Introduction to the Project Management

Project Management
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Learning Outcomes

At the completion of this lesson, student will be able to;

- Explain the history of project management
- Identify the forces fostering the PM
- Define the terms project, project management and its attributes
- Identify the key constraints within which a project must be managed
- Discuss how a project is "born"
- Describe the life of a project
- Explain the steps involved in the project management process
- Explain the benefits of project management

Introduction

- Rapid growth in project management
- Main forces in driving the acceptance of project management:
  - Exponential growth of human knowledge
  - Growing demand for a broad range of complex goods and services
  - Increased worldwide competition
- All of these contribute to the need for organizations to do more and to do it faster

Introduction

- In the past, most projects were external
  - Building a new skyscraper
  - New ad campaign
  - Launching a rocket
- Growth lately is in internal projects
  - Developing a new product
  - Opening a new branch
  - Improving the services provided

What is a Project?

"Unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost, quality and resources"

- A Project is a planned set of activities
- A Project has a scope
- A Project has time, cost, quality and resource constraints

- A project is a temporary endeavor to accomplish a specific objective through a unique set of interrelated tasks and the effective utilization of resources.

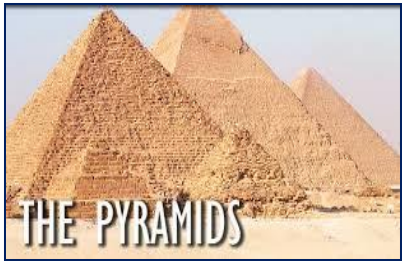
How Project Management Developed?

2570 BC

208 BC

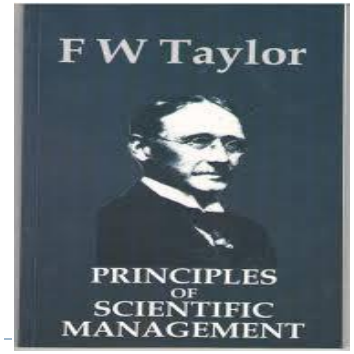
How Project Management Developed?

- Way back in BC 2500… Pyramids of Egyptians… (were organized as projects, but without any management philosophy.



- 208 BC: Construction of the Great Wall of China. construction of the Great Wall had been a large project.

- 1911 Taylorism/Scientific Management: Henry L Gantt invents the Gantt scheme



How Project Management Developed?

- 1931: Karol Adamiecki creates the first network diagram, the so called Harmonogram

- 1942-45: The Manhattan project (USA). The project began modestly in 1939, but grew to employ more than 130,000 people and cost nearly US$2 billion

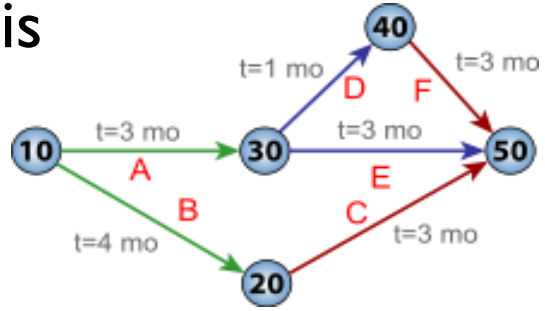
How Project Management Developed?

- 1950ies: Operations analysis, RAND Corporation
- 1957: The Sputnik shock, initiating the Polaris project

- The Polaris project: The Polaris missile was nuclear-armed submarine-launched ballistic missile (SLBM) built during the Cold War by Lockheed Corporation of California for the United States Navy.
- Many new project management techniques were introduced during the development of the Polaris missile program, to deal with the inherent system complexity. This includes the use of the Program Evaluation and Review Technique (PERT). This technique replaced the simpler Gantt chart methodology which was largely employed prior to this program.

How Project Management Developed?

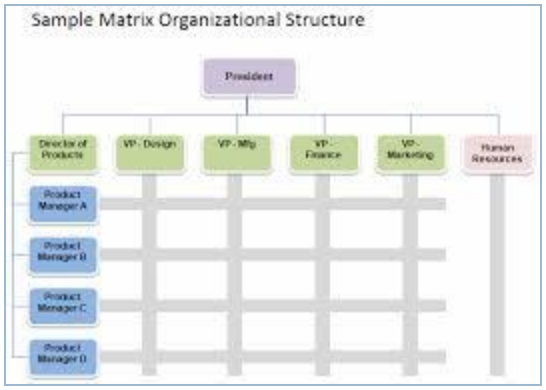
- 1956-59: CPM (Critical Path Method) is created at DuPont, independent of PERT.



- 1959: The concept of ”project manager” is coined in Harvard Business Review.

How Project Management Developed?

- 1960ies: Great interest in matrix organizations



- 1967: INTERNET and PMI is established

Project Management Institute®

How Project Management Developed?

- 1980ies: Increasing interest in organizational and project management issues in projects. The project philosophy spreads to other fields, to smaller activities and to internal activities.

- 1987: PMBOK (Project Management Body of Knowledge) presents its first ever certified project management concept by PMI in the form of so called PMPs (Project Management Professionals).

How Project Management Developed?

- 1990ies: Management by projects (the project based company), Agile project Management.

- 2000s: Portfolio management techniques.

How Project Management Developed?

- Credit for the development of modern project management goes to the military
  - Navy's Polaris program
  - NASA's Apollo space program
  - Development of "smart bombs" and "missiles"

- Project management has found wide acceptance in industry
- It has many applications outside of construction
- E.g.
  - Managing legal cases
  - Managing new product releases

Examples of Projects

- Developing and introducing new product
- Planning a wedding
- Designing and implementing a computer system
- Modernizing a factory
- Consolidating two manufacturing plants
- Hosting a holiday party
- Designing and producing a brochure
- Executing an environmental clean-up of a contaminated site
- Designing internship program for high school students
- Performing a series of surgeries on an accident victim
- Building a shopping mall

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What is a Project?

- A temporary endeavor undertaken to create a unique product, service, or result (PMI,2001)

- Modern project management began with the Manhattan Project(1942-1946)
- In its early days, project management was used mainly for large complex projects
- As the tools and techniques were developed, the use of project organization began to spread

What is Project Management?

- The art of organising, leading, reporting and completing a project through people

What is Project Management?

- A project is a planned undertaking
- A project manager is a person who causes things to happen
- Therefore, project management is causing a planned undertaking to happen.

Attributes of a Project

- Has a well-defined objective- scope, schedule and cost
- Composed of a series of interdependent tasks
- Utilizes various resources
- Has a specific time frame
- Has a sponsor/customer
- Involves a degree of uncertainty

Factors constraining project success

Factors constraining project success

- **Scope/performance:** is all the work that must be done in order to produce all the project deliverables, satisfy customers and accomplish project objectives

- **Quality:** The project work scope must be accomplished in a quality manner and meet specifications

- **Schedule:** is the timetable that specifies when each task or activity should start and finish

Factors constraining project success

- **Budget:** is the amount the sponsor or customer has agreed to pay for acceptable project deliverables
- **Resources:** Various resources are needed to perform the project tasks and accomplish the project objective. Resources include people, materials, equipment, facilities, and so on
- **Risk:** Factors that adversely affect in accomplishing the project objective
- **Customer Satisfaction:** means not only meeting the customer's expectations but also developing and maintaining an excellent working relationship throughout the project

- Successfully completing the project requires finishing the **scope** of work within **budget** and a certain **time frame**, while managing **resource** utilization, meeting **quality** specifications, and managing **risks**—and this must all be done while assuring **customer or sponsor satisfaction**.

Unforeseen Circumstances

- Unforeseen circumstances may jeopardize achievement of the project objective.
  - The cost of some of the materials may be higher than originally estimated
  - Inclement weather may cause a delay
  - Additional redesign and modification of product
  - Delivery of a critical component for an aviation control system is delayed several months.
  - A key project team member with unique technical knowledge decides to retire, which creates a gap in critical expertise
- The challenge facing the project manager is to prevent, anticipate, and/or overcome such circumstances.
- Good planning and communication are essential to prevent problems from occurring or to minimize their impact on the achievement of the project objective when do they occur

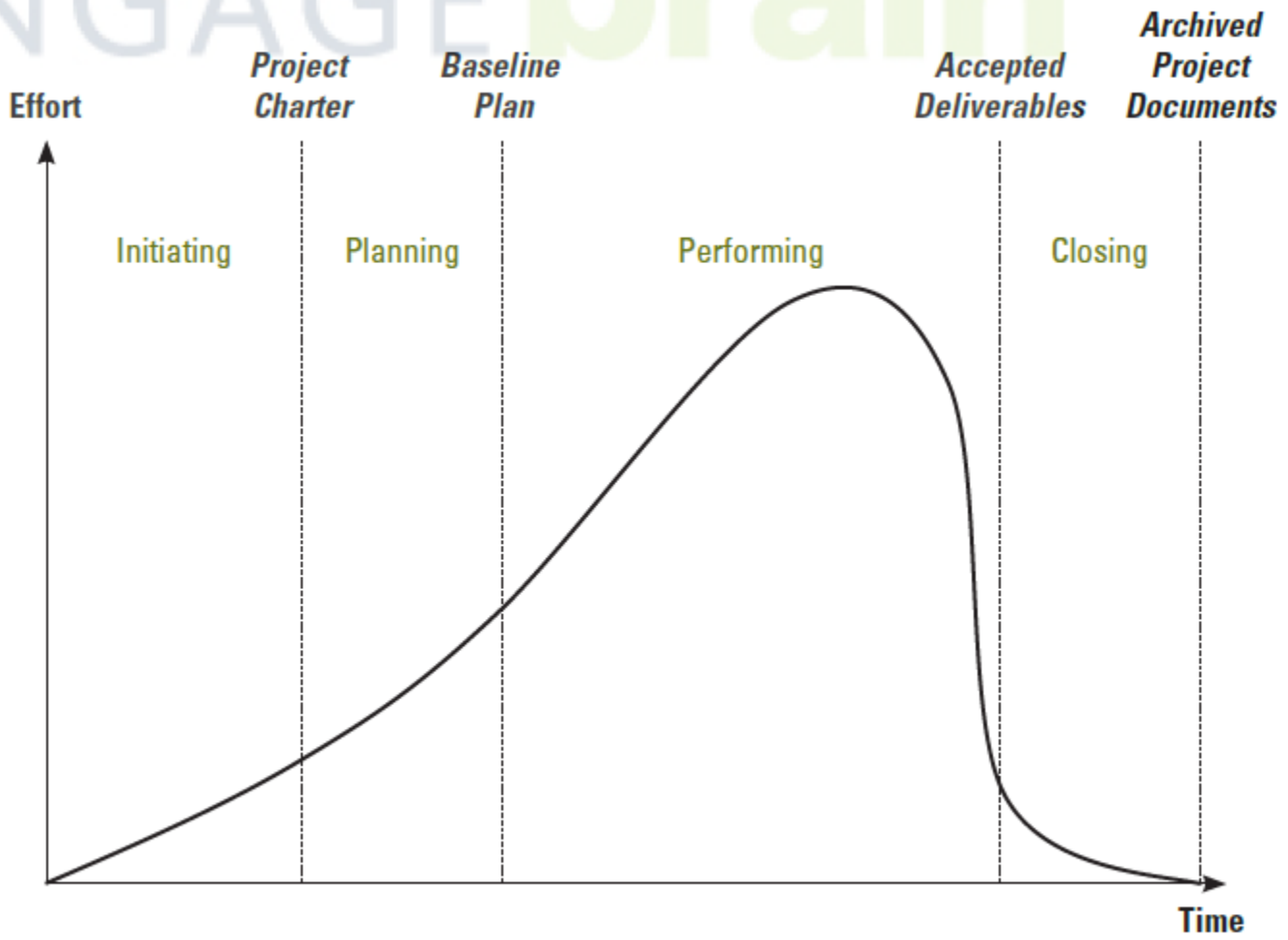
Project Manager

- Project manager is the key individual on a project
- Project manager is like a mini-CEO

The Project Life Cycle

- Projects are “born” when a need is identified by the customer.
- Project life cycles vary in length, from a few weeks to several years.
- Not all projects formally go through all four phases of the project life cycle.

The Project Life Cycle



Initiating

- The first phase involves the identification of a need, problem, or opportunity.
  - The need and requirements are usually written by the customer into a document called a request for proposal (RFP).
  - Project charter: The charter may include the rationale or justification for the project; project objective and expected benefits; general requirements and conditions such as amount of funds authorized, required completion date, major deliverables, and required reviews and approvals; and key assumptions.

Planning

- The second phase is the development of a proposed solution to the need or problem.
  - This phase results in the submission of a proposal.
  - The customer and the winning contractor negotiate and sign a contract (agreement).
- The planning involves determining what needs to be done (scope, deliverables), how it will get done (activities, sequence), who will do it (resources, responsibility), how long it will take (durations, schedule), how much it will cost (budget), and what the risks are.
- The result of this effort is baseline plan that is a roadmap for accomplishing the project within the requirements and constraints in the project charter or contract.

Phases of the Project Life Cycle 3

- The third phase is performing the project.
  - Different types of resources are utilized
  - Results in the accomplishment of the project objective
  - It is necessary to monitor and control the progress of the project work to ensure that everything is going according to plan and the project objective will be accomplished
  - Changes are going to occur during the performing phase. So it is important to manage and control changes to minimize any negative impact on the successful accomplishment of the project objective.

Phases of the Project Life Cycle 4

- The final phase is terminating the project.
  - The process of closing the project involves various actions, including collecting and making final payments, evaluating and recognizing staff, conducting a post-project evaluation, documenting lessons learned, and archiving project documents
  - Evaluate performance
  - Invite customer feedback

The Project Management Process

- The project management process means planning the work and then working the plan.

- The planning process determines what needs to be done (scope, deliverables), how it will get done (activities, sequence), who will do it (resources, responsibility), how long it will take (durations, schedule), and how much it will cost (budget).

The Project Management Process

- **Establish project objective:** The objective must be agreed upon by the sponsor or customer and the organization that will perform the project.

- **Define scope:**
- A project scope document must be prepared.
- It should include customer requirements, define the major work tasks or elements, as well as provide a list of deliverables and associated acceptance criteria that can be used to verify that the work and deliverables meet specifications.

The Project Management Process

- **Create a work breakdown structure:** Subdivide the project scope into pieces or work packages.
- Although projects may seem overwhelming when viewed as a whole, one way to conquer even the most monumental endeavor is to break it down into smaller components.
- A work breakdown structure (WBS) is a hierarchical decomposition of the project scope into work elements or items to be executed by the project team that will produce the project deliverables.

The Project Management Process

- **Assign responsibility**: The person or organization responsible for each work item in the work breakdown structure must be identified in order to inform the project team of who is responsible and accountable for the performance of each work package and any associated deliverables.

- **Define specific activities:** Review each work package in the work breakdown structure and develop a list of the detailed activities that need to be performed for each work package and to produce any required deliverables.

The Project Management Process

- **Sequence activities:** Create a network diagram that shows the necessary sequence and dependent relationships of the detailed activities that need to be performed to achieve the project objective

The Project Management Process

- **Estimate activity resources**. Determine the types of resources, such as the skills or expertise required to perform each activity, as well as the quantity of each resource that may be needed.
- Resources include people, materials, equipment, etc., that may be required to perform each activity.
- Resource estimates must consider the availability of each type of resource, whether it is internal or external (such as subcontractors), and the quantity available over the duration of the project.
- Designate a specific individual to be responsible for each activity.

The Project Management Process

- **Estimate activity durations:** Make a time estimate for how long it will take to complete each activity, based on the estimate of the resources that will be applied.

- **Develop project schedule:** Based on the estimated duration for each activity and the logical relationships of the sequence of activities in the network diagram, develop the overall project schedule, including when each activity is expected to start and finish, as well as the latest times that each activity must start and finish in order to complete the project by the project required completion date.

The Project Management Process

- **Estimate activity costs:** Activity costs should be based on the types and quantities of resources estimated for each activity as well as the appropriate labor cost rate or unit cost for each type of resource.

The Project Management Process

- **Determine budget:** A total budget for the project can be developed by aggregating the cost estimates for each activity.
- Similarly, budgets can be determined for each work package in the work breakdown structure by aggregating the cost estimates for the detailed activities for each work package.
- Other costs, such as project or organizational administrative, indirect, or overhead costs should also be included in the budget and be appropriately allocated to each activity or work package.

Controlling Projects

- Establish a baseline plan.
- Monitor progress.
- Measure actual progress and compare it to planned progress.
- Take corrective action if the project is behind schedule, overrunning the budget, or not meeting technical specifications.

Project Success

- **Project Efficiency** - Internal Project Objectives such as meeting time and budget goals.
- **Impact on the Customer** - Immediate and long-term benefit to the customer
- **Direct and Business Success** - Direct contribution to the organization (usually not observable until the medium term)
- **Preparing the Future** - Future opportunity (e.g. competitiveness or technical advantage typically expected in the long term.)

Shenhar, Levy, and Dvir (1997)

Project Success

Primary Success Category	Measurable Key Success Indicators (KSIs)
Internal Project Efficiency (Pre-completion)	- Meeting schedule - Completing within budget - Other resource constraints met
Impact of the Customer (Short term)	- Meeting functional performance - Meeting technical specifications & standards - Favorable impact on customer, customer's gain - Fulfilling customer's needs - Solving customer's problem - Customer is using product - Customer expresses satisfaction
Business and Direct Success (Medium term)	- Immediate business/commercial recognition - Immediate revenue & profits enhanced - Larger market share generated
Preparing for the Future (Long term)	- Will create new opportunities for the future - Will position customer competitively - Will create new market - Will assist in developing new technology - Will add/has added capabilities & competencies

- Project efficiency
- Impact on the customer
- Business impact on the organization
- Opening new opportunities for the future

Project Management Organizations

- The Project Management Institute, founded in 1969, is the major project management organization.
- The Project Management Institute (PMI) is a premier worldwide not-for-profit association for practitioners in the project management profession and individuals who want to learn more about the profession.
- Grew from 7,500 members in 1990 to over 320,000 in 2010
- PMI publishes A Guide to the Project Management Body of Knowledge (PMBOK® Guide), which provides a framework of processes and guidelines for the application of project management concepts, practices, and techniques.
- Other organizations
  - Association for Project Management
  - International Project Management Association

Benefits of Project Management

- Satisfied customers
- Additional business
- Expansion of career opportunities
- Satisfaction of being on a winning team
- Improved knowledge and skills

When projects are successful, everybody WINS