

# Accomplishment Of The Essentials Of Managerial Skills For Graduates Through Introduction Of Management Science In The Engineering Curriculum

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*Abstract: Ever since people structured in to groups, management has become a pivotal task to accomplish human activities. As the many tasks could not be achieved as individuals, it has been essential to ensure the coordination of individual efforts and the task of managers has been rising. Everyone who wants to work in organizations would be benefitted from knowledge about managing. They include especially, students in colleges and universities, aspiring managers, those who already have managerial skills and wish to become more effective and other people who want an improved understanding of the organization in which they employed. All the time managers plan, understand the needs of the society, desires of members of the organization, need for material and human resources, technology and other requirements of exterior environment. In general, managers whether they operate in a business, a government organization, a public/private sector, run a foundation or a institution must consider and observe the elements and forces of external environment. They must identify, evaluate, discuss, analyze and react to the forces which may have direct influence on operations of an organization. In this context, in the present scenario of engineering education, inclusion of management science in engineering curriculum leads at the interface among engineering sector, business and public policy. This helps in advancing design, management, operation and interaction of technological, economic and social systems. Further, graduates of the engineering program could be trained as perfect engineers and future leaders in technology, policy, and industry.*

*Keywords: Management; Creativity; Innovation; Motivation; Leadership; Communication.*

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## I. INTRODUCTION

Engineering education occupies an important role in national development. Mainly, engineering education is for the perfection of mankind, comprehension of life, to enlighten of the people. Engineering education is the main instrument for development and change. In this context, it is very important to prepare leaders or managers for different walks of social, intellectual, political, cultural, scientific and technological fields. To accomplish these aspects, graduates are supposed to possess management skills. Management is essential for any organization. Effective management is one of the major concern in private/public and corporate companies. Every graduate in general and engineering graduate in particular would be employed in various positions such as managers, administrators, team leaders, executors, supervisors, trainees etc. Based on situation among a range of levels in an organizations/enterprises. Engineering education is directly concerned with providing leadership in various vocational, industrial, social and economic areas with an objective to determine the policies of modernization. The course on management science emphasizes engineering graduates for developing analytic abilities, making better decisions, developing and executing strategies, and leading people who innovate. The course addresses the methodological as well as the behavioral challenges of operation of organizations and complex systems.

### Management

Management is the process of designing and maintaining an environment in which individuals, working together in groups, efficiently accomplish selected aims. Managers carry out the managerial functions of planning, organizing, staffing, leading and controlling. Management applies to all types of organizations and at all levels. The primary focus of managers should be to create more productivity with effectiveness and efficiency.

The management techniques are basically doing of things, methods of accomplishment of specified task of all kinds of fields. For this, few key managerial techniques have been invented, viz., budgeting, cost accounting, network planning and control techniques

such as Programme Evaluation and Review Technique (PERT) or Critical Path Method (CPM), rate of return on investment control. These techniques generally reflect theory and are useful for managers to perform variety of activities more efficiently.

### **Functions of Managers**

The manager should be capable of creating an environment in which people can carry out group of goals with the minimum amount of time, money, materials and personal dissatisfaction so as to achieve much more possibility of a desired goal with existing resources. Sometimes, managers may not know themselves regarding their productivity unless they first know their goals and those of the organization. The manager must be in a position to say the team is productive. In the recent times, the critical need for productivity enhancement is recognized by government, industries and universities. It is very useful to break down the managerial functions into following five categories.

#### **i. Planning**

Planning is mere selection of mission and objectives of an organization and adopting reasonable action to accomplish them. It requires clarity in decision making with appropriate and alternative action planning. Planning will be executed upon decision, commitment of human or material resources or reputation has been made with respect to analysis and proposal.

#### **ii. Organizing**

Role of the people is one of the important factors to achieve goal of an organization. The awareness about the role that a manager has to perform for a specific task is considered.

#### **iii. Staffing**

Staffing is significant in filling and keeping filled the positions in an organization by identifying work force requirements, availability of expertise and recruitment, selection, placing, promoting, appraising, training to accomplish the requisite tasks efficiently.

#### **iv. Leading**

Leading is influencing the people for achieving organizational goals and group tasks which have interpersonal aspect of managing in connection to their desires and attitudes especially their behavior as individuals and in groups. It is believed that effective managers are also effective leaders. In general, leading comprises of motivation, leadership styles, approaches and communication.

#### **v. Controlling**

Controlling is measuring the performance against the goals and plans of an organization and correcting of activities of deviations of subordinates to ensure the accomplishment of the events and plans.

### **Coordination: The Essence of Managership**

Coordination is one of the most important aspects managerial functions for achieving synchronization and harmony among the individuals of an organization. It is well known that, individuals often express and interpret similar interest in different ways and their efforts towards accomplishment of mutual goals. It has become a pivotal task for a manager to reconcile different approaches, timing, effort or interest and to harmonize individual goals to contribute to organization goals.

### **Managerial Skills and the Organizational Hierarchy**

Organizing is a process of following activities

- Determining, grouping and structuring the activities
- Creating rules for effective performance at work place
- Allotment required authority and responsibility
- Adopting decisive course of actions and methods for various problems, fields, areas such as coordination, communication, motivation etc.

Katz (1974) identified following basic kinds of required skills for administrators.

**Technical skill:** Knowledge of proficiency related to methods, process and procedures. For example, the graduate who joins as supervisor is expected to teach how to use various tools handled by a mechanic.

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**Human Skill:** Ability to work with people, cooperation, teamwork. Team leader must create an environment among the people to feel secure and free to express their opinions.

**Conceptual Skill:** Distinguish significant elements in a situation and to understand the relationships among the elements.

**Design Skill:** Resolve problems in ways that benefit organization. The graduate is supposed to have good design skills in working out a practical solution to a particular problem aroused in an organization.

Graduates are expected to acquaint these skills vary with different levels in the organization to organization. Integrating management science in curriculum reinforces program of engineering and research with following three basic strengths.

- Strengthen conceptual and analytical foundations of graduating student
- Wide-range of exposure of functional areas and their applications in an organization
- Interaction with other organizations and people prior to the joining of an organization in turn beneficial for graduates to know the strategies of working atmosphere

### Discussion

Upon introduction of a course in management science in the engineering curriculum, graduates could lead the following services after their inception in the organization.

- Betterment in quality of lives of people
- Effective cost management, financial planning
- Operational efficiency, market driven studies and financial performance
- Employee morale, motivation and productivity
- Real life issue based research and positive transformation and development

The course brings out factual data on prevailing situations and problems for drawing up new plans, taking up decisions to face challenges, evolving new strategies for upliftment of organization etc. Graduates could able to find out solutions for networking with customers, suppliers and industry/organizations. Mainly, they could able to focus on developing an integrated approach to analyze problems and exploring economical solutions to solve them.

### Conclusion

Management is the method of designing and maintaining an environment for the purpose of accomplishing selected/defined goals of an organization. The necessary functions of a manager is being that planning, staffing, organizing, leading and controlling should be systematically adopted and executed. Managing includes key activities pertaining to all the levels of an organization however the skills vary with organizational levels. Considering quality as a desired parameter, manager is intended to achieve a favorable out-put and in-put ratio within a specific time while considering effectiveness and efficiency. As on today, most of the corporations and organizations are making serious attempts to set up an environment that could be benefitted to individuals, business and society. Further, it also very essential to set the goals in general Management By objectives (MBO) has been widely accepted for performance appraisal and employee motivation. Graduates are able to acquire the analytical and conceptual foundations that include decision and risk analysis, dynamic systems, economics, optimization, organizational science, and stochastic systems. The functional areas of application include entrepreneurship, finance, information, marketing, organizational behavior, policy, production, and strategy. Close associations with other engineering departments and with industry enrich the programs by providing opportunities to apply MS&E methods to important problems and by motivating new theoretical developments from practical experience. MS&E's programs also provide a basis for contributing to other engineering areas such as biotechnology, defense policy, environmental policy, information systems, and telecommunications.

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