CB 311
Introduction to Construction Management

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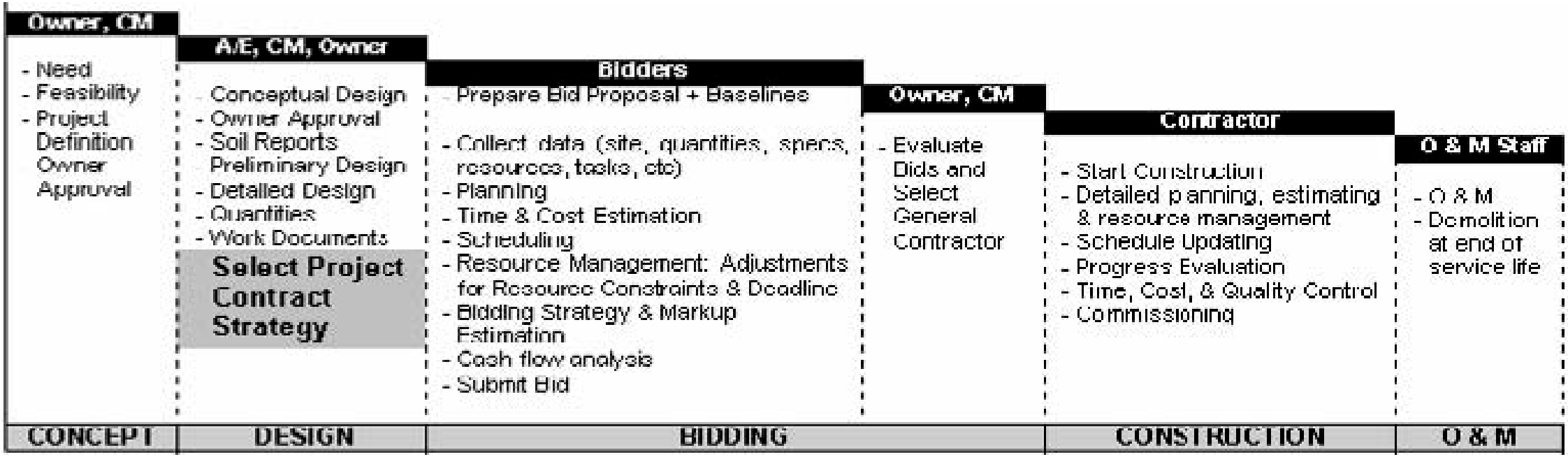
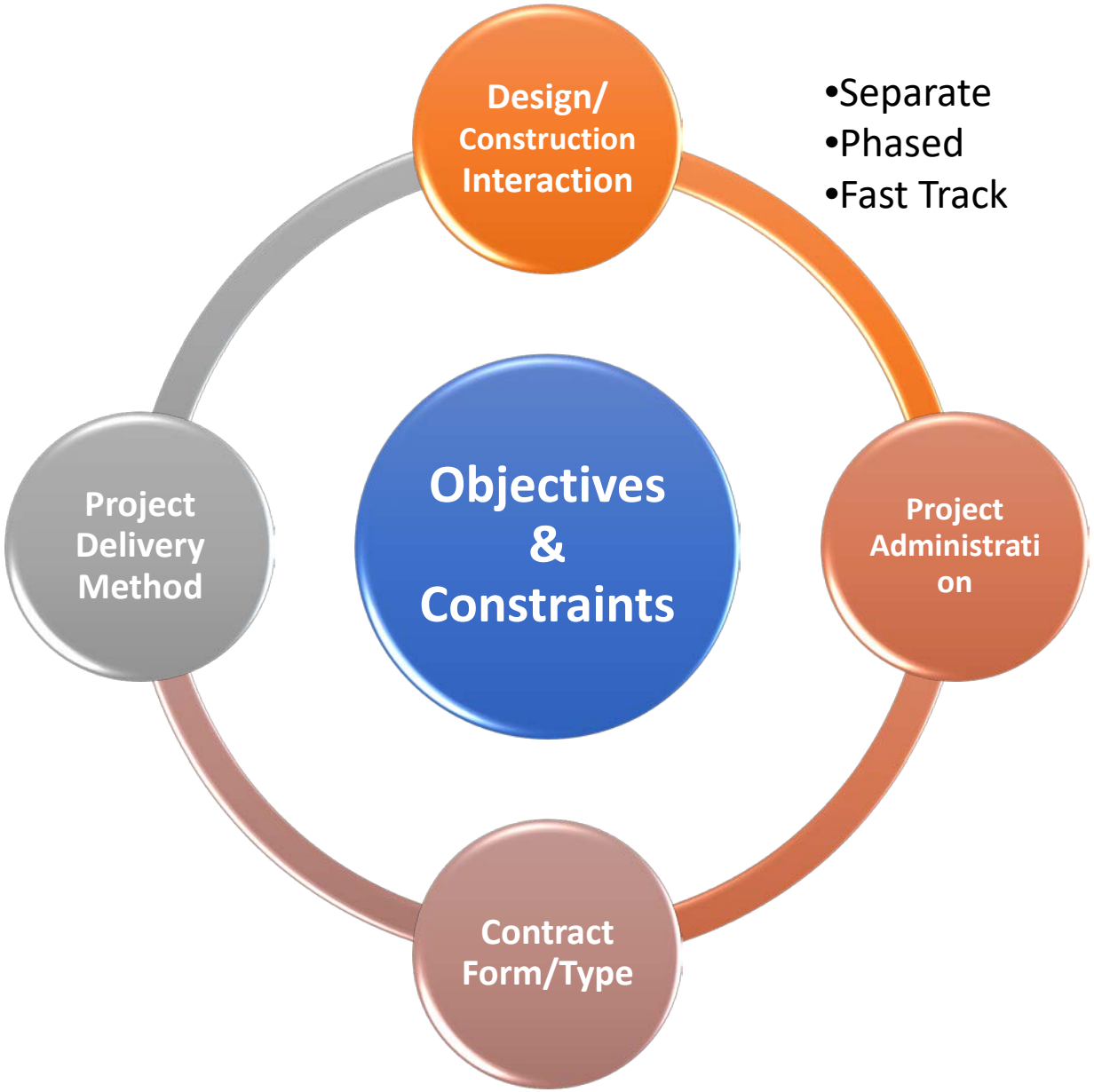
Project Contract Strategy

Understanding the factors affecting the contract selection and construction project management

Project Life Cycle





- Separate
- Phased
- Fast Track

- Traditional
- Construction Management (CM)
- Project Management (PM)
- Integrated Project Delivery (IPD)

- Competitive Bidding
- Negotiated Cost Plus
- Combination

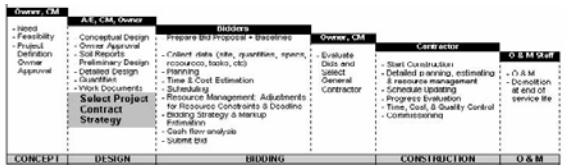
- Traditional
- Design-Build
- TurnKey
- BOT

Objectives

- **Time**: Time here refers to the start of construction phase and/or the total project duration. There are types of contracts that would allow overlapping between the project phases to meet such needs.

- **Cost**: if cost is a paramount for the owner, there a types of contracts that allow him/her to incentivizes the contractor to reduce cost, while achieving the desired quality.

- **Performance**: Project performance refers to (1) end product performance and value, and (2) the work performance of the job site. If this objective is top ranked by the owner, a contracting strategy that accommodates changes, “Value Engineering” and maximize teamwork performance may become desirable.



Constraints

- There are number of constraints that affect the project contract selection.
- Define some of construction project constraints

- Conditions of contract - Method of tender - Project size and duration - Project location - Relationship to other projects - Possession of land - Number of work packages	- Target dates of the project - Possibility of design changes - Availability of construction resources - Freedom to choose designers and contractors - Adequacy of site investigation - Seasonal working	- Access to the site - Number of contractors willing to tender - Inflation - Exchange-rate - Union Regulations

Project Delivery Methods

- Traditional Approach - Design, Bid, Build (DBB)

Design has to be completed before construction can start. Design and construction are usually performed by two different parties who interact directly and separately with the owner.

Advantages	Disadvantages
- Price competition - Total cost is known before construction starts - Well documented approach used in most government projects done for public works	- Long time - Design does not benefit from construction experience - Conflicts between owner & G.C. and between A/E & G.C. - Changes may lead to disputes and claims

Project Delivery Methods

- Design-Build

  Single organization is responsible for performing both design and construction and, in some cases, providing a certain “know-how” for the project.

  Design strongly influenced by the method of construction.

Advantages	Disadvantages
- One contract that may include know-how - Minimum owner involvement - Time can be reduced if the design-build company overlaps design and construction - Possible coordination between design and construction - Easier implementation of changes - Less adversary relationships	- Cost may not be known until the end of design - High risk to contractor and more cost to owner - Design-Build company may reduce quality to save cost - Due to minimal owner involvement, result may not be to his satisfaction

Project Delivery Methods

- **Turnkey**:

  Similar to the design-build approach but with the organization being responsible for performing both design, construction, know-how (if any), and project financing. Owner payment is then made at the completion (when the contractor turns over the “key”).

  Franchise projects in which a new branch of a restaurant chain needs to maintain the same design, construction quality, and food service quality.

Project Delivery Method

- Build Operate Transfer (BOT)

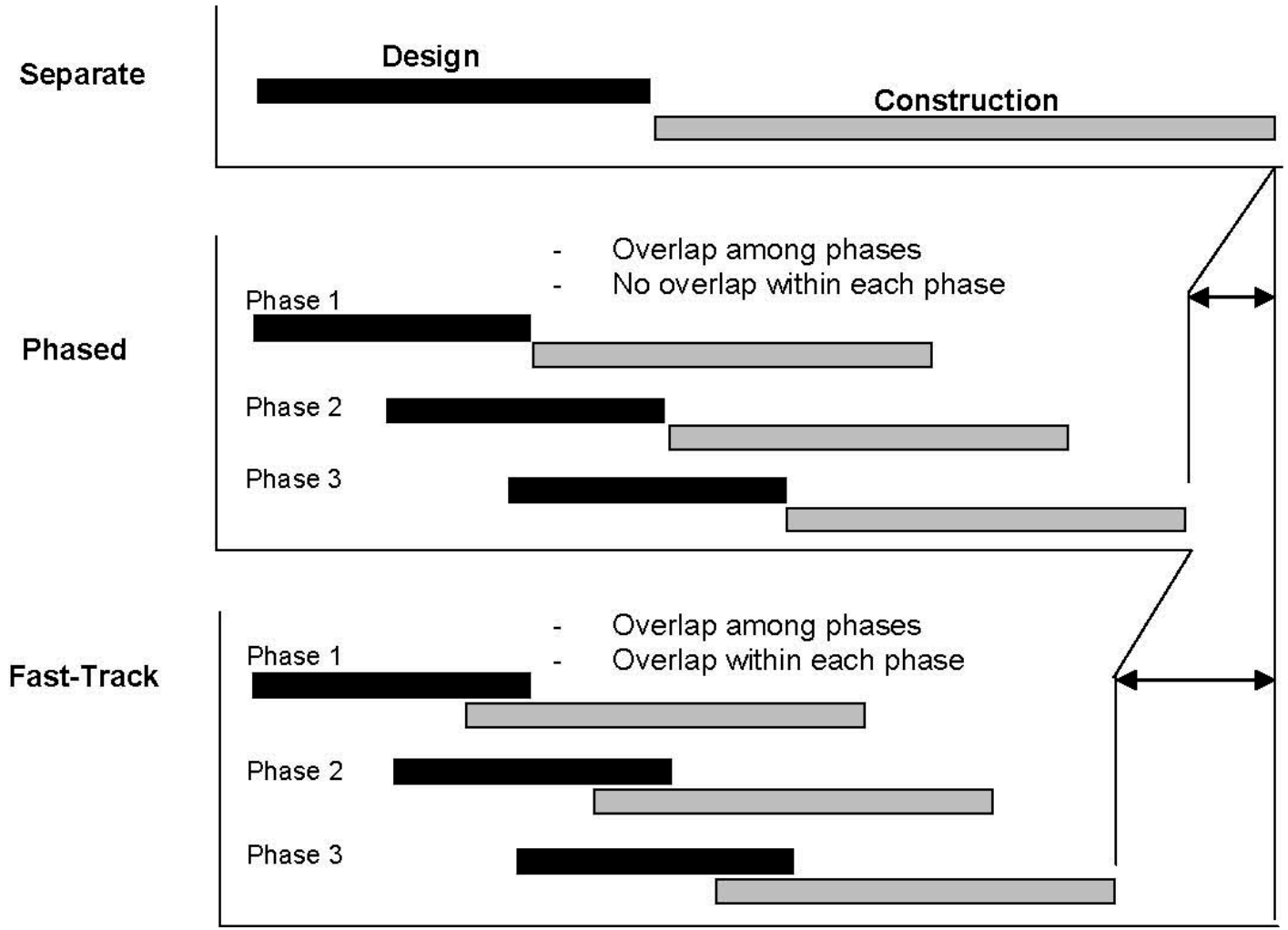
The contractor build the project, operates its to obtain some profit, then transfer the project back to the owner after a specified amount of time.

Examples

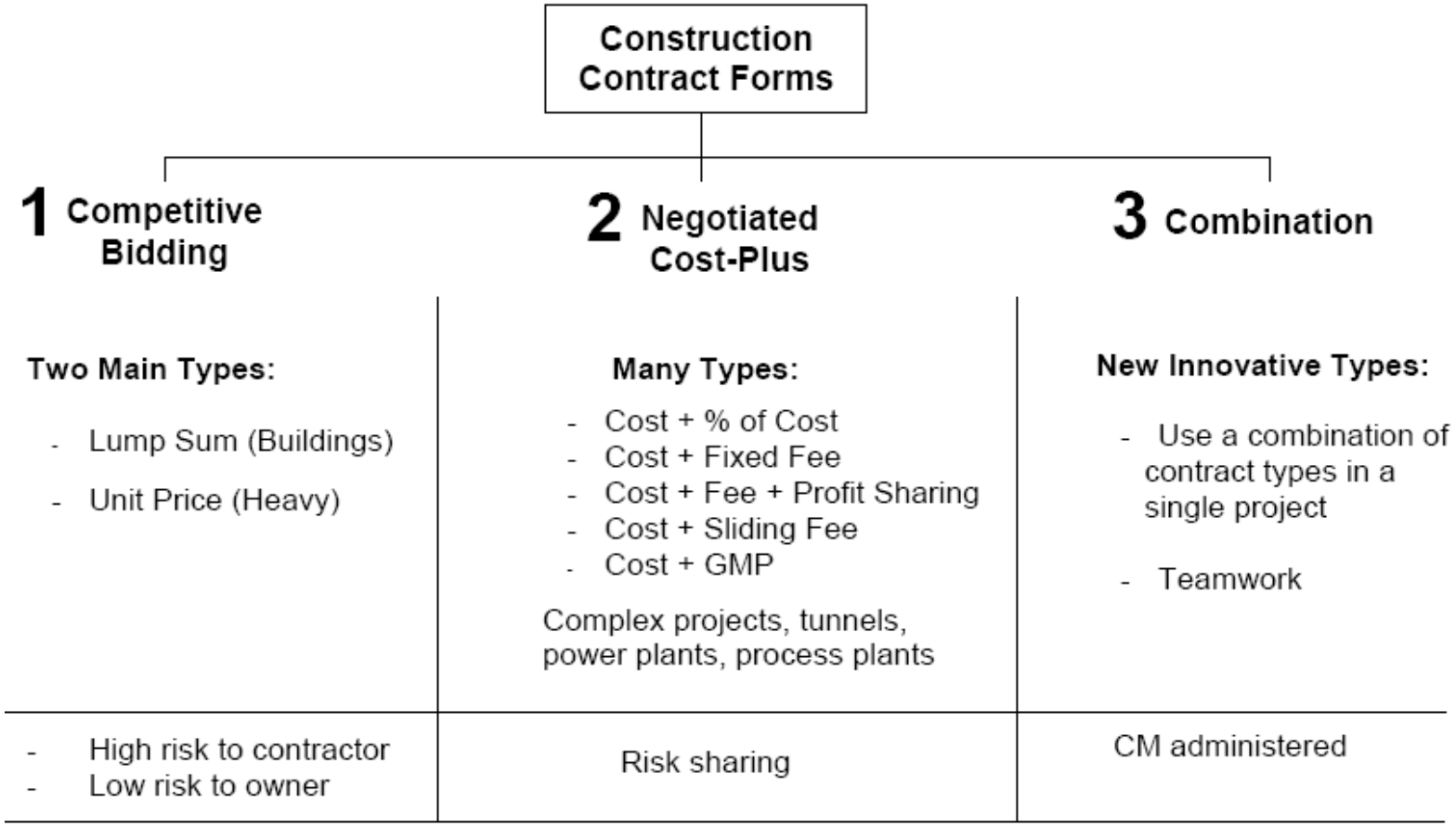
- Provide some project examples suitable for each of the PDM

  - Design, Bid, Build
  - Design Build
  - Turnkey
  - BOT

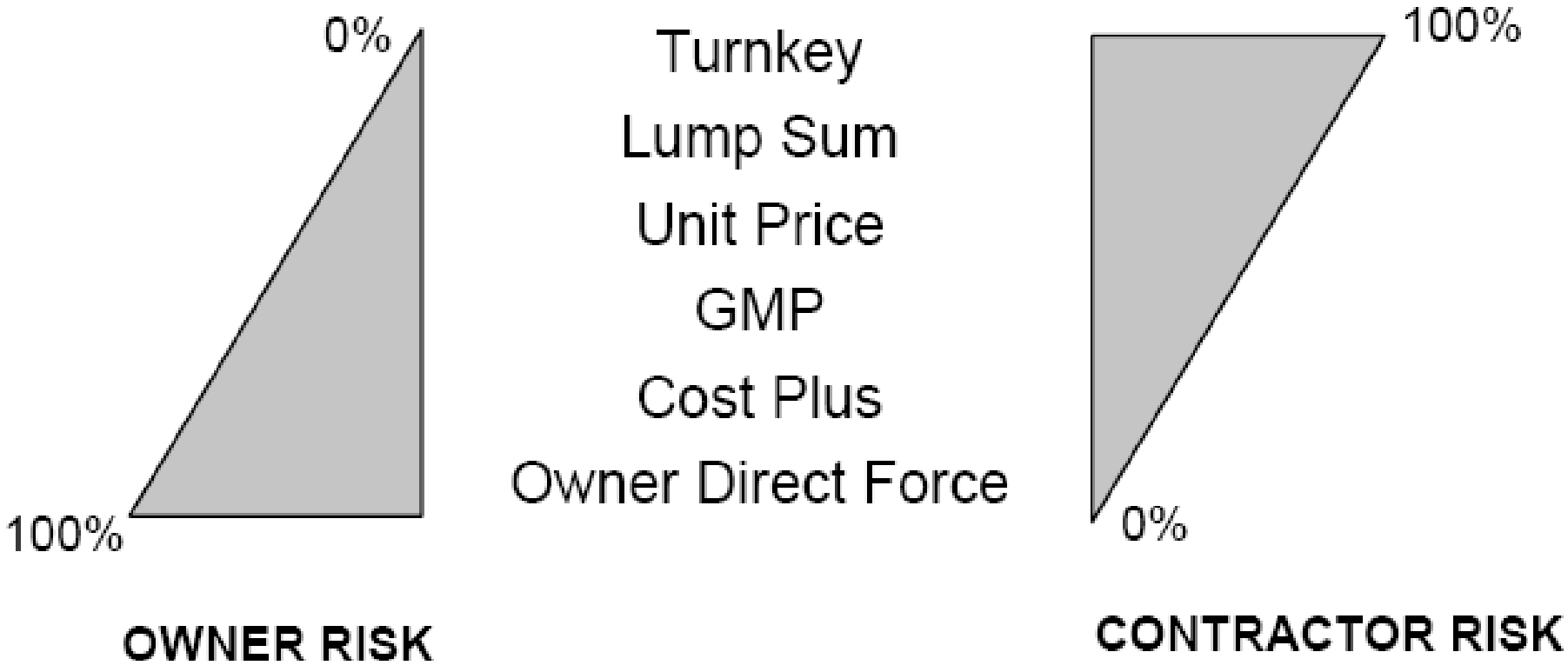
Design/Construction Interactions



Contract Form/Type



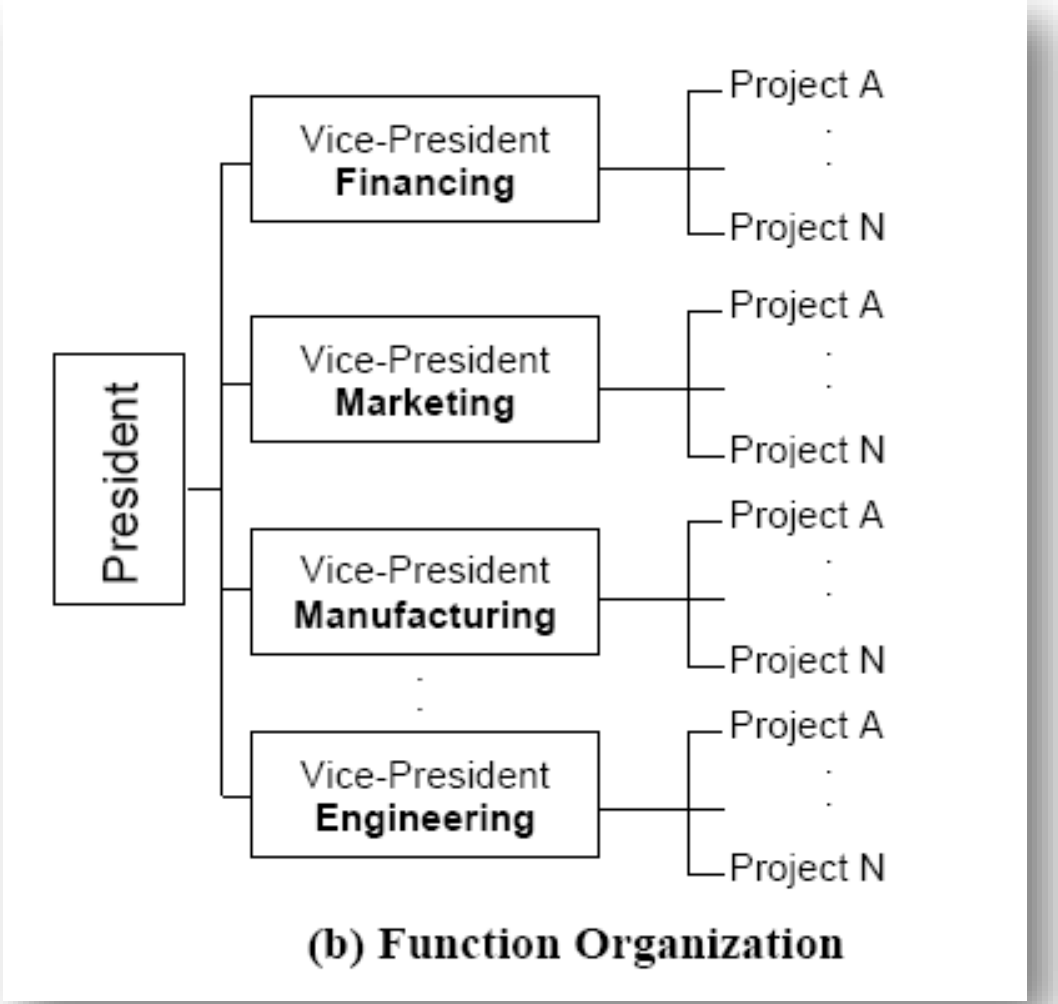
Owner/Contractor Financial Risk



Organization Structure

- There are three main forms of organization structures:
  - Traditional Organization Structure (also known as Classical, Functional or Departmental).
  - Project (Program) Organization Structure.
  - Matrix Organization Structure.

Organization Structure



(b) Function Organization

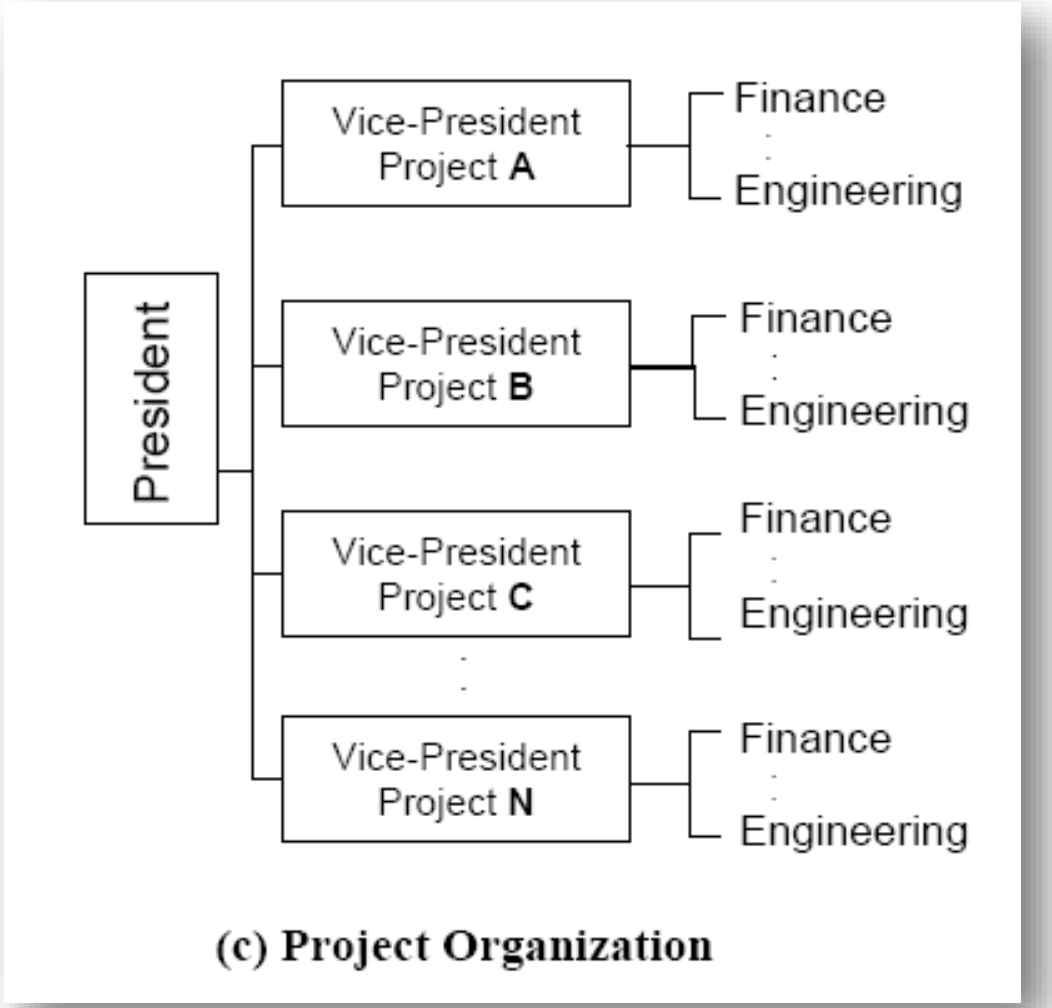
Advantages

- Easier budgeting and cost control
- Better technical control
- Specialists can be grouped to share knowledge and responsibility.
- Personnel can be used on many different projects.
- All projects will benefit from the most advanced technology.
- It provides flexibility in the use of manpower.
- Policies, procedures, and lines of responsibility are easily defined and understandable.
- Good control over personnel, since each employee has one and only one person to report to.
- Communication channels are vertical and well established

Disadvantages

- Decisions normally favor the strongest functional groups.
- No one individual is directly responsible for the total project.
- There is no customer focal point.
- Response to customer needs is slow.
- There is difficulty in pinpointing responsibility, this is the result of little or no direct project reporting, very little project-oriented planning and no project authority.
- Motivation and innovation are decreased.
- Ideas tend to be functionally oriented with little regard for ongoing projects.
- Difficulty in identifying profitable from unprofitable projects.
- Develop strong resistance to change

Organization Structure



(c) Project Organization

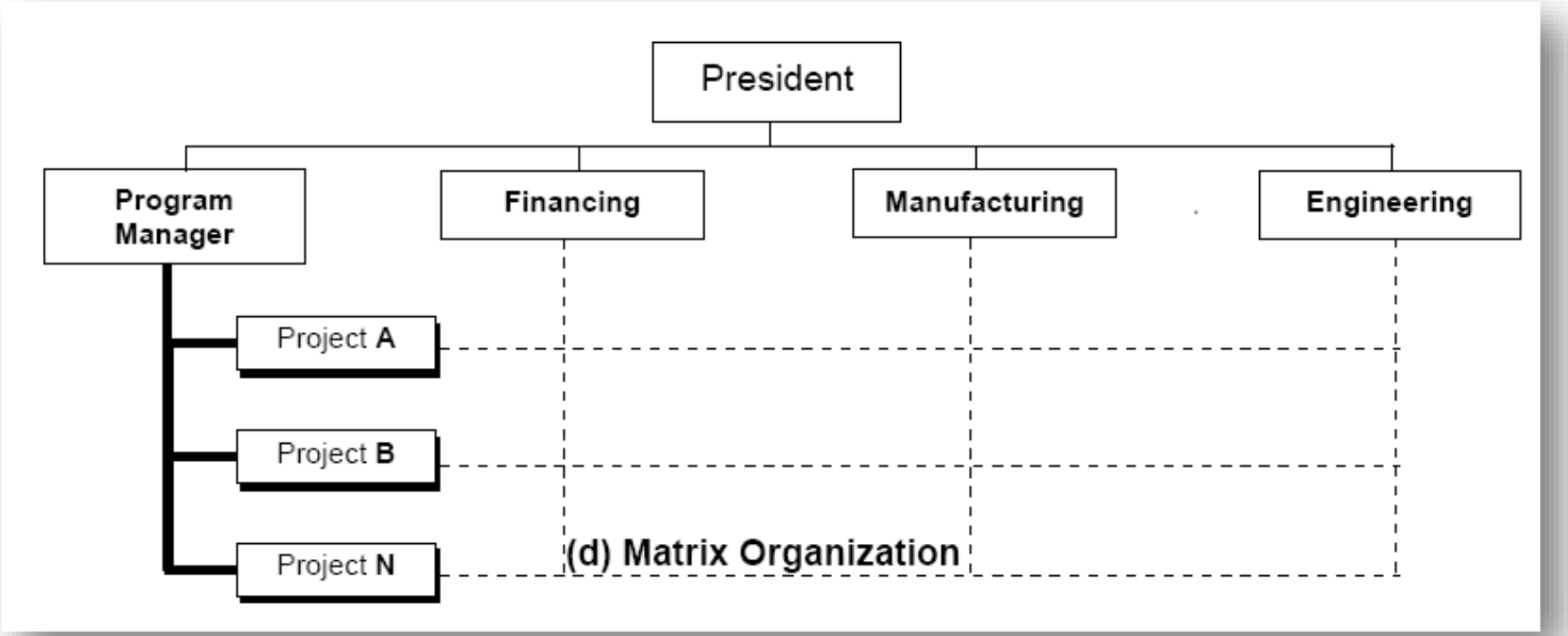
Advantages

- It provides complete line authority over the project.
- The project participant work directly for the project manager.
- Unprofitable projects are easily identified and can be eliminated.
- Strong communications channels.
- Personnel are loyal to the project.
- Focal point for out of company customer relations.
- Flexibility in determining time (schedule), cost and performance trade-offs.
- Upper-level management maintains more free time for executive decision making.

Disadvantages

- Inefficient usage of resources (duplication of effort, facilities and personnel).
- Tendency to retain personnel on a project long after they are needed.
- Technology suffers because of no strong functional groups.
- Lack of opportunities for technical interchange among projects.

Organization Structure

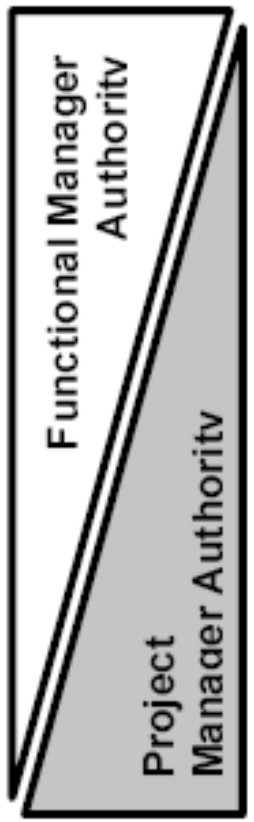


Advantages

- The project Manager maintains maximum project control.
- The project manager has the authority to commit company resources.
- Each person has a "home" after project completion.
- A strong technical base can be developed.
- Functional organization exists primarily as support for the project
- Key people can be shared ----> program cost is minimized
- Authority and responsibility are shared.
- Stress is distributed among the team.
- Procedures can be set up independently for each project.

Disadvantages

- Multidimensional information / work flow.
- Double reporting.
- Potential for continuous conflict and conflict resolution
- Management goals differ from project goals.
- Difficulty in monitoring and controlling.
- More effort and time are needed initially to define procedures.
- Functional manager maybe biased according to their own sets priorities.
- Balance of power between functional and project organization must be watched.



Function	Project is assigned to relevant functional areas.
Function – Matrix	A PM limited authority coordinates across different functional areas.
Balanced Matrix	A PM shares responsibility and authority with functional managers.
Project – Matrix	A PM is the prime authority. Functional personnel are used if needed.
Project	A PM is in charge of a team of personnel from functional areas.

(a) Comparison of Organization Structures

Benefits of Different Organization Structures

- A company undertaking multiple infrastructure projects (power plants) within Egypt (Cairo, Aswan, Hurghada, Sinai, etc.) with a large number of engineers and labors.

- A residential construction company operating in Cairo.

- A specialized contractor for flooring.