CHAPTER 1

INTRODUCTION

1.1 Background of Study

Planning can be thought of as determining "what" is going to be done, "how","when" by "whom", and "when." In construction projects the "plans" (blueprints) and specifications for the project generally define both the end product and, often, the general time frame in which to complete the project. However, they normally do not specifically identify the individual steps, their order, and the timing followed to achieve the end product. Thus, when we discuss planning in the construction process, we must address the "how" and, therefore, the "what," "when," "where," and "who."

When we discuss scheduling, we are usually interested in some aspect of the time element of the plan. A schedule is a timetable of activities, such as of "what" will be done or "who" will be working. Such a timetable can be looked at in two ways: the first is focusing on an activity, such as determining "when" a certain task will be performed relative to other activities. The second is concentrating on a
specified time frame and then ascertaining "who" will be working (or needed) or "what" should be occurring at a particular time. All of us are involved in planning and scheduling on an ongoing basis. The degree to which we carry it out and the techniques we use vary depending upon the complexity of our, situations and our needs and objectives.

Planning and scheduling are basic to most things we, as humans, do. Planning is the way organizes and sequence the tasks needed to accomplish a goal. There are plans for meeting common goals, such as getting to work on time, and more formal plans, such as those used by companies (such as a strategic plan, business plan, financial plan, and marketing plan). The planning required to construct an office building requires the identification of the tasks needed to complete the building and then the sequencing of those tasks in their logical order. Scheduling is one component of the plan and aids in visualizing the plan.

The scheduling part of the construction plan requires that the tasks or activities are assigned a duration corresponding to the anticipated productivity of the crews doing the work. When tasks have durations and are put in their proper order by identifying the relationships they have with one another, a construction schedule is created. Scheduling is just one part of construction planning, which may also include plans for safety, community relations, material storage and handling, and environmental protection along with the schedule to create the overall construction plan.

The construction schedule has many uses, beginning with its representation of the initial construction plan. To be effective, plans must be monitored for progress. A comparison of the progressed, or update, schedule with the project baseline, or original, plan enables the manager to identify problems early. Adjustments can be made when needed, and the effect of proposed changes can be simulated in the schedule, so that the result can be assessed.

In 1917 Henry Gantt developed a method of relating a list of activities to a time scale in a very effective manner, by drawing a bar (or Gantt). Henry Gantt (1861-1919) was a pioneer of management science who is almost as well known in
management sciences circles for his views on productivity and employee compensation as for the bar chart. He developed a means of depicting industrial tasks in a way that easily communicated the tasks, their durations, and their timing to each project participant.

Two companies, DuPont and Remington Rand, collaboratively developed the Critical Path Method (CPM) in the 1950s for the renovation, construction, and maintenance of chemical plants. "DuPont's goal was to optimize and balance the lost opportunity costs of a refinery's downtime with the increased costs of accelerating the renovation."

This critical path method evolved into what is known as the Arrow Diagramming Method (ADM) or Activity On Arrow (AOA) method. The ADM removed the statistical component from the PERT critical path method and replaced it with a deterministic method for assigning activity durations. Later, the precedence diagramming method (PDM) evolved replacing the single finish start-to-start relationship found in the ADM with multiple types of relationships. Each advance has given the planner and scheduler better tools for modelling reality.

John Fondahi, emeritus faculty at Stanford University and winner of the American of Civil Engineer's (ASCE) Peurifoy Construction Research Award in 1990, has been noted as the originator of the modern, deterministic CPM scheduling method. His work has helped constructors effectively model their projects in more flexible and less cumbersome ways than were previously available.

A manager schedules to achieve control of not only time, but also cost, quality, and safety. The schedule helps managers plan methods and procedures that will ensure that the project objectives are met. The management team schedules in order to accomplish activities in the most productive manner possible so that time is not wasted on the project. Then, the schedule becomes the primary tool to communicate that thinking and planning by the management team to all the shareholders in the project. In specifically, according to (J.S Newit, 2005) these are benefits of scheduling: