	1686.54	1563.52	92.70

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.5

Trend of Sales Budget and Achievement of NTC in ISTD Sector



The above table and figure show great achievement of revenue collection in ISTD sector every year. But in comparison to the total operating revenue it seems in decreasing trend. This is due to internet phone which has low rate in ISTD phone call. The above figure of budgeted and actual sales revenue presented in graphical form as follows. This graph shows higher actual sales than budgeted sales in every year. This graph shows higher actual sales than budgeted sales in every year.

Table: 4.4

Sales Revenue Per Employee

Fiscal Year	Total Sales Revenue (000)	No. of Employee	Sales Per Employee	% Change
2066/067	8823080	4850	1819.23	-
2067/068	9194296	5709	1610.49	-11.47
2068/069	12058914	5717	2109.30	30.97
2069/070	14751624	7030	2098.38	8.47
2070/071	17889310	7088	2523.88	20.27

Source: Annual Report & MSI Report of 2066/067 to 2070/071

We can see in the above table that the sales revenue per employ is in increasing trend except the FY 2067/068 and it has decreased in FY 2067/068. But overall sales revenue per employee has increased by 38.29% [i.e. $(2523.887 - 1819.239)/1819.239 = 38.29$].

4.2 Profit and Sales Achievement of NTC

Profit is considered as one of the major element of each and every business endeavor for survival further development and fulfilling social expectation. In modern business, efficiency and effectiveness of any business organization or management are measured from earning power of profit. In cases of PES in Nepal, the basic establishment objectives are to mobilize the resource and generate revenue or surplus for substantial economic development, so that PES have to get some profit too. NTC prepare a projected profit and loss. account in advance and the end of each financial year. NTC as a PE is also required to generate surpluses for its severity of the unforeseeable adverse circumstances. Following table shows the profit patter of NTC.

Table: 4.5
Profit Pattern of NTC

Fiscal Year	NP (Rs. In 000)	Percentage Change
2066/067	5652688	-
2067/068	7942902	40.52
2068/069	10178025	28.14
2069/070	10775154	5.87
2070/071	11422317	6.01

Source: Annual Report & MSI Report of 2066/067 to 2070/071

The above table shows the increasing net profit trend of NTC. Net profit after tax of NTC has increased by 40.52% it is good performance but it has increase in FY 2068/069 by 28%. It is because of increase in tax rate and increase of interest expenses on borrowings. Again it has shown better performance in FY

2069/070 and 2070/071. Net profit after tax has increased due to increase in total sales revenue. Overall profit achievement of NTC is remarkable. Forecasted and actual net profit of NTC for FY 2066/067 to 2070/071 has shown in the table, graph and diagram as follows.

Table: 4.6

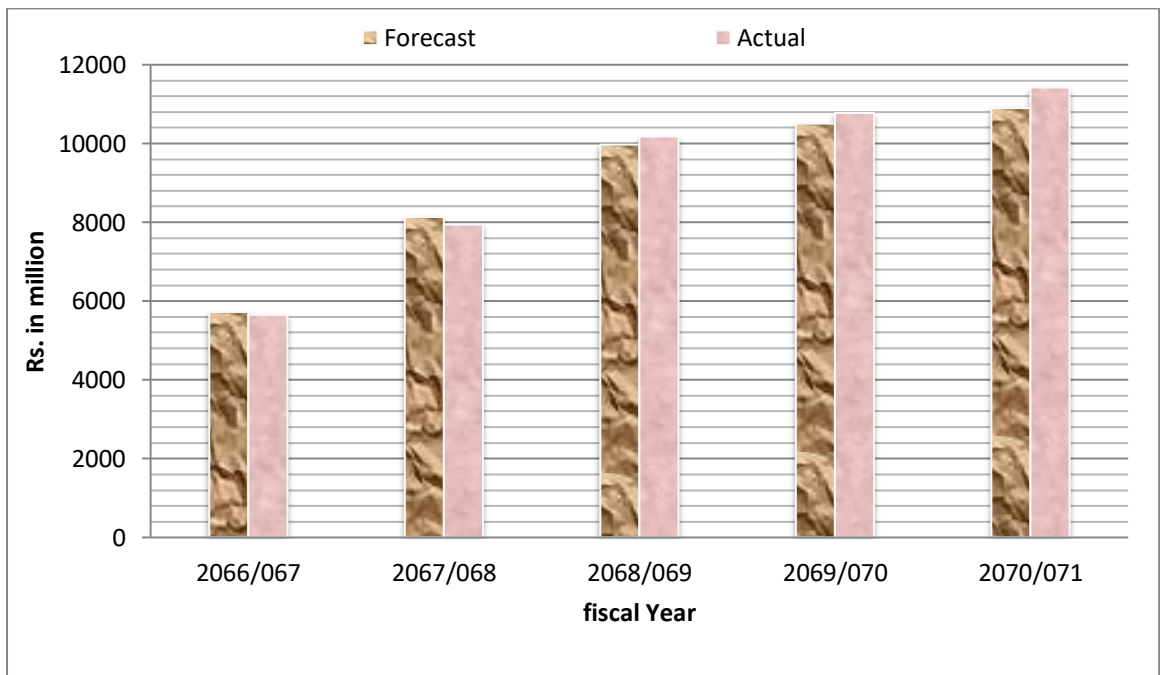
Forecasted and Actual Net Profit After Tax of NTC (Rs. in Million)

Fiscal Year	Budgeted	Actual	Achievement in %
2066/067	5724.36	5652.68	98.74
2067/068	8135.37	7942.90	97.63
2068/069	9973.49	10178.02	102.05
2069/070	10506.87	10775.154	102.55
2070/071	10898.79	11422.31	104.80

Source: Annual Report & MSI Report of 2066/067 to 2070/071

Figure: 4.6

Diagram of Forecasted and Actual Net Profit after Tax of NTC



From the above table and graph we see that the forecast of NP after tax is not realistic. Most of the year achievement of NP after tax is higher than

forecasted. Another way to see the net profit of NTC is to compare it with sales revenue. So, table no 4.9 shows the net profit on sales revenue of NTC.

Table: 4.7

Net Profit on Sales Revenue of NTC (in Million)

Fiscal Year	NPAT	Total Sales Revenue	% of NP on Sales
2066/067	5652.69	8823.08	64.06
2067/068	7942.90	9194.29	86.38
2068/069	10178.02	12058.91	84.40
2069/070	10775.15	14751.62	73.04
2070/071	11422.32	17889.31	63.84

Source: Annual Report of 2066/067 to 2070/071

In general business ethics, at least 10% profit on sales is necessary to move organization well but table no.4.9 shows very high percentage of net profit on sales. It means NTC could able to fulfill the general business objectives company but which shows that the NTC has imposed high call rate to general public and exercising in monopoly market.

4.3 Cost-Volume-Profit Analysis

Cost-Volume Profit (CVP) analysis is the process of costs and profits for a relevant range of activity and for a particular time frame. It helps to understand the inter relationship between cost, volume and profit in an organization by focusing on interaction between price of products, volume or level of activity, per unit variables costs, total fixed cost and mix product sold. It is one of the most important and powerful analytical tool for short- term planning. It is a study of cost behavior generally cost behaves in two ways with relation with the volume of output is called variable cost and the second is called fixed cost which is in constant on certain level of production. Thus, CVP is an analytical tool to differentiate these two costs and interpret the required volume of production and estimated profit.

CVP analysis is an important tool of profit planning. It is generally used to determine break even point or to gain certain amount of profit. It is method to cover fixed, variable cost and have an estimation of profit. It is method to cover fixed, variable cost and have an estimation of profit. In ways it is a plan for future manufacturing activities. CVP analysis provides attention directing motive in the overall performance of the business enterprise. It indicates at which volume cost and revenue are in equilibrium. BEP is defined as those level of production where revenues and cost of firms are equal and their is neither profit or loss. Cost-volume profit analysis of NTC is based on certain assumptions which are as follows.

- Cost volume structure is based on the accounting data of FY 2070/071.
- Activity base is selected in terms of sales.
- All costs are classified into two categories fixed cost and variable cost.
- Selling price, variable cost ratio, fixed cost per annum is assumed to be constant for the whole year.
- There is no inventory

Table: 4.8

The Classification of Expenses in Fixed and Variable Components

Expenses Items	Cost Behavior
Employees Expenses	Fixed
Operation & Maintenance expenses	Variable
Depreciation expenses	Fixed
Administrative Expenses	Fixed
Interest	Fixed
Royalty	Fixed

Source: Annual Report & MSI Report of 2066/067 to 2070/071

With the help of above data, we can analyze the following relationship of cost,volume and profit.

Table: 4.9

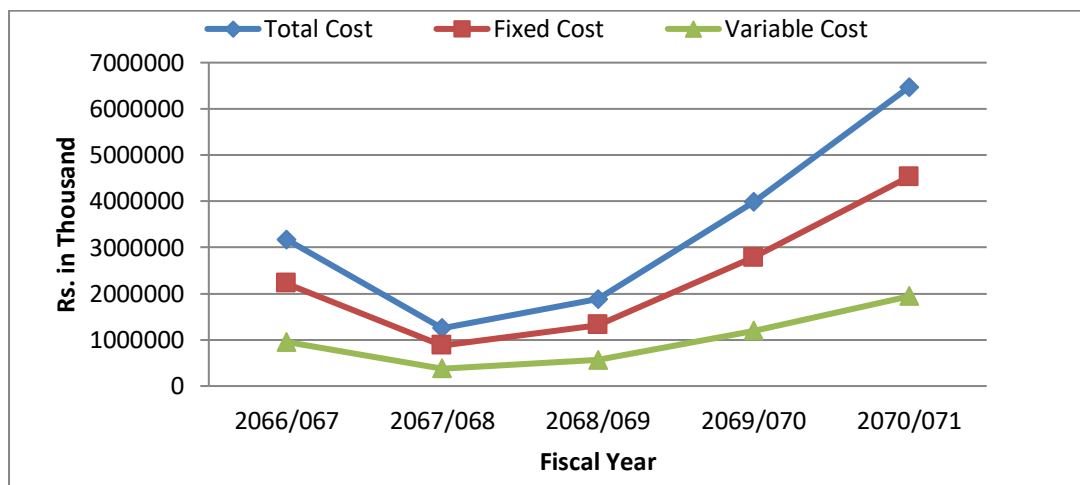
Sales Revenue, Net profit & Cost of NTCC

Fiscal Year	Sales Revenue	Net Profit	Total Cost	Fixed Cost	Variable Cost
2066/067	8823080	5652688	3170392	2219274	951117.6
2067/068	9194296	7942902	1251394	875975.8	375418.2
2068/069	12058914	10178025	1880889	1316622	564266.7
2069/070	14751624	10775154	3976470	2783529	1192941
2070/071	17889310	11422317	6466993	4526895	1940098

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.7

Cost Nature of NTC



The above table and figure show that the total cost, fixed cost & variable cost are increases each year during the study period year except the fiscal year 2067/068. Fixed cost is higher than variable cost each year during the study period and the increasing rate of fixed cost is high than variable cost.

4.3.1 Variable Cost Volume Ratio (V.V. Ratio)

V.V Ratio shows the proportion of variable cost on sales revenue. The following formula is used to calculate the V.V. ratio.

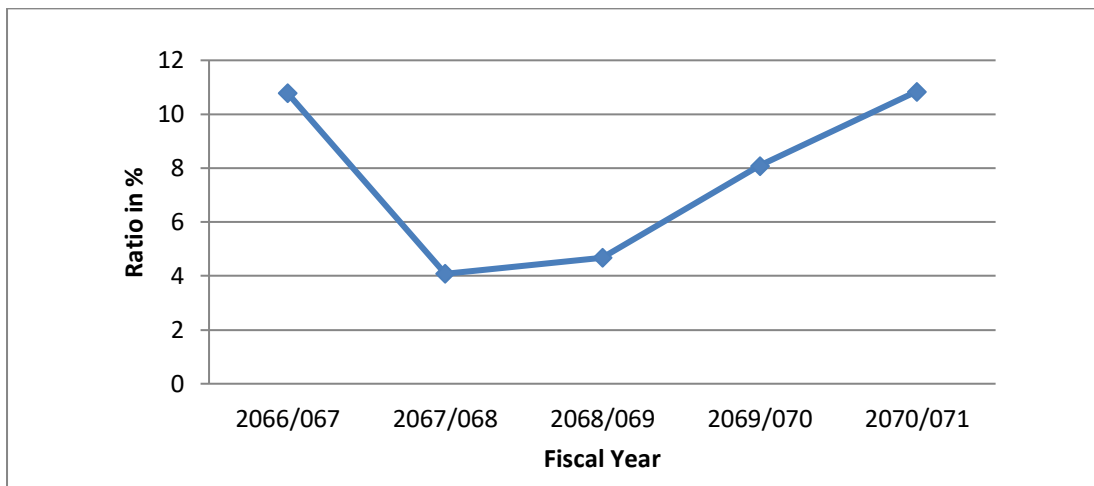
$$\text{V.V Ratio} = \frac{\text{Variable Cost}}{\text{Sales Revenue}}$$

Table: 4.10
Variable Cost Volume Ratio

Fiscal Year	Sales Revenue	Variable Cost	V.V. Ratio (%)	% Change
2066/067	8823080	951117.6	10.78	-
2067/068	9194296	375418.2	4.08	-62.15
2068/069	12058914	564266.7	4.68	14.71
2069/070	14751624	1192941	8.09	72.86
2070/071	17889310	1940098	10.85	34.12

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.8
Variable Cost Volume Ratio



Variable cost volume ratio shows that the proportion of variable cost on total sales revenue, in the fiscal year 2066/067 variable cost is 10.78% of total sales revenue after that it is 4.08% & 4.68% in the fiscal year 2067/068 & 2068/069 after that it is increases to 8.09% & 10.85% in the fiscal year 2069/070 & 2070/071 respectively. It shows that the variable cost is low in the company comparing to its sales revenue.

4.3.2 Contribution Margin Ratio (CM Ratio)

This ratio shows the proportion of margin left for fixed cost and profit per rupee of sales.

$$\text{CM Ratio} = 1 - \frac{\text{Variable Cost}}{\text{Sales Revenue}}$$

Table: 4.11

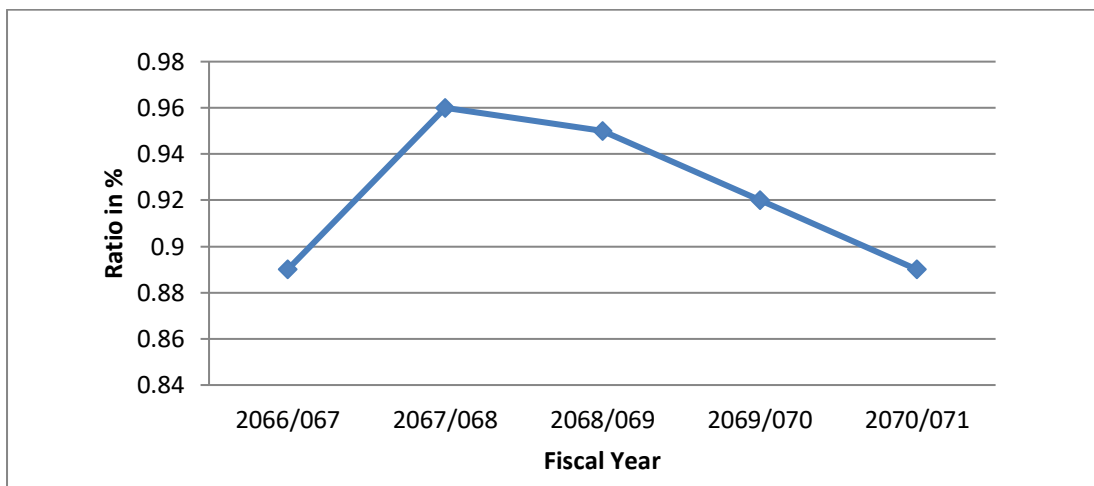
Profit Volume Ratio

Fiscal Year	Sales Revenue	Variable Cost	CM	CM Ratio	% Change
2066/067	8823080	951117.6	7871962.4	89.22	-
2067/068	9194296	375418.2	8818877.8	95.92	7.51
2068/069	12058914	564266.7	11494647.3	95.32	-0.63
2069/070	14751624	1192941	13558683	91.91	-3.58
2070/071	17889310	1940098	15949212	89.15	-3.00

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.9

Profit Volume Ratio



Above table and figure shows that the contribution margin ratio of NTC is greater than 88% each year during the study period which shows better position of the company. However, the profit volume ratio is decreasing in the current year which is not better signal for the company. The profit volume ratio is 89.22% in the fiscal year 2066/067 and increases to 95.92% in the fiscal year

2067/068 after that it is decrease than previous year and reaches to 89.15% at the end of fiscal year 2070/071.

4.3.3 Break Even Point (BEP)

BEP may be defined as a point of which the firm's total revenues are exactly equal to total cost, yielding zero income. The no profit no loss point is a break-even point or a point of which loss ceases and profit begins with the help of PV ratio.

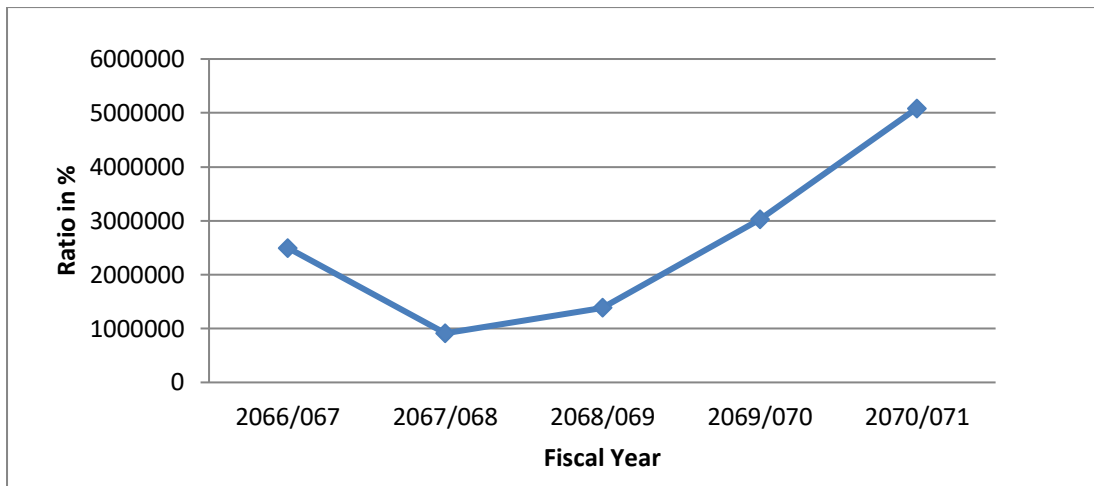
$$\text{BEP in Rs.} = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

Table: 4.12
Break Even Analysis

Fiscal Year	Fixed Cost	P.V. Ratio	BEP Sales	% Change
2066/067	2219274	0.89	2493566	-
2067/068	875975.8	0.96	912475	-63.41
2068/069	1316622	0.95	1385918	51.89
2069/070	2783529	0.92	3025575	118.31
2070/071	4526895	0.89	5086399	68.11

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.10
Break Even Analysis



BE sales is that sales where the company is in no profit no loss condition if the actual sales is greater then BE sales the company earn profit if the actual sales is less the BE sales the company suffer from loss. In case of NTC, each year actual sales is greater than BE sales so the company earning profit each year. It indicates that CVP position of NTC is very good.

4.3.4 Margin of Safety (MOS)

Margin of safety is the excess of budgeted (or actual) sales over the break even sales volume. It is the difference between the budgeted or actual sales revenue and the break-even sales revenue.

$$\text{MOS} = \text{Actual Sales} - \text{B.E. Sales}$$

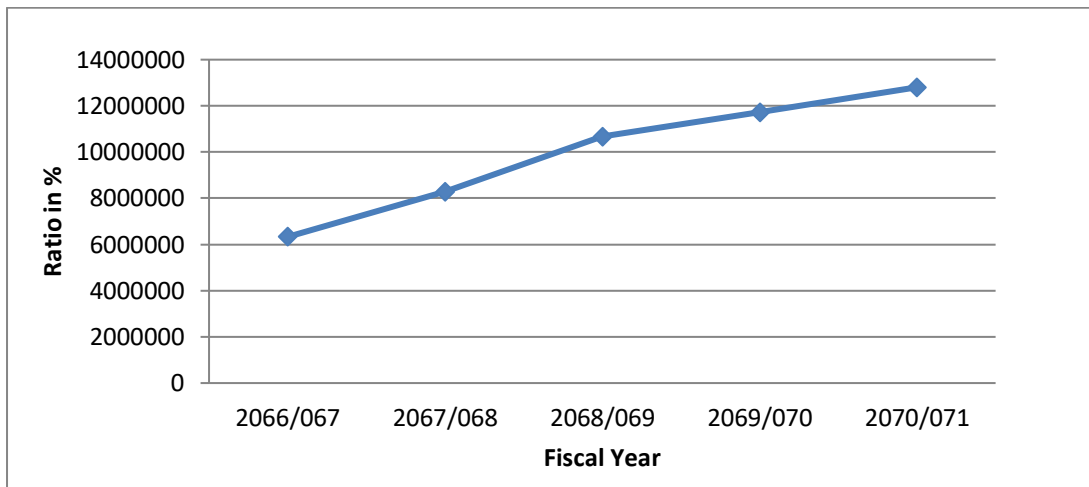
Table: 4.13

Margin of Safety Analysis

Fiscal Year	Actual Sales	BE Sales	MOS	% Change
2066/067	8823080	2493566	6329514	-
2067/068	9194296	912475	8281821	30.84
2068/069	12058914	1385918	10672996	28.87
2069/070	14751624	3025575	11726049	9.87
2070/071	17889310	5086399	12802911	9.18

Source: Annual Report of 2066/067 to 2070/071

Figure: 4.11
Margin of Safety



Margin of safety is the excess amount of actual sales over the BE sales which is increases each year during the study period. Higher margin of safety shows the strong earning position of the company. NTC has the high margin of safety and it is increases each year during the study period. In the fiscal year 2066/067 the margin of safety amount is Rs. 6329514 thousand it is increases each year than previous year and reaches Rs. 12802911 thousand at the end of fiscal year 2070/071.

4.4 Variance Analysis

Variance is the deviation between budgeted or planned goals and actual results. For better performance the next step it is necessary to analyze variances and to determine the underlying causes for managerial planning and control purpose variance are deemed to be favorable and unfavorable, depending on whether they reflect performance above or below standard. It is the basic features or performance report to indicate the variance between actual results and planned and budgeted goals. If a variance is significant, a careful study should be made management to determine the underlying causes. There are numerous ways to study or investigate variance.

- Direct observation
- Investigation by staff groups

- Internal audits
- Special studies
- On the spot investigation by line management.
- Analysis of work situation including the flow of work, coordination of activities effectiveness of supervision and other prevailing circumstance.

Variance analysis is an important tool that can increase the usefulness of period performance report. Rather taking action only on the basis of different between actual and planned or budgeted. Variance analysis has wide application in financial reporting. It is frequently applied in following situations.

- Investigation of variance between actual result and standard cost. The standard costs are used as the base.
- Investigation of variance between actual of the current period and the actual results of prior period. The prior period is considered as the base.
- Investigation of the variances between actual result and planned goals reflected in the profit plan. The planned goals are used as the base.

Generally following steps involve in analyzing variances

- Setting standards.
- Measurement of performance
- Analyzing variances
- Taking correlative action

4.4.1 Sales Variance of NTC

The researcher going to analyze sales variance in units (lines) and Rupees as required for this research paper when actual sales are higher than budgeted sales it is known as favorable variance and such as variance is usually a sign of efficiency of the NTC and vice versa. The following table shows the sales variance of NTC of last five fiscal year.

Table: 4.14
Sales Variance in Lines

Fiscal Year	Budgeted Sales	Actual Sales	Variance(±)	Remarks
2066/067	116171	164885	48714	Favorable
2067/068	189433	115531	-73902	Unfavorable
2068/069	186895	430868	243973	Favorable
2069/070	198767	532391	333624	Favorable
2070/071	204657	562162	357505	Favorable

Source: Annual Report & MSI Report of 2066/067 to 2070/071

From the analysis of the above table we find that the actual sales achievement in FY 2067/068 is unfavorable and it is Favorable in remaining FY.

4.5 Statistical Analysis

4.5.1 Analysis of Targeted and Actual Sales of Total Lines

In order to find out the nature of variability of sales budget and actual sales of different years we have to calculate the arithmetic mean, standard deviation and coefficient of variation of the budgeted and actual figures of NTC for 5 years from FY 2066/067 to 2070/071.

Table: 4.15
Statistical Information Table of Target and Actual Sales in Lines

Statistical Tools	Targeted Sales Lines	Actual sales Lines
Mean	179184.60	361167.40
Standard Deviation (δ)	35942.688	208229.768
Coefficient of Variation (CV)	20.05%	57.65%
Correlation (r)	0.630	
Probable Error (P.E)	0.18	

Source: Appendix I

As stated on statistical information table no. 4.13, mean, standard deviation and coefficient of variation of actual sales is greater than budgeted sales. It shows that actual sales in lines is more variable and less consistent than budget. For the calculation of correlation (r), Budgeted sales figure is assumed as independent variable (X) and actual sales figure is assumed as dependent variable (Y). From the above figure, there is positive correlation between budgeted and actual sales units.

It indicates that actual sales increase as target sales increase. The significance of r is tested with probable error. Value of r is more than PE (r) so it may conclude that value of r is significant. So the actual sales will go in same direction that of budgeted sales.

Regression analysis is used as a tool of determining the strength of relationship between two variables. It is a statistical tool, with the help of which we can estimate or predict the value of one variable when the value of other variable is known. Here, a regression line also can be fitted to show the degree of relationship between the budgeted and actual sales and to estimate the possible actual sales for the coming year with given budgeted sales for the year, we may assume that sales depends upon budgets. As we assumed actual sales as Y and budgeted sales as X, the regression equation of actual sales (Y) on budgeted sales (X) is as follows.

$$Y - \bar{Y} = r_{xy} \frac{\delta y}{\delta x} (X - \bar{X}) \dots\dots\dots(i)$$

Mean	$(\bar{X}) = 179184.60$	$\bar{Y} = 361167.40$
S.D	$\delta x = 35942.688$	$\delta y = 208229.768$

Then, substituting the corresponding value in equation (i), we can get,

$$Y - 361167.40 = 0.63 \times \frac{208229.768}{35942.688} (X - 179184.60)$$

$$\text{Or, } Y = 3.65 (X - 179184.60) + 361167.40$$

$$\text{Or, } Y = 3.65X - 654023.79 + 361167.40$$

$$\text{Or, } Y = 3.65X - 292856.39 \dots\dots\dots (ii)$$

Thus the regression equation shows that there is negative relationship between target and actual sales achievement. With this regression equation, we can ascertain the expected sales achievement with given value of target sales, say X, if we use this equation to Ascertain the expected sales achievement for fiscal year 2071/072, the following result is achieved.

For example, the budgeted sales lines for F.Y. 2071/072 are 225568 lines. From this we can achieve the expected sales as follows. i.e.,

$$\begin{aligned} Y &= 3.65X - 292856.39 \\ &= 3.65 \times 225568 - 292856.39 \\ &= 530466.81 \text{ lines} \end{aligned}$$

If the relationship between budgeted and actual sales remains in same direction as previous year, the actual sales for the F.Y. 2071/072 will be 530466.81 lines.

4.5.2 Analysis of Targeted and Actual Sales of PSTN Tel. Service

Table: 4.16

Statistical Information Table of Target and Actual Sales Lines of PSTN Tel. Service

Statistical Tools	Targeted Sales Lines	Actual sales Lines
Mean	63773.20	44727.20
Standard Deviation (δ)	6788.30	10241.52
Coefficient of Variation (CV)	10.64%	22.89%
Correlation (r)	0.827	

Probable Error (P.E)	0.2995
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Source: Appendix II

As stated on statistical information table no. 4.14. Mean and S.D. of target sales is greater than actual sales of PSTN Tel. Service. But the coefficient of variation (C.V.) of actual sales is more than budgeted sales. It shows the higher variability and less uniformity, consistency in actual sales than budgeted sales. For the calculation of correlation Coefficient(r), budgeted sales figure of PSTN Tel.Lines are assumed as independent variable(X) and actual sales figure of PSTN Tel. Lines is assumed as dependent variable (Y). From above table there is positive correlation between budgeted and actual sales in units. It indicates that actual sales increase as target sales increase. The significant of r is tested with probable error. r is more than PE (r) so it may conclude that value r of is significant. So the actual sales will go on same direction that of budgeted sales.

To find regression equation, actual sales units of PSTN Tel. Lines are assumed as Y and budgeted sales units of PSTN Tel. Lines are assumed as X, the regression equation of actual sales (X) of PSTN Tel. Service is as follows.

$$Y - \bar{Y} = r_{xy} \frac{\delta y}{\delta x} X - \bar{X} \dots\dots\dots(i)$$

Mean $(\bar{X}) = 63773.20$ $\bar{Y} = 44727.20$

S.D $\delta x = 6788.30$ $\delta y = 10241.52$

Then, substituting the corresponding value in equation (i), we can get,

$$Y - 44727.20 = 0.827 \times \frac{10241.52}{6788.30} (X - 63773.20)$$

$$\text{Or, } Y = 1.248 (X - 63773.20) + 44727.20$$

$$\text{Or, } Y = 1.248X - 63773.20 + 44727.20$$

$$\text{Or, } Y = 1.248X - 19046 \dots\dots\dots (ii)$$

This regression equation shows positive relationship between target and actual sales achievement. It shows that actual sales are in increasing trend and the actual sales will be increased by 1.248 units (lines) as per units (lines) increase in budgeted sales.

By the help of the regression equation (ii) we can estimate the expected sales achievement with given value of budgeted sales (X) for F./Y 2071/072. If we use the equation (ii) the expected sales achievement (Y) will be as follows.

Let, the budgeted sales units (lines) for F/Y 2071/072 = 79670

Then substituting the value of X (in '000' lines) = 79670

Expected sales achievement

$$\begin{aligned} Y &= 1.248X - 19046 \\ &= 1.248 \times 79670 - 1046 \\ &= 80382.16 \approx 80382 \text{ lines} \end{aligned}$$

Thus, if relationship between actual sales and budgeted sales of PSTN Tel. Service remain same as previous year, then sales for FY 2071/072 will be 80382 lines as stated by above regression equation.

4.6 Trend Analysis

Trend Analysis shows the relationship between two variables on a single period. It helps in future forecasting and planning with the help of past and present data and the factors affecting them will make possible to forecast the future magnitude. A widely and most commonly used method to described the trend is the method of least square. The trend line obtained from this method gives the line of best fit and with this method; prediction of the values for the future is possible. This method show the relationship between time (years) and actual sales of the relevant years. In this method, it is assumed that sales are consistently changing in time and such change can be expressed by competent

of time series. To fit the straight line, the time factor is considered as independent factor (X) and actual sales is considered as dependent variable (Y) upon time. Let, the trend line between the dependent variable Y (ie Actual sales) and the independent variable X (i.e. Time) be represent by;

$$Y = a + bX \dots \dots (i)$$

Where,

Y = Actual Sales

X = Time (year)

Then for any given value of independent variable x, the estimate value of Y denoted by Yc given by above equation is

$$Yc = a+bx \dots \dots (iii)$$

a = Y intercept or value of Y when X = 0

b = slope of the trend line or amount of change that comes in Y for a unit change in X.

4.6.1 Trend Analysis of Total Actual Sales and PSTN Tel. Service Sales Line

Under this topic, trend values of the total actual sales and actual sale line of PSTN service of NTC for the period of study has been calculated and forecasted for the next 5 years, from 2071/072 and 2075/076.

Table: 4.17

Trend Values of Total Sales and PSTN Sales Line of NTC (In Lines)

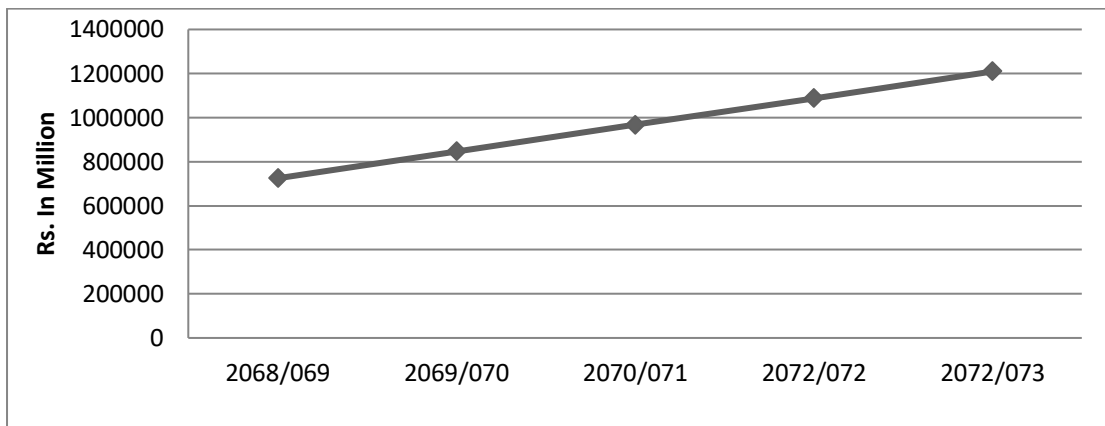
Fiscal Year	Components	
	Total Sales Line	PSTN Sales Line
2071/072	724591	58950
2072/073	845733	63691
2073/074	966874	68432
2074/075	1088015	73173
2075/076	1209157	77914
Mean (a)	361167	44727

Rate of Change (b)	121141	4741
Trend Equation(Y)	$Y = 361167.4 + 121141.4X$	$Y = 44727.2 + 4741.10X$

Source: Appendix III & IV

Figure: 4.12

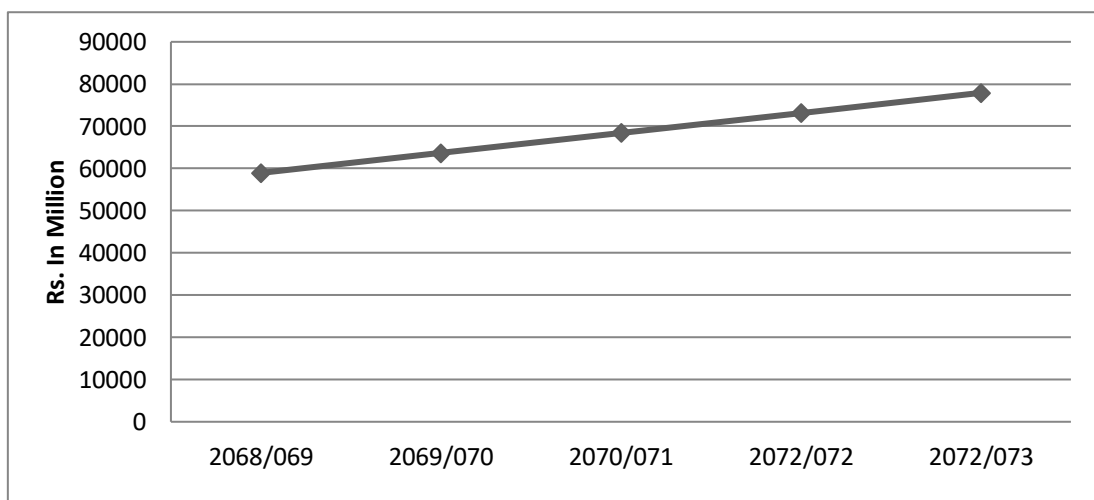
Forecasted Trend Line of Total Sales Line



Above table 4.17 and figure 4.12 shows the increasing trend of total sales line of NTC. 'Y' has shown the trend value of total sales. Since, the calculated value of 'b' is positive; it is found that the NTC's total sale is increasing with time. It shows that the total sales line increasing by 121141 every year. On the basis of this calculation, it can be forecasted that the NTC's total sales line will be 724591 in the year 2071/072 and it will be 1209157 in the year 2075/076.

Figure: 4.13

Forecasted Trend Line of PSTN Tel. Service Sales Line



Above table 4.17 and figure 4.13 shows the increasing trend of PSTN tel. service sales line of NTC. 'Y' has shown the trend value of PSTN tel. service sales line. Since, the calculated value of 'b' is positive; it is found that the NTC's PSTN tel. service sales line is increasing with time. It shows that the PSTN tel. service sales line increasing by 4741 every year. On the basis of this calculation, it can be forecasted that the NTC's PSTN tel. service sales line will be 58950 in the year 2071/072 and it will be 77914 in the year 2075/076.

4.7 Major Findings

On basis of different analysis, observation and informal discussion the following major finding have been drawn.

- BE sale in fluctuating each year during the study period, the highest increment is 118.31% in the fiscal year 2069/070 and that of lowest is 63.41% in the fiscal year 2067/068.
- Contribution margin ratio is increase by 7.15% in the fiscal year 2067/068 and decrease by 3.58% in the fiscal 2069/070 than previous year.
- Fixed cost is higher than variable cost each year during the study period and the increasing rate of fixed cost is high than variable cost.
- It is found that there is great achievement of revenue collection in ISTD sector every year.
- Net profit is increasing each year but increasing rate is low in the current year than previous year and the achievement rate is increases in the current year.
- Profit volume ratio is greater than 88% in each fiscal year during the study period.
- The actual sales units of PSTN telephone service of NTC is fluctuated every year.

- The cost volume profit analysis of NTC shows that BEP (Break Even Point) is satisfactory.
- The highest increment in margin of safety is 30.84% in the fiscal year 2067/068 than previous year and that of lowest is 9.18% in the fiscal year 2070/071.
- The proportion of profit on total sales revenue is more than 60% in each year.
- The PSTN tel. service sales line increasing by 4741 every year. It can be forecast that the NTC PSTN tel. service sales line will be 58950 in the year 2072/072 and it will be 77914 in the year 2075/076.
- The sales revenue per employ is in increasing trend except the FY 2067/068.
- The total actual sales units of NTC are in increasing trend. Actual sales revenue is always higher than target except F.Y. 2069/070 & 2070/071.
- The total sales line increasing by 121141 every year. It can be forecast that the NTC's total sales line will be 72459 in the year 2071/072 and it will be 1209157 in the year 2075/076.
- There is high degree of positive correlation of targeted and actual sales lines and PSTN sales units. The regression equation and straight line of trend shows increasing trend of overall sales.
- There is no proper practice of cost segregation into fixed and variable cost and there is no systematic approach to record manufacturing costs.
- Variable cost ratio is decrease by 62.15% in the fiscal year 2067/068 than precious year and increase by 72.86% in the fiscal year 2069/070 than previous year.

- Variable cost ratio is not more than 11% in each fiscal year during the study period.

CHAPTER - V

SUMMARY, CONCLUSIONS & RECOMMENDATIONS

5.1 Summary

In Nepal public enterprises were established with the objectives of accelerating the rate of economic growth, mobilization of economic growth, mobilization of available resources, generate employment profit necessary for the development of the country. But creating new Nepal is possible only when the political and economical situation could be favorable for development situation could be favorable for development of country. We can not imagine the concept of new Nepal in a present state of crisis, fundamentally rooted in a failure of productive organization associated with its economic and political under development. Most of the public enterprises ineffectiveness due to lack of managerial efficiency for appropriate planning and control.

Sales plan or budget is first and important step in developing the overall budget procedure. Sales planning are the starting point in preparation of corporate profit planning and control. All the plans or budgets depend upon the sales budget. After having the planning premises of the organization the sales plan is developed, sales plan is the first plan or budget of profit plan. Profit planning is closely related with planning the sales, so sales plan plays every importance

role in profit plan. Hence it is called and means of profit plan, which is the source of production for periodic planning in the firm planning practically all other enterprises planning, are built on it the primary source of cash is sales in any enterprises. All the business operations are directly linked with the sales budget and sales budget must be realistic. If the sales plan is not realistic, all the other elements of profit plan will be out of reality.

Nepal Telecom is a public utility concern entity, which is a leading corporation in the sector of telecommunication was established under the communication corporation act 2028. To provide essential national wide low cost reliable and readily available telecommunication service to the general public, government offices, business organization and the country as a whole there by supporting for the country. Public enterprises are strong means to develop infrastructure. It helps to provide required goods and service anthem country. But majority of the Nepalese PES has failed to achieve financial capability and work efficiency and are still the depend on government grants. That is why the comprehensive profit planning is not practiced and implementation of sales plan and control and its effectiveness in Nepalese non manufacturing public enterprises. For this purpose Nepal Telecom (NTC) is selected as sample PE for the study. The main objective of the study is to evaluate the current practice of sales plan and control and its effectiveness in Nepalese non-manufacturing public enterprises Nepal Telecom. It has tried to answer of certain questions started in the statement of problem.

This study has tried to examine the sales followed by NTC and scope of the study is limited for five years FY 2066/067 to 2071/072 B.S. The study design of this study descriptive and analytical and research data has been collected mainly from secondary source. Related literature has been reviewed from the books, reports, thesis, government publications, journals, bulletin etc. statistical tools like mean, standard deviation, coefficient of variation correlation, regression etc. have been used to analyze the data. Similarly, financial tools CVP analysis, variance analysis has been also used. The collected data has

been also presented with the help of table, chart and diagram. This study has been organized in five main chapters i.e., introduction, literature review, research methodology, presentation and analysis of data and summary, major finding and recommendations.

5.2 Conclusions

After analyzing the practice of sales planning of NTC it is concluded that, NTC prepares both long term and short term profit plans but the long term profit plan is confined only to top level. Long range sales planning of NTC are not shown according to category of consumer and time wisely. The overall actual sales lines are in increasing trend and it exceed target except in FY 2069/070 & 2070/071, but actual sales revenue of NTC is always higher than budget. Correlation analysis shows the high degree of positive correlation between actual and budgeted sales in units and actual & budgeted sales unit of PSTN telephone service. NTCs budget is not realistic to its sales and production achievement. Idle capacity of installed telephone lines is as increasing trend. Which affects to generate revenue.

Cost-Volume-profit analysis shows that BEP is satisfactory but C.V relationship is not consider while developing the sales plan. There in not clear cut boundaries to separate cost into fixed and variable. The concept of variance analysis ignored in the company, it gives negative impacts on the sales planning of the company. NTC fail to analyze its strengths and weakness in depth because of the absence of the competitors, it has become monopolistic consents concern and hence it is not alert towards its possible threats and opportunities.

5.3 Recommendations

After analysis of sales planning of NTC, some suggestions have been recommended on the basis of the major findings of the study.

- Sales budget should be made on realistic ground because all other functional budgets depend upon sale budget. Basis of setting target for sales and production should be defined carefully. Thus, the realistic long range, medium range and short range forecast should be made.
- It should be strongly suggested to establish a separate costing department as well as a separate costing system so as to segregate cost into fixed, variable, controllable, uncontrollable, direct, indirect etc. This will help to make the control system very effective and dynamic. On the other hand, it will help to reduce unnecessarily increasing cost.
- When preparing the sales plan, NTC has not practice of CVP analysis, which brings problem in providing services. It should be necessary to know that what the less profit at level is. So, NTC should prepare the CVP analysis.
- Favourable and unfavorable variances should be controlled in time and respective officials should be made responsible for any deficiency.
- The sales plan of NTC should make on the basis of performance of company ability because maximum plan based on adhoc basis.

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Appendix I

Calculation for Mean value, Standard Deviation & Correlation between Targeted Sales & Actual Sales in Line of NT

Year	Targeted (X ₁)	Actual (X ₂)	x ₁ =X ₁ - \bar{X}_1	x ₂ =X ₂ - \bar{X}_2	x ₁ · x ₂	x ₁ ²	x ₂ ²
2066/067	116,171	164885	-63,013.60	-196,282.40	12,368,460,640.64	3,970,713,784.96	38,526,780,549.76
2067/068	189,433	115,531	10,248.40	-245,636.40	-2,517,380,081.76	105,029,702.56	60,337,241,004.96
2068/069	186,895	430,868	7,710.40	69,700.60	537,419,506.24	59,450,268.16	4,858,173,640.36
2069/070	198,767	532,391	19,582.40	171,223.60	3,352,969,024.64	383,470,389.76	29,317,521,196.96
2070/071	204,657	562,162	25,472.40	200,994.60	5,119,814,849.04	648,843,161.76	40,398,829,229.16
N ₁ = 5 N ₂ = 5	∑ X ₁ = 895,923	∑ X ₂ = 1,805,837	-	-	∑ x ₁ · x ₂ = 18,861,283,938.80	∑ x ₁ ² = 5,167,507,307.20	∑ x ₂ ² = 173,438,545,621.20

For Targeted Sales,

$$\text{Mean } (\bar{X}_1) = \frac{\sum X_1}{N_1} = \frac{895923}{5} = 179184.60$$

$$\text{Standard deviation } (\sigma_1) = \sqrt{\frac{\sum (X_1 - \bar{x}_1)^2}{N_1 - 1}} = \sqrt{\frac{5167507307.20}{5-1}} = 35942.668$$

For Actual Sales,

$$\text{Mean } (\bar{X}_2) = \frac{\sum X_2}{N_2} = \frac{1805837}{5} = 361167.40$$

$$\text{Standard deviation } (\sigma_2) = \sqrt{\frac{\sum (X_2 - \bar{x}_2)^2}{N_2 - 1}} = \sqrt{\frac{173438545621.20}{5-1}} = 208229.768$$

Correlation between Targeted & Actual Sales in Lines,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}$$

$$= \frac{18861283938.80}{\sqrt{5167507307.20 \times 173438545621.20}} = 0.63$$

$$r^2 = 0.63^2 = 0.397$$

Coefficient of Variation of Targeted Sales,

$$CV = \frac{\bar{X}_1}{\sigma_1} = \frac{179184.60}{35942.668} = 20.05\%$$

Coefficient of Variation of Actual Sales,

$$CV = \frac{\bar{X}_2}{\sigma_2} = \frac{361167.40}{208229.768} = 57.65\%$$

For Probable Error,

$$PE = 0.6745 \times \frac{1-r^2}{\sqrt{N}} = 0.6745 \times \frac{1-0.397}{\sqrt{5}} = 0.18 \text{ Or, } 18\%$$

Appendix II

Calculation for Mean value, Standard Deviation & Correlation between Targeted Sales & Actual Sales in Line of NT

Year	Targeted (X_1)	Actual (X_2)	$x_1 = X_1 - \bar{X}_1$	$x_2 = X_2 - \bar{X}_2$	$x_1 \cdot x_2$	x_1^2	x_2^2
2066/067	55,696	36601	-8,077.20	-8,126.20	65,636,942.64	65,241,159.84	66,035,126.44
2067/068	60,083	45,058	-3,690.20	330.80	-1,220,718.16	13,617,576.04	109,428.64
2068/069	61,895	32,522	-1,878.20	-12,205.20	22,923,806.64	3,527,635.24	148,966,907.04
2069/070	68,494	53,239	4,720.80	8,511.80	40,182,505.44	22,285,952.64	72,450,739.24
2070/071	72,698	56,216	8,924.80	11,488.80	102,535,242.24	79,652,055.04	131,992,525.44
$N_1 = 5$ $N_2 = 5$	$\Sigma X_1 =$ 318,866	$\Sigma X_2 =$ 223,636	-	-	$\Sigma x_1 \cdot x_2 =$ 230,057,778.80	$\Sigma x_1^2 =$ 184,324,378.80	Σx_2^2 419,554,726.80

For Targeted Sales,

$$\text{Mean } (\bar{X}_1) = \frac{\Sigma X_1}{N_1} = \frac{318866}{5} = 63773.20$$

$$\text{Standard deviation } (\sigma_1) = \sqrt{\frac{\Sigma (X_1 - \bar{X}_1)^2}{N_1 - 1}} = \sqrt{\frac{184324378.80}{5-1}} = 6788.31$$

For Actual Sales,

$$\text{Mean } (\bar{X}_2) = \frac{\sum X_2}{N_2} = \frac{223636}{5} = 44727.20$$

$$\text{Standard deviation } (\sigma_2) = \sqrt{\frac{\sum (X_2 - \bar{X}_2)^2}{N_2 - 1}} = \sqrt{\frac{419554726.80}{5-1}} = 10241.52$$

Correlation between Targeted & Actual Sales in Lines,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}$$

$$= \frac{230057778.80}{\sqrt{184324378.80 \times 419554726.80}} = 0.83$$

$$r^2 = 0.83^2 = 0.68$$

Coefficient of Variation of Targeted Sales,

$$CV = \frac{\bar{X}_1}{\sigma_1} = \frac{63773.20}{6788.31} = 10.64\%$$

Coefficient of Variation of Actual Sales,

$$CV = \frac{\bar{X}_2}{\sigma_2} = \frac{44727.20}{10241.52} = 22.89\%$$

For Probable Error,

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.6745 \times \frac{1 - 0.68}{\sqrt{5}} = 0.10 \text{ Or, } 10\%$$

Appendix III

Trend Analysis of Total Actual Sales Line

The trend line $Y = a + bX$ ----- (A)

Let's assume that middle year be 3, then $X = t - 3$

Year	t	Total Sales Line (Y)	X= t-3	XY	X ²
2066/067	1	164885	-2	-329770	4
2067/068	2	115531	-1	-115531	1
2068/069	3	430868	0	0	0

2069/070	4	532391	1	532391	1
2070/071	5	562162	2	1124324	4
		$\Sigma y = 1805837$	$\Sigma X = 0$	$\Sigma xy = 1211414$	$\Sigma x^2 = 10$

Since, $\Sigma X = 0$

The two normal equations obtained from the above equations will be

$$\Sigma Y = na \quad \text{----- (i)}$$

$$\Sigma XY = b\Sigma X^2 \quad \text{----- (ii)}$$

Since, n = number of years under study = 5, the value of 'a' and 'b' can be calculated by solving equation (i) and (ii).

From equation (i)

$$\Sigma Y = na$$

$$\text{Or, } 1805837 = 5 \times a$$

$$\text{Or, } a = 361167.4$$

Again, from equation (ii)

$$\Sigma XY = b\Sigma X^2$$

$$\text{Or, } 1211414 = b \times 10$$

$$\text{Or, } b = 121141.4$$

Now, putting the value of 'a' and 'b' in the equation of trend line,

$$Y = a + bX$$

$$\text{Or, } Y = 361167.4 + 121141.4X$$

Forecasted Trend Value of Total Sales Line

Year	X	Trend Value
		Total Sales (Y) = 361167.4 + 121141.4X
2071/072	3	$361167.4 + 121141.4 \times 3 = 724591.6$
2072/073	4	$361167.4 + 121141.4 \times 4 = 845733$
2073/074	5	$361167.4 + 121141.4 \times 5 = 966874.4$
2074/075	6	$361167.4 + 121141.4 \times 6 = 1088015.80$
2075/076	7	$361167.4 + 121141.4 \times 7 = 1209157.2$

Appendix IV

Trend Analysis of Total Actual PSTN Sales Line

The trend line $Y = a + bX$ ----- (A)

Let's assume that middle year be 3, then $X = t - 3$

Year	t	PSTN Sales Line (Y)	X= t-3	XY	X ²
2066/067	1	36601	-2	-73202	4
2067/068	2	45058	-1	-45058	1
2068/069	3	32522	0	0	0
2069/070	4	53239	1	53239	1
2070/071	5	56216	2	112432	4
		$\sum y = 223636$	$\sum X = 0$	$\sum xy = 47411$	$\sum x^2 = 10$

Since, $\sum X = 0$

The two normal equations obtained from the above equations will be

$$\sum Y = na \quad \text{----- (i)}$$

$$\sum XY = b\sum X^2 \quad \text{----- (ii)}$$

Since, n = number of years under study = 5, the value of 'a' and 'b' can be calculated by solving equation (i) and (ii).

From equation (i)

$$\sum Y = na$$

$$\text{Or, } 223636 = 5 \times a$$

$$\text{Or, } a = 44727.2$$

Again, from equation (ii)

$$\sum XY = b \sum X^2$$

$$\text{Or, } 47411 = b \times 10$$

$$\text{Or, } b = 4741.10$$

Now, putting the value of 'a' and 'b' in the equation of trend line,

$$Y = a + bX$$

$$\text{Or, } Y = 44727.2 + 4741.10X$$

Forecasted Trend Value of PSTN Tel. Service Sales Line

Year	X	Trend Value
		Total Sales (Y) = 44727.2 + 4741.10X
2071/072	3	44727.2 + 4741.10 × 3 = 58950.5
2072/073	4	44727.2 + 4741.10 × 4 = 63691.6
2073/074	5	44727.2 + 4741.10 × 5 = 68432.7
2074/075	6	44727.2 + 4741.10 × 6 = 73173.8
2075/076	7	44727.2 + 4741.10 × 7 = 77914.9