Introduction

Project Characteristics

- Defined goal or objective stated by the owner and accomplished by the project team
- Specific tasks to be performed
- Defined beginning and end
- Resources being consumed. The 4 Ms (Manpower, Machinery, Materials, and Money)
- As the project progresses, the project team learns more about the project
Introduction

**Project Life Cycle**

The project life cycle may be viewed as a process through which a project is implemented from beginning to end.

- From the owner’s Perspective

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**Project Life Cycle (Project stages)**

- Preconstruction
- Procurement
- Construction
- Closeout

As the construction progresses, the cost increases while the influence decreases.
Introduction

Project Life Cycle (1. Pre-construction)

1. Conceptual planning 2. Schematic Design

- Conceptual planning
  - Very important for the owner (e.g., big store chains)
  - During this stage the owner hires key consultants including the designer and project manager, selects the project site, and establish a conceptual estimate, schedule, and program
  - The owner must gather as much reliable information as possible about the project
  - The most important decision is to proceed with the project or not

- Schematic Design
  - During this phase, the project team investigates alternate design solutions, materials and systems.
  - Apply Value Engineering
  - Completion of this stage represents about 30% of the design completion for the project
Introduction

**Project Life Cycle (1. Pre-construction)**

1. Conceptual planning  
2. Schematic Design  
3. Design Development  
4. Contract Documents

- **Design Development**
  - Designing the main systems and components of the project.
  - Good communication between owner, designer, and construction manager is critical during this stage because selections during this design stage affect project appearance, construction and cost.
  - This stage takes the project from 30% design to 60% design

- **Contract Documents**
  - Final preparation of the documents necessary for the bid package such as the drawings, specifications, general conditions, and bill of quantities.
  - All documents need to be closely reviewed by the construction manager and appropriate owner personnel to decrease conflicts, and changes.
  - With the contract documents are almost complete; a detailed and complete cost estimate for the project can be done. Designing the main systems and components of the project.
Introduction

Project Life Cycle (2. Procurement)

Also called Bidding and award phase

- The project formally transits from design into construction
- This stage begins with a public advertisement for all interested bidders or an invitation for specific bidders
- In fast-track projects, this phase overlaps with the design phase
- If the project is phased, each work package will be advertised and bid out individually
- It is very important stage to select highly qualified contractors. It is not wise to select the under-bid contractors

Introduction

Project Life Cycle (3. Construction)

- The actual physical construction of the project
- This stage takes the project from procurement through the final completion
- It is the time where the bulk of the owner's funds will be spent
- It is the outcome of all previous stages (i.e., good preparation means smooth construction)
- The consultant will be deployed for contract administration and construction supervision
- Changes during construction may hinder the progress of the project
Introduction

Project Life Cycle (4. Closeout)

- Transition from design and construction to the actual use of the constructed facility
- In this stage, the management team must provide documentation, shop drawings, as-built drawings, and operation manuals to the owner organization (as-built drawings are the original contract drawings adjusted to reflect all the changes that occurred)
- Assessment of the project team’s performance is crucial in this stage for avoiding mistakes in the future.
- Actual activity costs and durations should be recorded and compared with what was planned. This will serve as the basis for the estimating and scheduling of future projects.

Introduction

Types of Construction Projects

- Most designers and contractors tend to focus their efforts within specialty areas

Four Categories are identified:

1. Residential Housing 2. Building Construction
3. Industrial 4. Infrastructure

This classification is based on:

- The way the projects are funded
- The technologies involved
- The way the owner, designer, and builder interact
Introduction

Types of Construction Projects

1. Residential Housing  
2. Building Construction  
3. Industrial  
4. Infrastructure

Residential housing

- Include: homes, apartments, and low and high-rise buildings
- Funded by individual owners for their own use or by developers for profit
- They use fairly low technologies and requires little investment
- Large number of small designers, builders, and suppliers
- 1/3 of construction spending is on residential construction
- The builder or the owner can design

Non-residential Building Construction

- Office buildings, large apartment buildings, malls, theaters,.....
- It depends on the economy of a specific region
- Most of these projects are privately funded
- Designed by architect and engineer, and built by general contractor
- These buildings use technical support more than that in residential buildings
Introduction

Types of Construction Projects

1. Residential Housing    2. Buildings Construction
3. Industrial            4. Infrastructure

Industrial

- Examples include: factories, petroleum refineries....
- It is defined more by the production activities within the facility
- In capitalism countries, most of these facilities are privately funded
- Only few designers and builders are qualified to bid in these projects
- These projects are the most technical of all

Infrastructure and Heavy Construction

- Examples: roadways, bridges, water and sewer systems
- Designed by civil engineers and built by heavy construction contractors
- Publicly funded and affected by the government policy
- Long in duration
- Less sensitive to the ups and downs of the economy
- Heavy use of equipments
- Build Operate Transferee (BOT)
Introduction

Project Participants

- Different classifications and many participants are involved in a construction project

Main Project Participants

1. The Owner
2. Design Professionals
3. Construction Professionals
4. Project Manager

The Owner or the Client

- Is the person or organization that will pay the bills

Owner Organizations

- Public (e.g., government agencies)
- Private: individual, corporations, partnership
Introduction

Project Participants

1. The Owner 2. Design Professionals
3. Construction Professionals 4. Project Manager

Responsibilities

- What the project will include (scope and objectives)
- When the project can begin and when must end (schedule)
- How much can spend (budget)

Formation

- Large companies have divisions to set up these tasks
- Small business can hire project manager, consultants, etc.....

Design Professional

- Examples are: architects, engineers, consultants
- Depending on the owner size, they can be part of the owner’s organization or hired
- In some cases, the design professional & construction contractor together form a design-build company
Introduction

Project Participants

1. The Owner  
2. Design Professionals  
3. Construction Professionals  
4. Project Manager

Design Professional Responsibilities

- Assist the owner in developing the project scope, budget, and schedule
- Prepare construction documents for bidding and construction

Architect

- Is an individual who plan and design buildings. Sometimes they define and provide the whole envelope of the whole project

Engineer

- An individual or a firm who perform specialized work associated with the design or construction
- They usually classified as civil, mechanical, electrical

Engineering-Construction Firm

- An organization that combines both architect/engineering and construction
- Has the capability of performing of what called design-build
Introduction

Project Participants

1. The Owner
2. Design Professionals
3. Construction Professionals
4. Project Manager

Construction Professional

- Named as the contractor
- Responsible for physical construction of the project
- In traditional system where the owner, design, and contractors are separate, the contractor named a prime contractor
- The prime contractor may divide the work among subcontractors
Introduction

Project Participants

1. The Owner  2. Design Professionals  
3. Construction Professionals  4. Project Manager

Project Manager

- Named by the owner
- Responsible for the overall coordination of the project
- Clear definitions of the goals of the project.
- Investigate alternative solutions for the problems.
- Develop a detailed plan to make the selected program reality.
- Implement the plan and control the project