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Maintenance Planning and Scheduling

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11.1 Introduction

Planning is the process of determining future decisions and actions necessary to accomplish intended goals, and targets. Planning for future actions helps in achieving goals in the most efficient and effective manner. It minimizes costs and reduces risks and missing opportunities. It can also increase the competitive edge of the organization. The planning process can be divided into three basic levels depending on the planning horizon:

1. Long range planning (covers a period of several years);
2. Medium range planning (one month to one year plans); and
3. Short range planning (daily and weekly plans).

Planning is done at different decision levels, strategic or tactic. It can be done at different organizational levels, corporate, business, functional or operational. Decision at the strategic level are concerned with issues related to the nature of existence of the business as a corporate whereas tactical decisions effect the way business conducted at a certain stage of its growth line. Strategic planning sets the long term vision of the organization and draws the strategic path for achieving that intended vision. Long term and short term planning at the tactical level is concerned on selecting ways within a preset strategy for achieving long, medium and short term goals and targets. Strategic planning is by definition a long term plan and can be done at the functional, business or corporate level. Long term planning, however, is not necessary strategic. In general, regardless of the type and purpose of planning, it includes the determination of the actions or tasks as well as the resources needed for their implementation.

Scheduling is the process of putting the tasks determined by the plan into a time frame. It takes into consideration the intended goals, the interrelations between the different planned tasks, the availability of resources overtime and any other internal and external limitations and constraints. The quality of the resulting schedule is usually measured by a performance measure in relation to the intended
goal of the task or tasks. Performance measures can be related to different types of costs through meeting due dates, time of completion, or utilization of resources.

Maintenance in its narrow meaning includes all activities related to maintaining a certain level of availability and reliability of the system and its components and its ability to perform at a standard level of quality. It includes activities related to maintaining spare part inventory, human resources and risk management. In a broader sense, it includes all decisions at all levels of the organization related to acquiring and maintaining high level of availability and reliability of its assets. Maintenance is becoming a critical functional area in most types of organizations and systems such as construction, manufacturing, transportation, etc. It is becoming a major functional area that effects and affected by many other functional areas in all types of organizations such as production, quality, inventory, marketing and human resources. It is also getting to be considered as an essential part of the business supply chain at a global level. This increasing rule of maintenance is reflected in its high cost which is estimated to be around 30% of the total running cost of modern manufacturing and construction businesses. A system view of a maintenance system is introduce by Visser (1998) that puts maintenance in perspective with respect to the enterprise system as shown in Figure 11.1.

Corporate business planning, long or short term, strategic or tactic should take maintenance into consideration for all types of decisions that involve future major investments. A decision on acquiring a new facility, for example, might turn into a complete disaster for the whole business for its low maintainability. Capacity planning of the plant should consider its maintainability and the capacity of maintaining it.

Planning and scheduling are the most important aspects of sound maintenance management. Effective planning and scheduling contributes significantly to reducing maintenance costs, reducing delays and interruptions and improving

![Figure 11.1. Input output model of the enterprise](image-url)