LECTURE # 1

1. Introduction & Fundamentals

1.1 What is Management?

Basically, the management involves the following activities:

- **Planning**- deciding what is to be done
- **Organizing**- making arrangements
- **Staffing**- selecting the right people for the job
- **Directing**- giving instructions
- **Monitoring**- checking on progress
- **Controlling**- taking action to remedy hold-ups
- **Innovating**- coming up with new solutions
- **Representing**- liaising with users, etc.

1.2 What is Project Management?

Project Management is the art of maximizing the probability that a project delivers its goals on **Time**, to **Budget** and at the required **Quality**.

The art of planning for the future has always been a human trait. In essence a project can be captured on paper with a few simple elements: a start date, an end date, the tasks that have to be carried out and when they should be finished, and some idea of the resources (people, machines etc) that will be needed during the course of the project.

Project management is the **application of knowledge, skills, tools, and techniques** to project activities to meet project requirements. Project management is accomplished through the use of the processes such as: initiating, planning, executing, controlling, and closing. It is important to note that many of the processes within project management are iterative in nature. This is in part due to the existence of and the necessity for progressive elaboration in a project throughout the project life cycle; i.e., the more you know about your project, the better you are able to manage it.

Project management is also defined as a **strategic competency** that has successfully been applied in such high profile projects as the construction of silk root, organizing and managing the Olympics Games, and the construction of Islamabad-Lahore motorway, just to name a few. If project management can play a major role in these success stories, just imagine what it might be able to do for your own organization.

The term project management is sometimes used to describe an organizational approach to the management of ongoing operations. This approach, more properly

called **management by projects**, treats many aspects of ongoing operations as projects to apply project management techniques to them.

Almost any human activity that involves carrying out a non- repetitive task can be a project. So we are all project managers! We all practice project management (PM). But there is a big difference between carrying out a very simple project involving one or two people and one involving a complex mix of people, organizations and tasks.

1.3 What is Software Project Management?

When the plan starts to involve different things happening at different times, some of which are dependent on each other, plus resources required at different times and in different quantities and perhaps working at different rates, the paper plan could start to cover a vast area and be unreadable.

Nevertheless, the idea that complex plans could be analyzed by a computer to allow someone to control a project is the basis of much of the development in technology that now allows projects of any size and complexity, not only to be planned, but also modeled to answer 'what if?' questions.

The original programs and computers tended to produce answers long after an event had taken place. Now, there are many project planning and scheduling programs that can provide real time information, as well as linking to risk analysis, time recording, and costing, estimating and other aspects of project control.

But **computer programs are not project management: they are tools for project managers to use**. Project management is all that mix of components of control, leadership, teamwork, resource management etc that goes into a successful project.

Project managers can be found in all industries. Their numbers have grown rapidly as industry and commerce has realized that much of what it does is project work. And as project-based organizations have started to emerge, project management is becoming established as both a professional career path and a way of controlling business.

So opportunities in project management now exist not only in being a project manager, but also as part of the support team in a project or program office or as a team leader for part of a project. There are also qualifications that can be attained through the professional associations.

1.4 What is a Project?

A project is **an activity with specific goals which takes place over a finite period** of time.

"A temporary organization that is needed to produce a unique and pre-defined outcome or result at a pre-specified time using pre-determined resources"

Projects are often implemented as a means of achieving an organization's strategic plan. Operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique. A project can thus be defined in terms of its distinctive characteristics—***a project is a temporary endeavor undertaken to create a unique product or service. Temporary*** means that every project has a definite beginning and a definite end. ***Unique*** means that the product or service is different in some distinguishing way from all other products or services. For many organizations, projects are a means to respond to those requests that cannot be addressed within the organization's normal operational limits.

Projects are undertaken at all levels of the organization. They may involve a single person or many thousands. Their duration ranges from a few weeks to more than five years. Projects may involve a single unit of one organization or may cross organizational boundaries, as in joint ventures and partnering.

Examples of projects include:

- Developing a new product or service.
- Effecting a change in structure, staffing, or style of an organization.
- Designing a new transportation vehicle.
- Developing or acquiring a new or modified information system.
- Constructing a building or facility.
- Building a water system for a community in a developing country.
- Running a campaign for political office.
- Implementing a new business procedure or process.

1. Temporary

Temporary means that every project has a definite beginning and a definite end. The end is reached when the project's objectives have been achieved, or it becomes clear that the project objectives will not or cannot be met, or the need for the project no longer exists and the project is terminated. Temporary does not necessarily mean short in duration; many projects last for several years. In every case, however, the duration of a project is finite; projects are not ongoing efforts.

2. Unique, Product Service or Result

Projects involve creating something that has not been done in exactly the same way before and which is, therefore, *unique* and distinct. Projects create:

- A product or artifact that is produced, is quantifiable and can be either an end item in itself or a component item
- A capability to perform a service, such as business functions supporting production or distribution
- A result, such as new knowledge. For example, a research and development project develops knowledge that can be used to determine whether or not a trend is present or a new process will benefit society.

The presence of repetitive elements does not change the fundamental uniqueness of the project work. For example:

- A project to develop a new commercial airliner may require multiple proto-types.
- A project to bring a new drug to market may require thousands of doses of the drug to support clinical trials.
- A real estate development project may include hundreds of individual units.
- A development project (e.g., water and sanitation) may be implemented in five geographic areas.

3. Aims/Tasks/Purpose

The projects are designed to achieve specific targets defined in terms of aims, tasks or a purpose. The nature and size of the project depends upon complexity of the task, realization of the aims and scope of the purpose any organization wants to achieve. In short project has to be aimed for achieving certain tasks in a given time frame.

4. Limited Time Scale

The projects are always designed considering time constraints. Extension to the project completion dead lines are always discouraged as time overrun, costs extra and in some cases opportunity cost for not completing a project is too high.

🗁 **Progressive, Elaboration**

Progressive elaboration is a characteristic of projects that accompanies the concepts of temporary and unique. "***Progressively***" means developing thoroughly in steps, and continuing steadily by increments while ***elaborated*** means "worked out with care and detail; developed thoroughly"

For example, the project scope will be broadly described early in the project, and made more explicit and detailed as the project team develops a better and more complete understanding of the objectives and deliverables.

Progressive elaboration of project specifications must be carefully coordinated with proper project scope definition, particularly if the project is performed under contract. When properly defined, the scope of the project—the work to be done—should be controlled as the project and product specifications are progressively elaborated.

The following examples illustrate progressive elaboration in two different application areas.

- ✓ *Example 1.* Development of a chemical processing plant begins with process engineering to define the characteristics of the process. These characteristics are used to design the major processing units. This information becomes the basis for engineering design, which defines both the detail plant layout and the mechanical characteristics of the process units and ancillary facilities. All of this results in design drawings that are elaborated to produce fabrication and construction drawings. During construction, interpretations and adaptations are made as needed and subject to proper approval. This further elaboration of the deliverables is captured in as-built drawings, and final operating adjustments are made during testing and turnover.

- ✓ *Example 2.* The product of an economic development project may initially be defined as: "Improve the quality of life of the lowest income residents of community X." As the project proceeds, the products may be described more specifically as, for example: "Provide access to food and water to 500 low income residents in community X." The next round of progressive elaboration might focus exclusively on increasing agriculture production and marketing, with provision of water deemed to be a secondary priority to be initiated once the agricultural component is well under way.