Professional Practices
HU-511(BSCS), HU-601(BSIT)

Dr. Arbab Waseem Abbas
ICS/IT, FMCS, The University of Agriculture, Peshawar.

Lecture 3(week 7 & 8)

Lecture # 3

Project Management

What is Project Management?

Project : A group of milestones or phases, activities or tasks that support an effort to accomplish something

Management : is the process of Planning, Organizing, Controlling and Measuring

Project...

- **A collection of linked activities, carried out in an organized manner, with a clearly defined START POINT and END POINT to achieve some specific results desired to satisfy the needs of the organization at the current time**

Project Management

- **A dynamic process that utilizes the appropriate resources of the organization in a controlled and structured manner, to achieve some clearly defined objectives identified as needs.**
- **It is always conducted within a defined set of constraints**
- **Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project**

Project Stakeholders

- Stakeholders are the people involved in or affected by project activities
- Stakeholders include
  - the project sponsor and project team
  - support staff
  - customers
  - users
  - suppliers
  - opponents to the project

Project Management Statistics

- The U.S. spends $2.3 trillion on projects every year, an amount equal to one-quarter of the nation's gross domestic product (GDP).
- The world as a whole spends nearly $10 trillion of its $40.7 trillion gross product on projects of all kinds.
- More than sixteen million people regard project management as their profession; on average, a project manager earns more than $82,000 per year.*

*PMI, The PMI Project Management Fact Book, Second Edition, 2001
PMI (Project Management Institute)

Advantages of Using Formal Project Management

- ❑ Better control of financial, physical, and human resources
- ❑ Improved customer relations
- ❑ Shorter development times
- ❑ Lower costs
- ❑ Higher quality and increased reliability
- ❑ Higher profit margins
- ❑ Improved productivity
- ❑ Better internal coordination
- ❑ Higher worker morale

What Is a Project?

- A project is “a temporary endeavor undertaken to accomplish a unique product or service”
- (PMBOK® Guide 2000, p. 4)
- Attributes of projects
  - unique purpose
  - temporary
  - require resources, often from various areas
  - should have a primary sponsor and/or customer
  - involve uncertainty

Samples of IT Projects

- Northwest Airlines developed a new reservation system called ResNet (see case study on companion Web site at www.course.com/mis/schwalbe)
- Many organizations upgrade hardware, software, and networks via projects
- Organizations develop new software or enhance existing systems to perform many business functions
- Note: "IT projects" refers to projects involving hardware, software, and networks

The Triple Constraint

- Every project is constrained in different ways by its
  - Scope goals: What is the project trying to accomplish?
  - Time goals: How long should it take to complete?
  - Cost goals: What should it cost?
- It is the project manager's duty to balance these three often competing goals

Figure 1-1. The Triple Constraint of Project Management

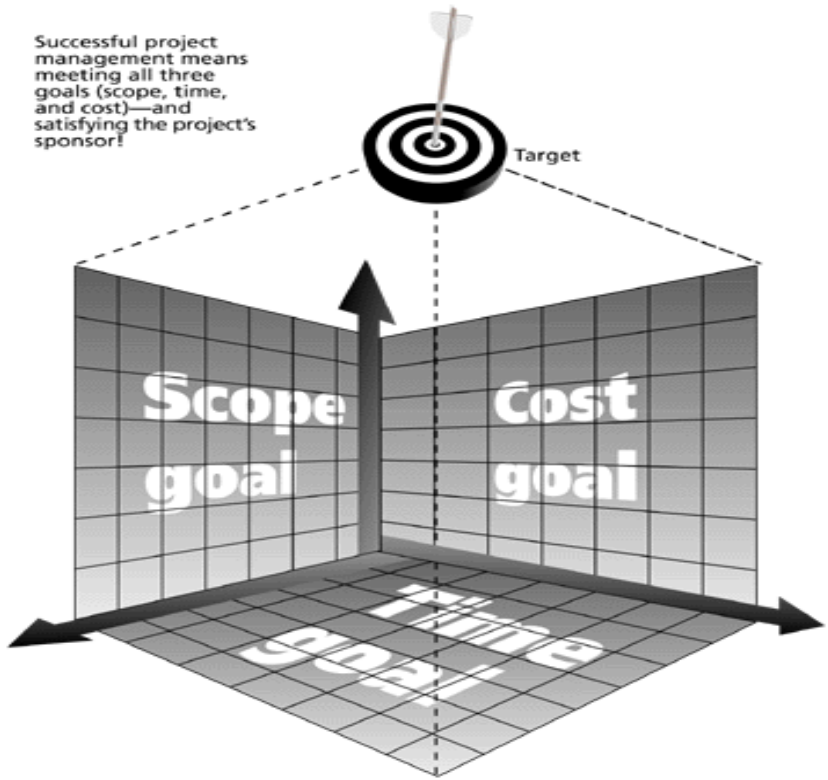

Figure 1-2. Project Management Framework

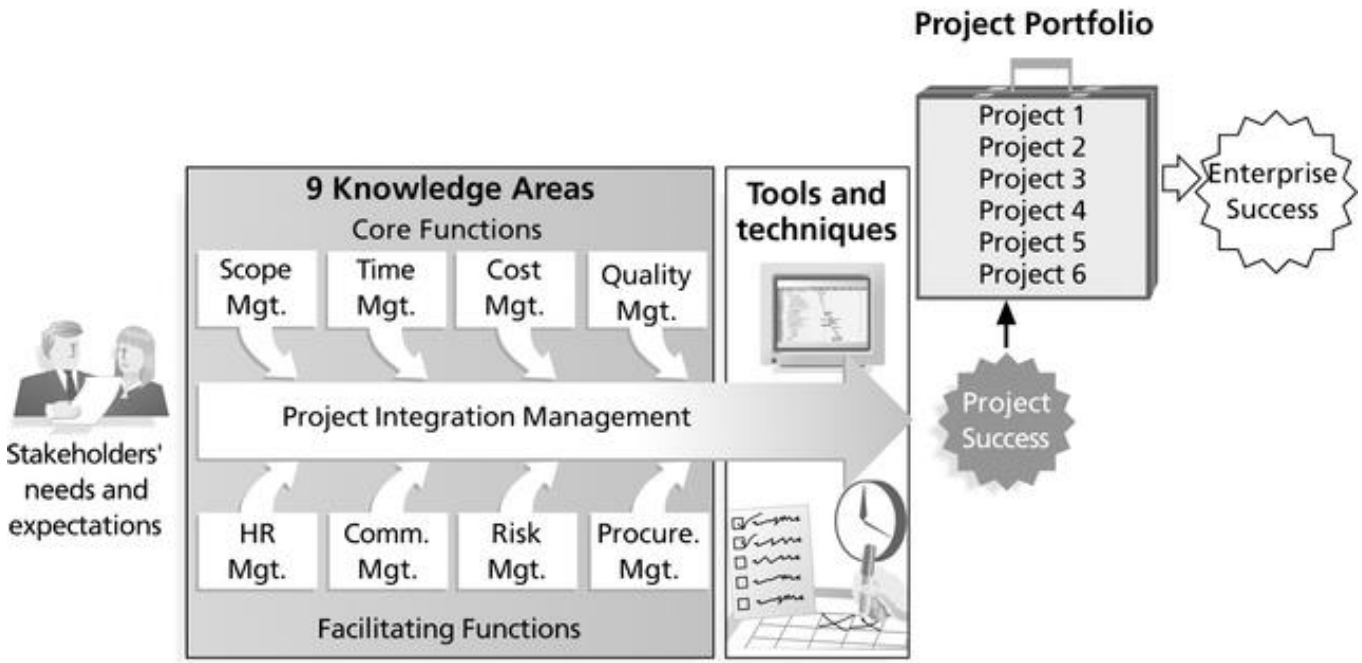

Figure 1-2. Project Management Framework

9 Project Management Knowledge Areas

- Knowledge areas describe the key competencies that project managers must develop
  - 4 core knowledge areas lead to specific project objectives (scope, time, cost, and quality)
  - 4 facilitating knowledge areas are the means through which the project objectives are achieved (human resources, communication, risk, and procurement management)
  - 1 knowledge area (project integration management) affects and is affected by all of the other knowledge areas

Project Integration Management

- **Describes the processes required to ensure that the various elements of the project are properly coordinated.**
  - **Tradeoffs among competing objectives and alternatives to meet or exceed stake holders needs or expectations**

Project Scope Management

- **Describes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.**

Project Time Management

- **Describes the processes required to ensure timely completion of the project.**

Project Cost Management

- **Describes the processes required to ensure that the project is completed within the approved budget.**

Project Quality Management

- **Describes the processes required to ensure that the project will satisfy the needs for which it was undertaken.**

Project Human Resource Management

- **Describes the processes required to make the most effective use of the people involved with the project**
- **Consists of**
  - **• organizational planning**
    - **Identifying, documenting and assigning project roles and responsibilities**
  - **• staff acquisition**
    - **Getting the human resource needed, assigned to and working on the project**
  - **• team development.**
    - Developing individual and group competencies to enhance project performance

Project Communications Management

- **Describes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information**

Project Risk Management

- **Describes the processes concerned with identifying, analyzing, and responding to project risk**
- **An effective software measurement process can provide early warning of problems associated with risks**
  - **• indicators can be used to project any trends**
  - **• early warning can allow action in time to prevent problems**

Project Procurement Management

- **Describes the processes required to acquire goods and services from outside the performing organization**
- **Consists of**
  - **• procurement planning**
  - **• solicitation planning**
  - **• source selection**
  - **• contract administration**
  - **• contract close-out**

Project Management Tools and Techniques

- Project management tools and techniques assist project managers and their teams in various aspects of project management
- Some specific ones include
  - Project Charter, scope statement, and WBS (work breakdown structure) (scope)
  - Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
  - Cost estimates and earned value management (cost)

History of Project Management

- Some people argue that building the Egyptian pyramids was a project, as was building the Great Wall of China
- Most people consider the Manhattan Project to be the first project to use “modern” project management
- This three-year, $2 billion (in 1946 dollars) project had a separate project manager and a technical manager

Sample Gantt Chart

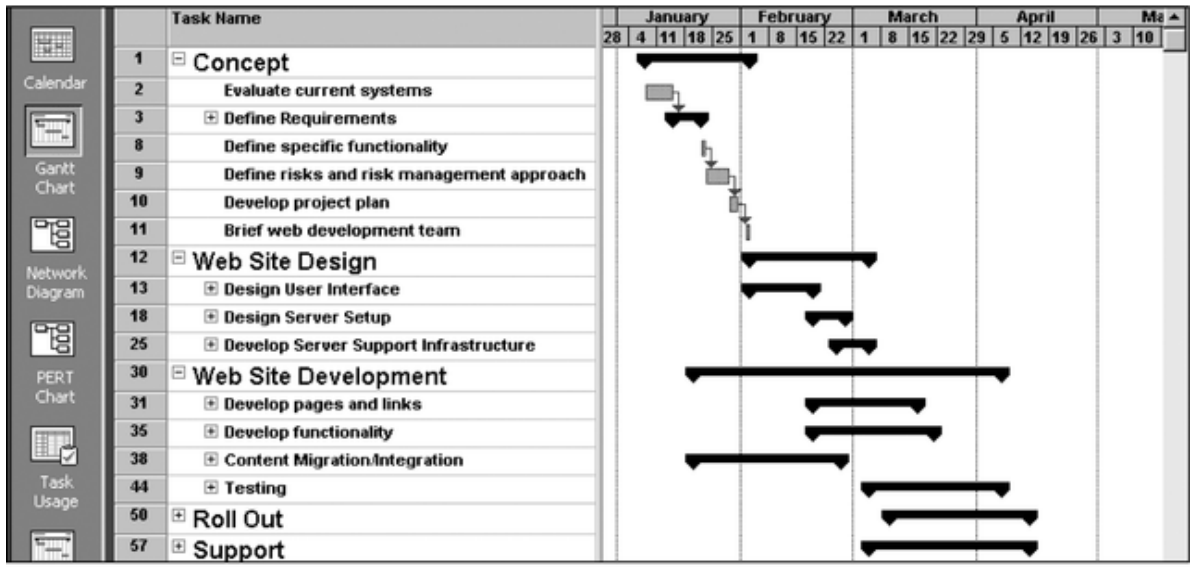

Figure 1-3. Sample Gantt Chart in Microsoft Project 2002

The WBS is on the left, and each task's start and finish date are shown on the right using a calendar timescale. Early Gantt Charts, first used in 1917, were drawn by hand.

Sample Network Diagram

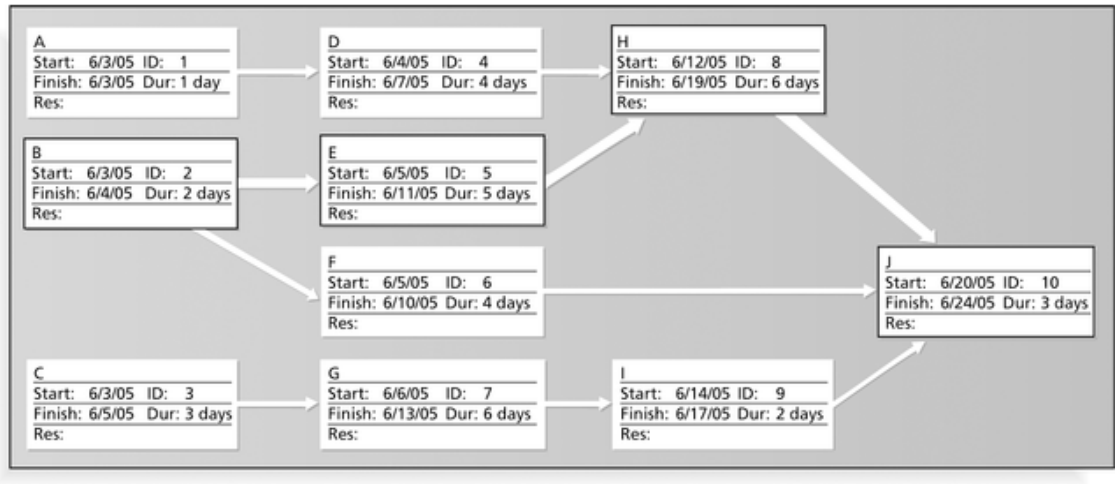

Figure 1-4. Sample Network Diagram in Microsoft Project 2002

Each box is a project task from the WBS. Arrows show dependencies between tasks. The bolded tasks are on the critical path. If any tasks on the critical path take longer than planned, the whole project will slip unless something is done. Network diagrams were first used in 1958 on the Navy Polaris project, before project management software was available.

Sample Enterprise Project Management Tool

Company ABC Project Portfolio				
Project Name	**Scope**	**Schedule**	**Budget**	**Links**
Active Projects				
Project 1	○	◔	◔	
Project 2	●	●	◔	
Project 3	○	○	○	
Project 4	○	◔	●	
Approved Projects				
Project 10	○	○	○	
Project 11	○	○	○	
Project 12	○	○	○	
Project 13	○	○	○	
Project 14	○	○	○	
Opportunities				
Project 100				
Project 200				
○	White = going well			
◔	Gray = some problems			
●	Black = major problems			

Figure 1-5. Sample Enterprise Project Management Tool

In recent years, organizations have been taking advantage of software to help manage their projects throughout the enterprise.

Project Phases and the Project Life Cycle

- A project life cycle is a collection of project phases
- Project phases vary by project or industry, but some general phases include
  - concept
  - development
  - implementation
  - support

Phases of the Project Life Cycle

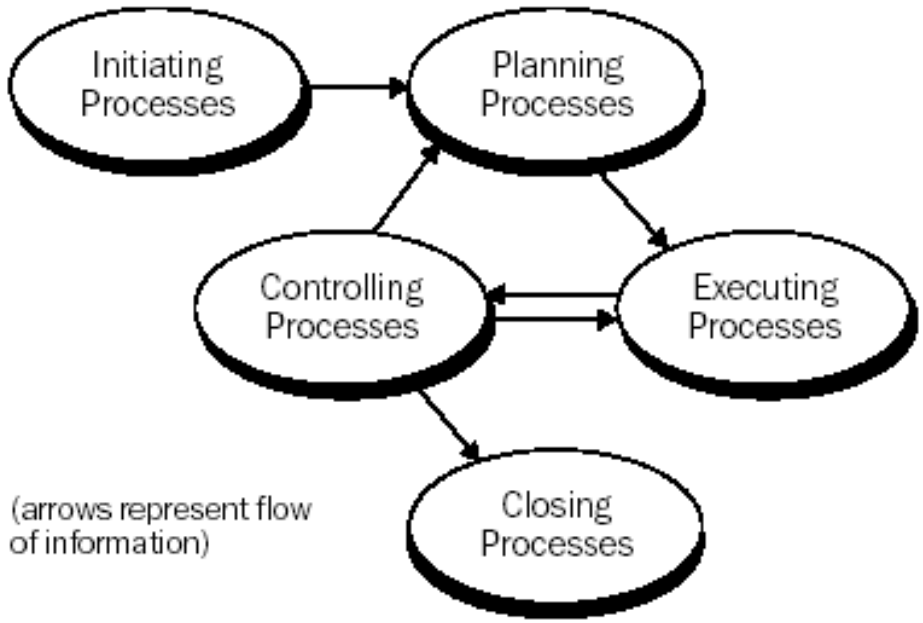

Figure 3-1. Links among Process Groups in a Phase

Product Life Cycles

- Products also have life cycles
- The Systems Development Life Cycle (SDLC) is a framework for describing the phases involved in developing and maintaining information systems
- Systems development projects can follow
  - predictive models: the scope of the project can be clearly articulated and the schedule and cost can be predicted
  - adaptive models: projects are mission driven and component based, using time-based cycles to meet target dates

Predictive Life Cycle Models

- The ***waterfall model*** has well-defined, linear stages of systems development and support
- The ***spiral model*** shows that software is developed using an iterative or spiral approach rather than a linear approach. The spiral model is a systems development lifecycle (SDLC) method used for risk management that combines the iterative development process model with elements of the Waterfall model. The spiral model is used by software engineers and is favored for large, expensive and complicated projects.
- The ***incremental release model*** provides for progressive development of operational software
- The ***prototyping model*** is used for developing prototypes to clarify user requirements
- The ***RAD model*** is used to produce systems quickly without sacrificing quality. Rapid Application Development or RAD means an adaptive software development model based on prototyping and quick feedback with less emphasis on specific planning