Third Year Degree Course In

NMU

Mech. / Auto. Engineering (SEM - VI)

PROJECT AND BUSINESS MANAGEMENT

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M. V. RAWLANI

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NIRALI PRAKASHAN
ADVANCEMENT OF KNOWLEDGE

A Text Book Of

PROJECT AND BUSINESS MANAGEMENT

For
SEMESTER - VI

THIRD YEAR DEGREE COURSE IN MECHANICAL/AUTOMOBILE ENGINEERING

As Per New Revised Syllabus of North Maharashtra University, Jalgaon (Effective From 2015)

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PREFACE

It gives us immense pleasure to present this book on **"Project and Business Management"**.

This book is written mainly for the Third Year Students of Mechanical and Automobile Engineering of North Maharashtra University, Jalgaon.

The text book has been thoroughly prepared according to Five Units as per revised curriculum of 2014. The authors with their professional and academic experience have taken all efforts to present the text in lucid manner. The theoretical matter has been explained with number of diagrams and illustrations.

The objectives of this text are :

Unit I : It includes Introduction to project management and Concepts of project scheduling.

Unit II : It includes Introduction to network technique and Application of network analysis.

Unit III : It includes Introduction to business management and Concepts of co-operative organization.

Unit IV : It includes Introduction to financial management and Concepts of cost and cost control.

Unit V : It includes Scope of material management and Introduction to inventory management.

We thank this opportunity to express our thanks to Shri Dineshbhai Furia, Shri Jignesh Furia and Shri Mallikarjun P. Munde and all the staff members of Nirali Prakashan namely, Mrs. Deepali Lachake (Co-ordinator), Mrs. Manasi Pingle, Mrs. Anjali Muley and Mr. Ilyas Shaikh for their tremendous dedication and hard work in bringing out this book in an excelling form.

We are also thankful to P. M. More, Branch Manager, Jalgaon Office for his valuable help and efforts for promotion of our book.

Our special thanks to our family members, student and all those who directly or indirectly supported us in this project.

Any suggestions and feedback shall be appreciated and acknowledged.

Authors

SYLLABUS

Unit 1: **(No. of Lecture 08; Marks 16)**

Project Management

(a) Introduction to project management, Concept of project management, Managerial function at different organizational levels, Types of projects.

(b) Project identification, Scheduling, Monitoring, Control, Basic tool and techniques for projects scheduling Bar chart, Project life cycle curves, Line balancing, Problems on line balancing.

Unit 2: **(No. of Lecture 08; Marks 16)**

Project Statistic Technique

(a) Introduction of network technique, Fundamental concept and network models, Construction of network diagrams.

(b) Application of network analysis, Definition of PERT and CPM, Comparison between CPM and PERT, Critical path method with problem, Programme evaluation and review techniques with problem, Time cost problem (crash) with PERT.

Unit 3: **(No. of Lecture 08; Marks 16)**

Business Management

(a) Introduction to management, Concept of management, The function of management, Importance of management, Forms of business organization, Concept of ownership organization, Types of ownership, Individual ownership, Partnership organization, Joint stock companies, Types of stock companies.

(b) Co-operative organizations, Various types of co-operative societies, Public sector organization, State ownership, Public co-operation, Choice of form of organisation, Comparative evaluation of different forms of business ownership.

Unit 4: **(No. of Lecture 08; Marks 16)**

Financial Management

(a) Introduction, Definition of financial management, Functions of financial management, Sources of funds, Capital, Classification of capital, Working capital, Need for working capital, Assessment of working capital, Factors affecting working capital, Sources of finance (Shares, Debentures, Loans from banks, Trade credit, Public deposits, Financial institutions).

(b) **Cost and Cost Control:** Elements of cost, Direct cost, Indirect cost, Variable and fixed cost, Cost control technique, Marginal costing, Break even analysis.

Unit 5: **(No. of Lecture 08; Marks 16)**

Material and Purchase Management

(a) Scope of material management, Function of material management, Objectives of scientific purchasing, Functions of purchase department, 5R's of buying, Methods of buying, Source selection (vendor), Vendor rating, Just in time purchasing.

(b) Inventory management, Objective of inventory management, Types of inventory, Selective inventory technique (ABC, VED), Inventory model (Economic lot size with fixed price, EOQ with quantity discount).

CONTENTS

UNIT-I

PROJECT MANAGEMENT

1.1 INTRODUCTION TO PROJECT MANAGEMENT

Project management is an emerging profession. The *concept of project management* is "a set of principles, methods and techniques that helps in the effective planning and completion of task under the given constraints imposed on a project". A project management is in great demand. A number of organizations, industries, business establishments, agricultural rural developments are releasing advertisements in various media for recruitment of project professionals. Government has been investing large amount of funds in infrastructure projects like railway, road, airport, power, bridges, dams, canal, housing complex, textiles through private participation. The formulation of sound project is of significance in industrial development of any planned economy. A systematic evaluation of existing and proposed projects based on thorough investigation of their economic and technical feasibility is a pre-requisite of selecting viable projects and providing financial and technical resources to them. Project formulation and evaluation are important in a developing country like India because of limited resources in capital and skills. Project identification and selection are essential for analysis and planning of the project.

1.2 CONCEPT OF PROJECT

The project is the beginning of all economic, business, social, welfare and administrative activities. Project involves many activities. Thus, any activity passes through the various stages. Generally, activity associated with planning, organizing, co-ordinating, monitoring and controlling, so as, finally achieve the end objective i.e. completion of the project.

The concept of project management underlines a set of principles and techniques that assists in the effective planning and completion of the task under all constraints. Generally, project generates the revenue for the future period. So that, systematic planning and analysis of project is more significant.

Project may be defined as "planning and management task for various activities for the completion of final work".

Project is a plan for arranging, co-ordinating, supervising, monitoring and completion of various activities related to the final objective.

There are various types of project like steel project, cement project, power plant project, refinery project, fertilizer project, construction of dam and bridges. Every project involves definite objectives, strategies and specific time period.

A project consist of investments of funds for developing facilities to generate goods and services. A project may involve establishment of new plant or expansion of existing plant. Whatever may be the project, it consists of consumption of resources and produces goods and services.

The project management, USA defines "the project is a system involving the co-ordination of a number of separate department entities through the organization and which must be completed within prescribed schedules and time constraints". It also describes the project as a combination of human and non-human resources pooled together in a temporary organization to achieve an objective.

1.3 CLASSIFICATION OF PROJECT

The project can be classified on the basis of location, type, technology, size, scope and speed of the project. Fig. 1.1 shows the various types of project.

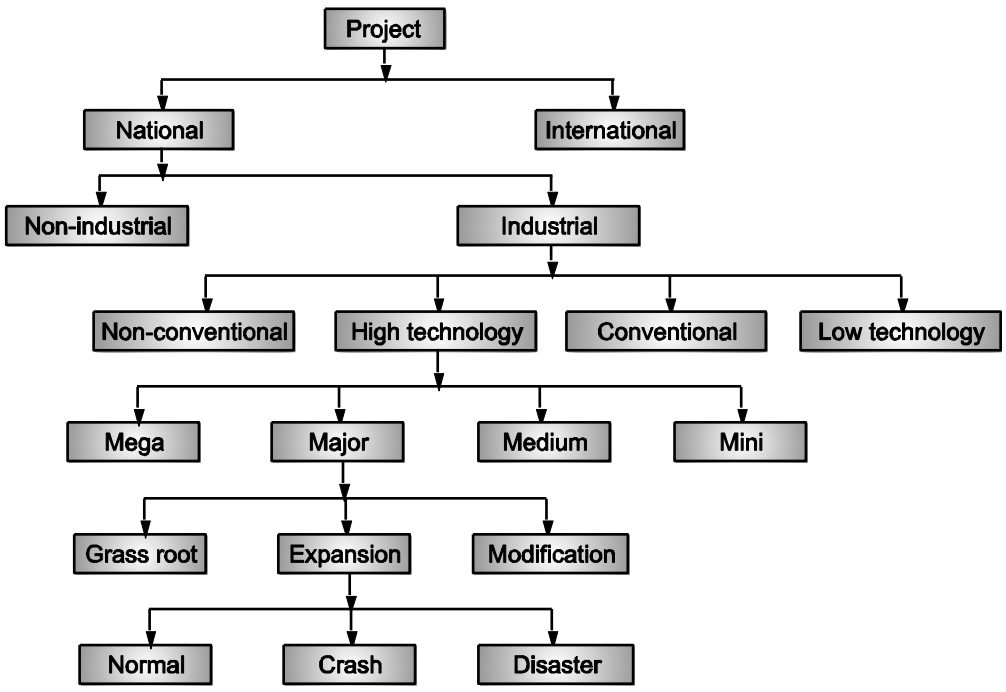

Fig. 1.1

National project is located in rural or urban area within the country, and project located in abroad is called as international project.

Industrial projects convert the raw material into the goods. And non-industrial projects are related to services. They provide the services to the society, organization etc.

Industrial projects are classified on the basis of technology used i.e. Non-conventional energy base projects like solar, wind etc., High technology base projects i.e. computer integrated system, and Conventional and low technology base projects.

Projects are also classified on the basis of size of the project like Mega size , Major size, Medium and Mini size etc.

Major projects are also defined by their scope i.e. grass root projects, expansion projects and modification projects. Depending on the speed required for execution of a project, these can be further classified as :

(a) Normal projects

(b) Crash projects

(c) Disaster projects.

(a) Normal Projects : In this category of projects, adequate time is allowed for implementation of the project. All the phases in a project are allowed to take the time they should normally take. This type of project will require minimum capital and no sacrifice in terms of quality.

(b) Crash Projects : In this category of projects, additional capital costs are incurred to gain time. Maximum overlapping of phases is encouraged and compromises in terms of quality are also not ruled out. Saving in time is normally achieved in procurement and construction where time is bought from the vendors and contractors by paying extra money to them.

(c) Disaster Projects : Any thing needed to gain time is allowed in these projects. Engineering is limited to make them work. Quality short of failure level is accepted. Vendors who can supply 'yesterday' are selected irrespective of the cost. No competitive bidding is resorted to. Round the clock work is done at the construction site. Normally, capital cost will go up very high, but project time will get drastically reduced.

1.13.1 Characteristics of a Project

1. **Objectives :** A project has a fixed set of objectives. Once the objectives have been achieved, the project ceases to exist.
2. **Life Span :** A project cannot continue endlessly. It has to come to an end.

3. **Single Entity :** A project is one entity and it is normally entrusted to one responsibility centre while the co-ordinates in the project are many.
4. **Team Work :** A project call for team work, the team is constituted of members belonging to different disciplines, organizations and even countries.
5. **Uniqueness :** No two projects are exactly similar even if the plants are exactly identical. The location, the infrastructure, the agencies and the people make each project unique.
6. **Made to Order :** A project is always made to the order of its customer. The customer stipulates various requirements and puts constraints within which the project must be executed.
7. **Life Cycle :** A project has a life cycle reflected by growth, maturity and decay.
8. **Unity of Diversity :** A project is a complete set of thousands of varieties. The varieties in terms of technology, equipments and materials, machinery and people, work culture and ethics. But they are interrelated activities.
9. **Sub-contracting :** A high percentage of the work in a project is done through a contractors. Normally 80% of the work in a project is done through sub-contractors.
10. **Risk and Uncertainty :** Every project has risk and uncertainty associated with it.

1.4 CONCEPT OF PROJECT MANAGEMENT

Project management is concerned with defining project activities, maintaining their integrity and ensuring that they are performed as desired, within the allocated time and cost budgets, using all organizational and extra organizational resources. Project management can be defined as "planning, scheduling and controlling the project to achieve the objectives economically and effectively".

Steps in Project Management :

Project management approach basically consists of the following five steps :

1. Grouping work into packages which acquires the properties of a project. This means that the works so grouped are related to each other, contribute to the same goals and can be bound by definite time, cost and performance targets.
2. Entrusting the whole project to a single responsibility centre known as the project manager, for co-ordinating directing and controlling the project.
3. Supporting and servicing the project internally within the organization by matrixing or through total projectization and externally through vendors and contractors.

4. Building up commitment through negotiations, co-ordinating and directing towards goals through schedules, budgets and contracts.
5. Ensuring adherence to goals through continuous monitoring and control using schedule, budget and constructs as the basis.

1.5 MANAGERIAL FUNCTION AT DIFFERENT ORGANIZATIONAL LEVELS (WORK BREAKDOWN STRUCTURE)

A project management system provides a frame work for launching and implementing project activities within an organization. A good system appropriately balances the needs of both the parent organization and the project by defining the interface between the project and parent organization in terms of authority, allocation of resources and eventual integration of project outcomes into mainstream operations.

An organization chart, is the simplest and quickest way to demonstrate the project management authority. Details such as where a project manager is positioned, to whom he reports, those with whom he communicates and all those who report to him, will tell much about a project manager's authority but not in very clear terms.

1.5.1 Project Manager as a Staff Assistant to the Chief Executive

Fig. 1.2 shows an arrangement in which the project manager is a staff assistant to chief executive. The project manager in this position does not make any decision for the project, nor does he provide any staff service to the functional departments who make all the decisions relating to the project. The project manager merely collects information and communicates the same to the chief executive. This arrangement may be chosen by a chief executive who wants to directly control the project but cannot devote much time to keep track of details.

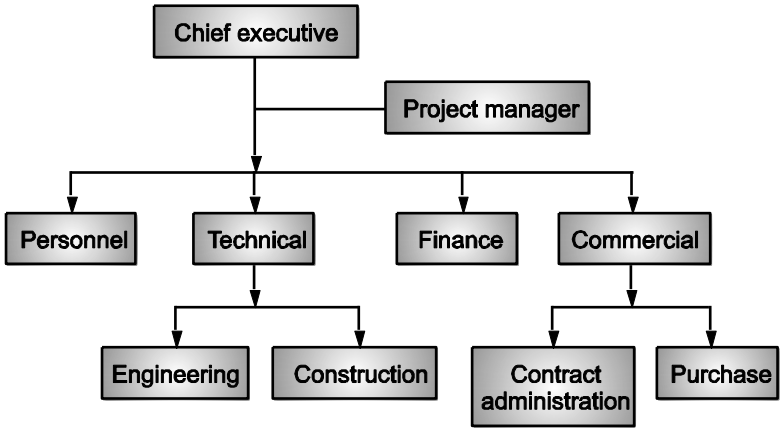

Fig. 1.2

1.5.2 Project Manager as a Specialized Staff Function

The project manager in this case will be a specialist in project management tools and techniques, and in view of his superior knowledge relating to scheduling, budgeting and information systems, he is in the best position to advise other functions. A project manager in this role can also carry out service activities like collection and transmission of data, follow up of one functional group to service another group, maintain records, measure progress, analyse progress and prepare progress reports. He may advise the functional groups but a final decision would rest with the functional groups. He does not have any authority which can shape the destiny of a project.

Most of companies tend to use this arrangement when project management is used for the first time in the company, as this does not require much change in the working of the organization.

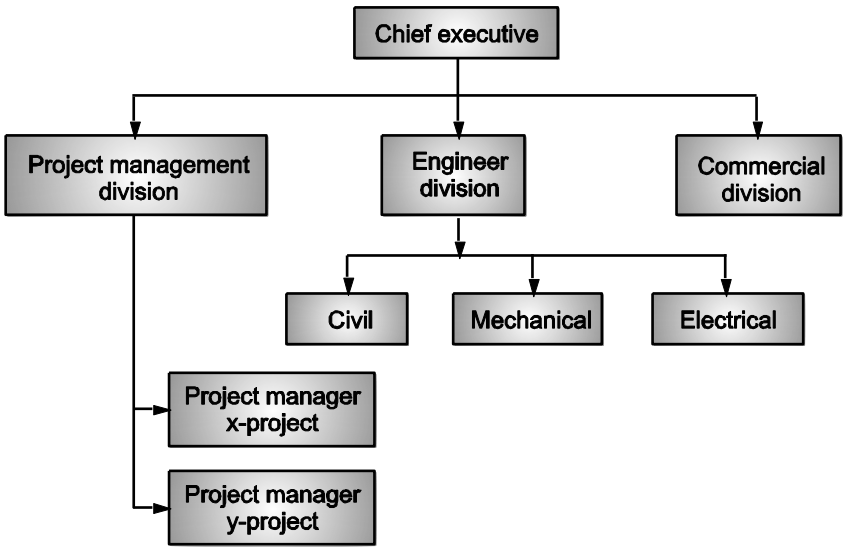

Fig. 1.3

1.5.3 Matrix Organization

Fig. 1.4 shows a matrix organization. In this organization, the personnel working on the project have a responsibility to their functional superior as well as to the project manager. In a matrix system, there are usually two chains of command, one along functional lines and the other along project lines. Instead of delegating segments of a project to different units or creating an autonomous team, project participants report simultaneously to both functional and project managers.

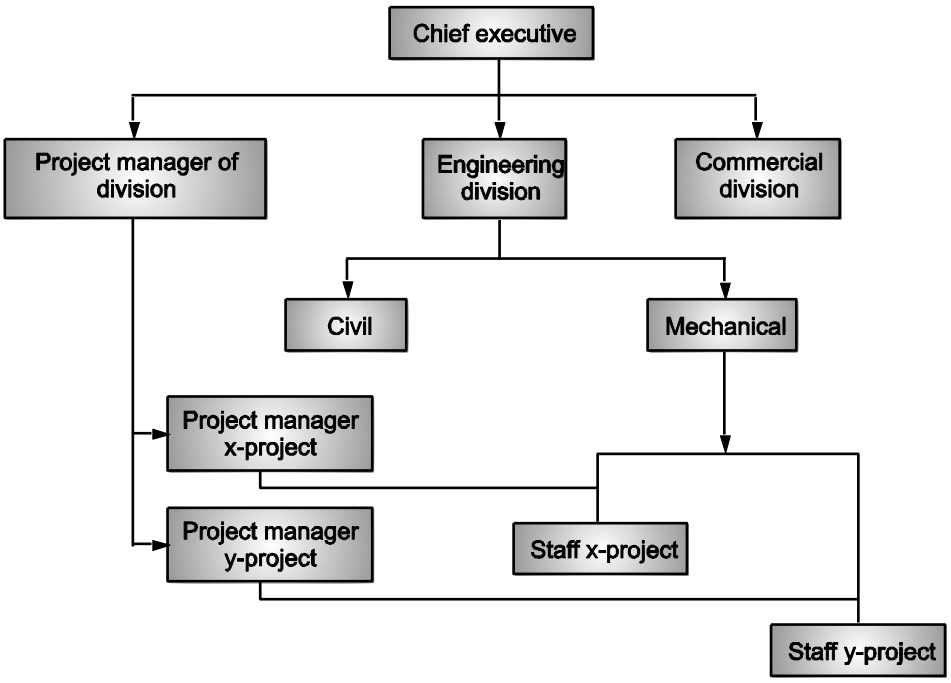

Fig. 1.4

1.5.4 Dedicated Team

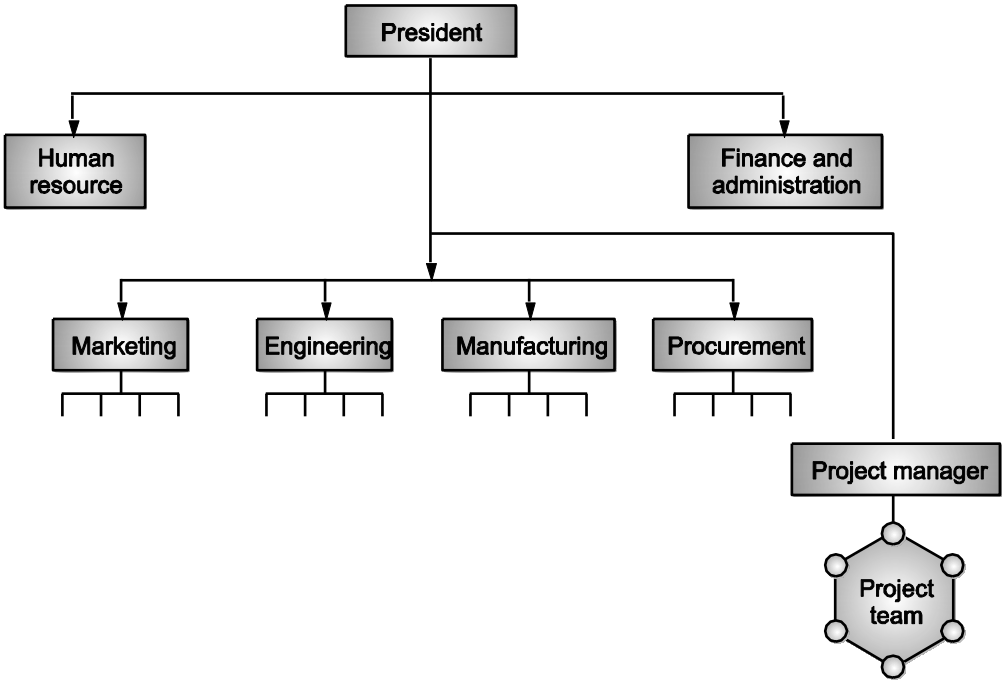

Fig. 1.5

These teams operate as separate units from the rest of the parent organization. The project manager recruits necessary personnel from both within and outside the parent company. The subsequent team is physically separated from the parent organization and given marching orders to complete the project. The project manager is delegated the full authority to make decision for the project, but he is required to operate within the functional policies and procedures of the organization.

1.6 PROJECT IDENTIFICATION

Project identification is concerned with the collection, compilation and analysis of economical data collected from various sources for locating possible opportunities for investment and development of a project.

Industrial project development starts with the identification of the project idea, notion of possibility, desire to produce specific products or services.

Project ideas may arise from one or more of the following :

- Studies of the product consumption pattern of the country.
- Surveys of existing industrial establishments.
- Import schedules and export possibilities.
- Natural resources, geographical surveys, industrial linkages, plan outlays and government guidelines.
- Studies to technology and development literature.
- Increasing demand for manufacturing inputs for different sectors.
- Suggestions from financial institutions and development agencies.

1.7 PROJECT FORMULATION

Project formulation relates to the study of **technical, economical, financial** and **managerial aspects** of all the alternative ways of accomplishing the objectives of the project ideas and to present the findings and supporting data in a systematic and logical order. This is accomplished through a complete technoeconomic feasibility study. The feasibility study is the final document in the formulation of a project proposal.

Feasibility Study : The feasibility study of an industrial project includes :

(a) Market and demand study,

(b) Technical study,

(c) Cost estimates and sources of finance,

(d) Profitability, and

(e) Social cost benefit analysis.

The viability of an industrial project depends on the size of the market and demand for the products or services proposed to be offered by the project.

Technical study is concerned with materials and inputs, project technology, plant capacity, location and site, machinery and equipment.

Feasibility study must provide for realistic cost estimates pertaining to the project and means of financing. The total cost estimates of a project include capital costs, working capital and operating costs.

Profitability analysis includes cost of the project, statement of working cost and break-even analysis.

Social cost benefit analysis is a methodology adopted for evaluating investment projects from the social point of view. It is used primarily for evaluating public sector projects from socio-economic considerations. The contribution of public sector projects towards social objectives such as related to employment and development of health, education, transport and communication facilities and considerations related to defence production, self reliance and foreign exchange savings are evaluated.

1.8 PROJECT PLANNING

Project planning is a vital aspect of project management. Every project involves investment and use of resources. Therefore effective utilization of these resources, proper project planning, monitoring and controlling is necessary.

The project planning involves the following steps :

1. **Formulation** of well defined objectives and policies.
2. **Identification** of activities relating to the project.
3. **Formulation of project organization** which involves definite sections, their managers, authority and responsibility to achieve goals.
4. **Preparation of project schedule** by Bar charts, Network analysis and Line of balance techniques.
5. **Preparation of budget and resources**.
6. **Estimation of time and cost** for completing the activities.

1.9 PROJECT SCHEDULING

Project scheduling establishes a time-frame for the various activities of the project. Scheduling work involves identifying activities to be completed with their sequence. As there are number of activities, different combinations of activity sequences are possible. However,

Project And Business Management

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