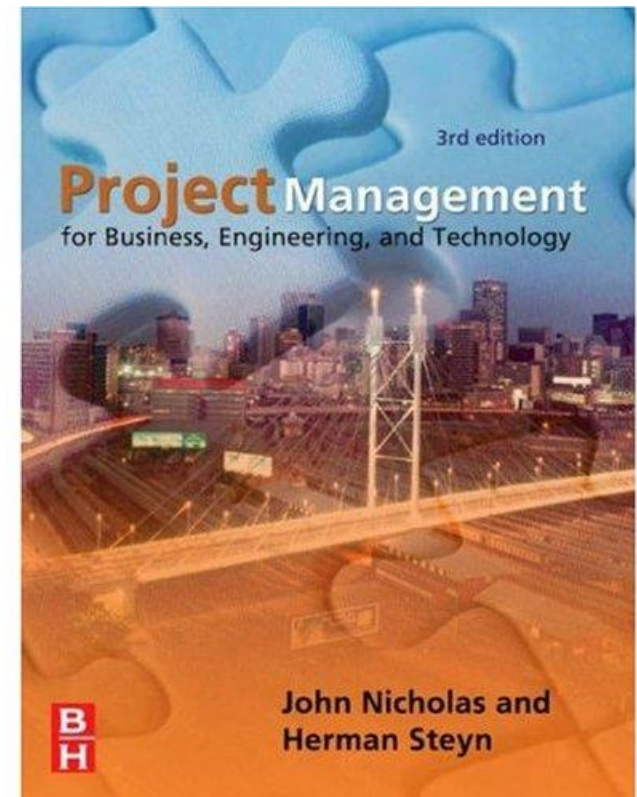# Chapter 13
Project Organizations

Project Management for Business, Engineering, and Technology

Prepared by
John Nicholas, Ph.D.
Loyola University Chicago
&
Herman Steyn
University of Pretoria

Project Organizations

- Ideally created to best suit the project

    - (form follows function)

- A project team is a temporary structure

- Usually multi-functional/multi organizational

- Led by project manager or project coordinator

Project Organizations, Basic Variations

- Traditional pyramid organization (hierarchical)

    - Single function vs. cross-functional task team

- Task force within traditional pyramid

- Pure project (project arm and stand alone)

- Matrix

Organization Structures

- The "perfect" structure does not exist

- Any structure can be made to work

- Not all structures equally good – it's horses for courses

- And its about more than just structure
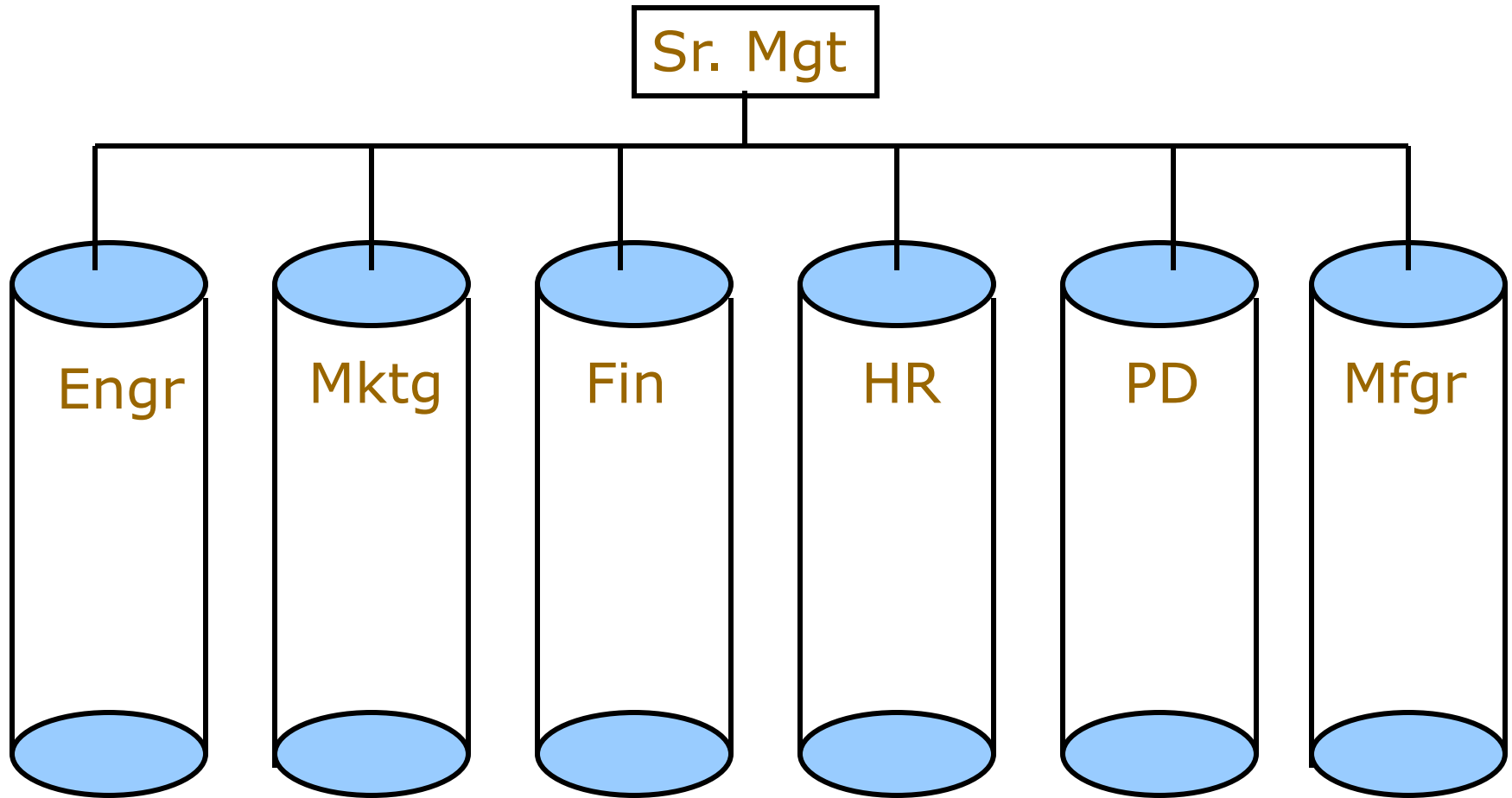
Traditional Pyramid Organization
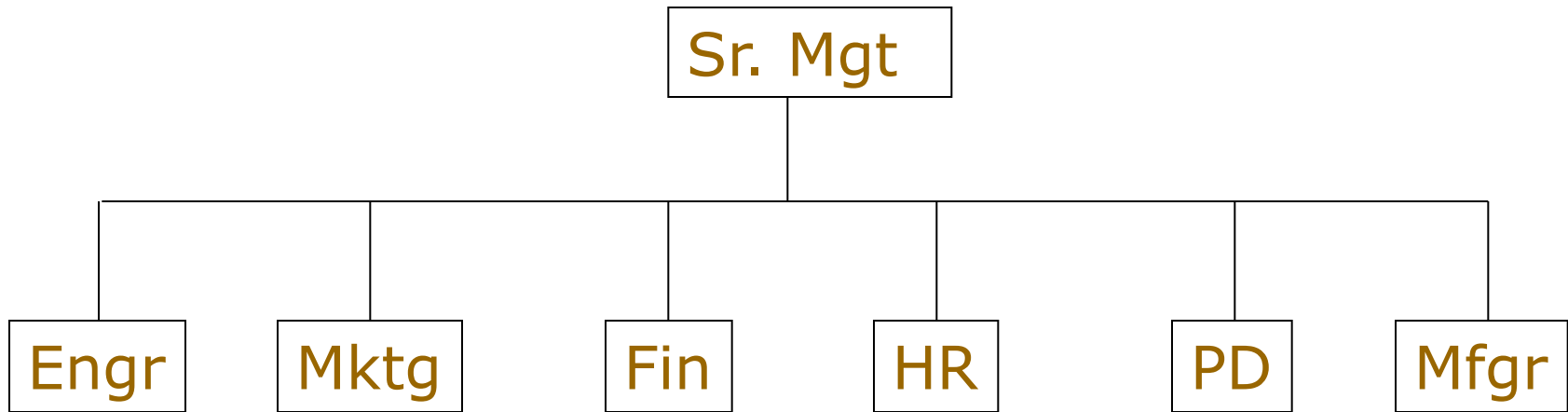
Traditional Pyramid Organization
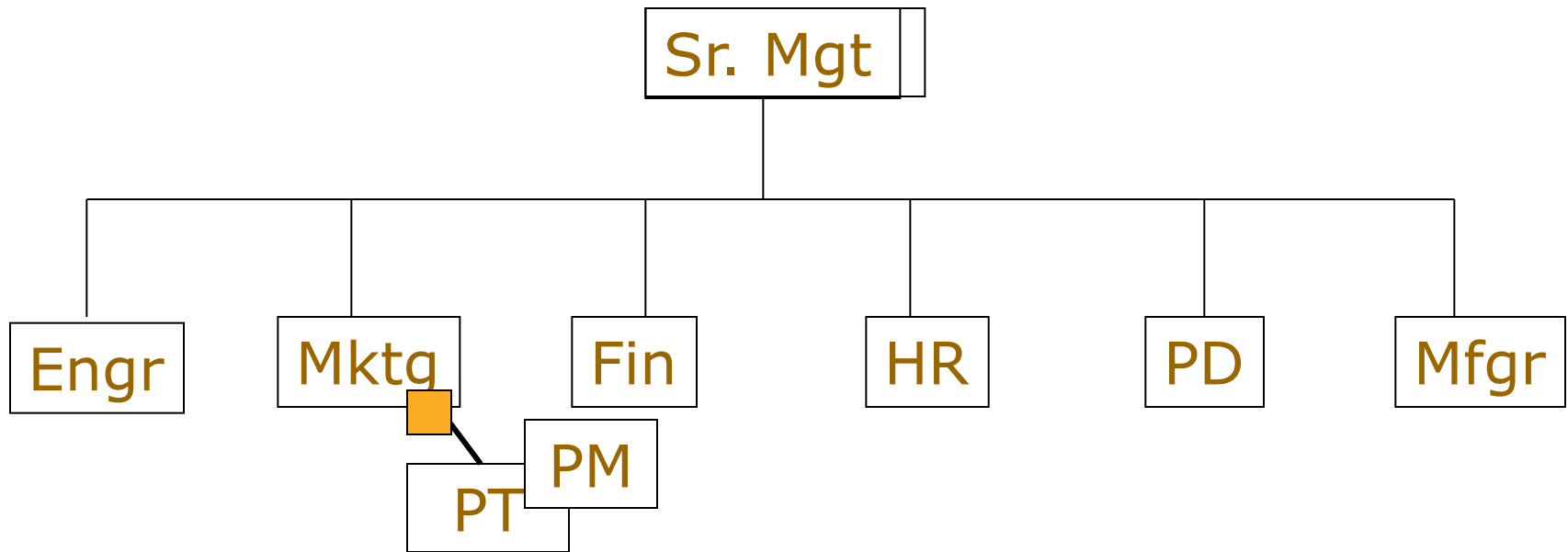
The reason: Differentiation

- Specialization necessitates differentiation

- Different bases of differentiation:

  Subject matter, Products, Geographic etc.

- Problem with differentiation / specialization:
  - Lack of integration
  - Losing sight of the bigger picture

Traditional Pyramid Organizations: Silos

```
                         ┌──────────┐
                         │ Sr. Mgt  │
                         └────┬─────┘
        ┌──────┬──────┬───────┼───────┬──────┬──────┐
      Engr   Mktg    Fin     HR      PD    Mfgr
```

Reason for silos: A manager is responsible only for *one part* of the organization's goal

Project within a Traditional Organization: Single Function Project

```
                    ┌──────────┐
                    │ Sr. Mgt  │
                    └────┬─────┘
        ┌────────┬───────┼───────┬────────┬────────┐
   ┌────┴──┐ ┌───┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐ ┌──┴──┐
   │ Engr  │ │ Mktg │ │ Fin │ │ HR  │ │ PD  │ │ Mfgr│
   └───────┘ └──────┘ └─────┘ └─────┘ └─────┘ └─────┘
```

Mktg — PM

PT

┌──────┐
│ PM │   = Project manager, team leader or coordinator
└──────┘

┌──────┐
│ PT │   = Project team
└──────┘

# Project within a Traditional Organization

- Pros
  - Functional units develop competencies

  - Good for single-function projects
    - because functional areas tend to be highly specialized and competent

Project within a Traditional Organization

- Con
  - Poor for cross-functional efforts
    - No coordination among functional areas
    - Functional areas tend to be self-serving
    - No project accountability

Project within a Traditional Organization: Multifunctional Task Force
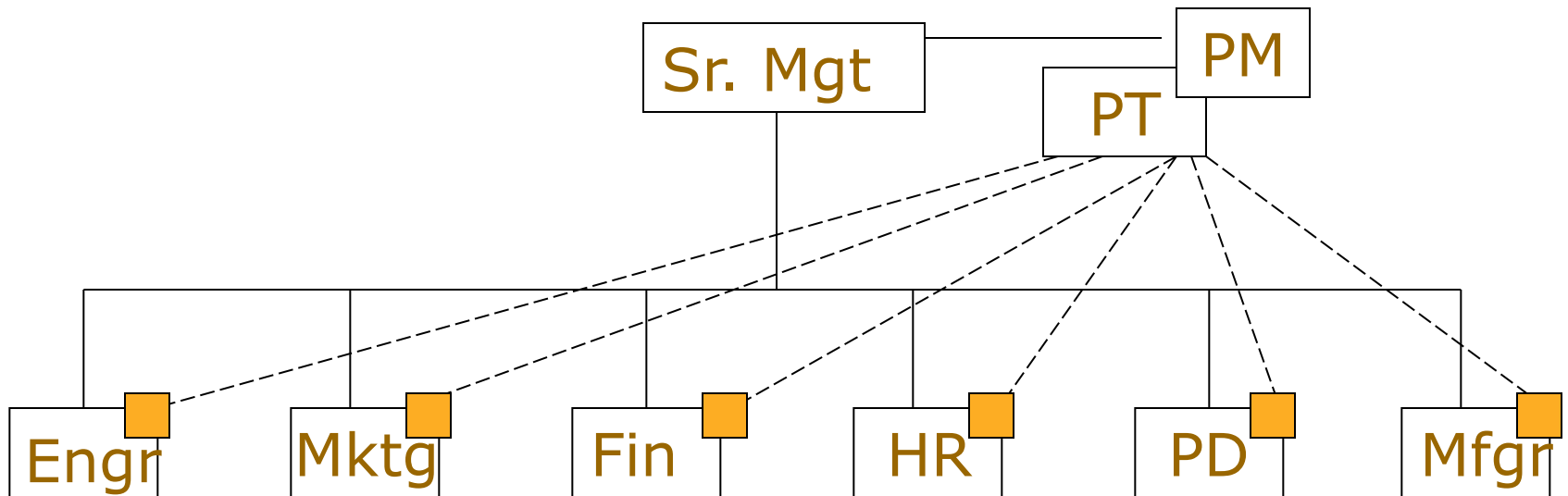
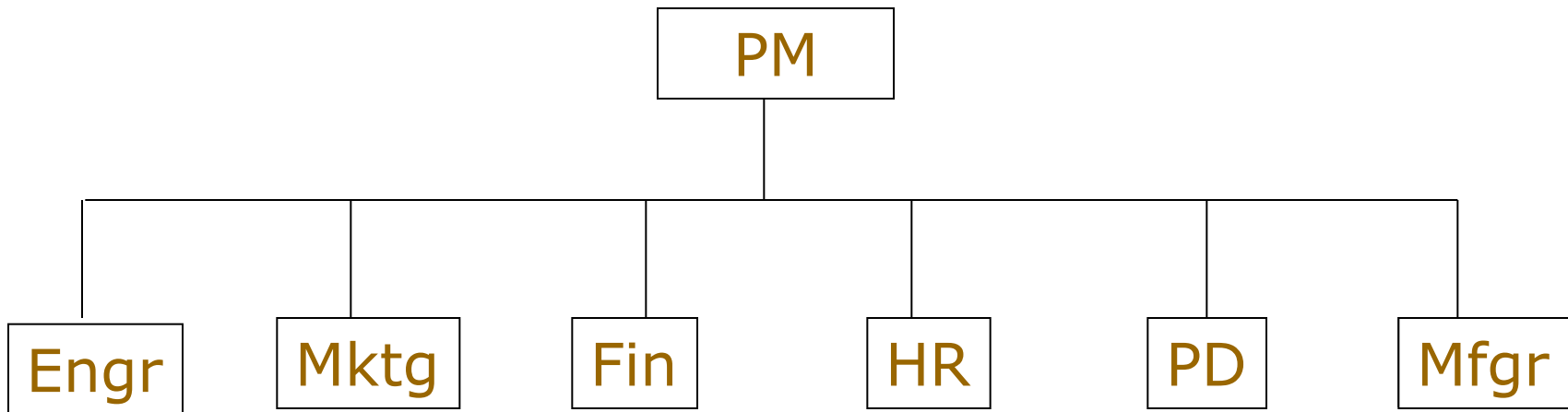# Multifunctional Task Force (cont'd)

- Pros
  - Project expeditor or coordinator oversees project work, schedules meetings, etc.

  - Expertise drawn from all areas contributing to or affected by the project
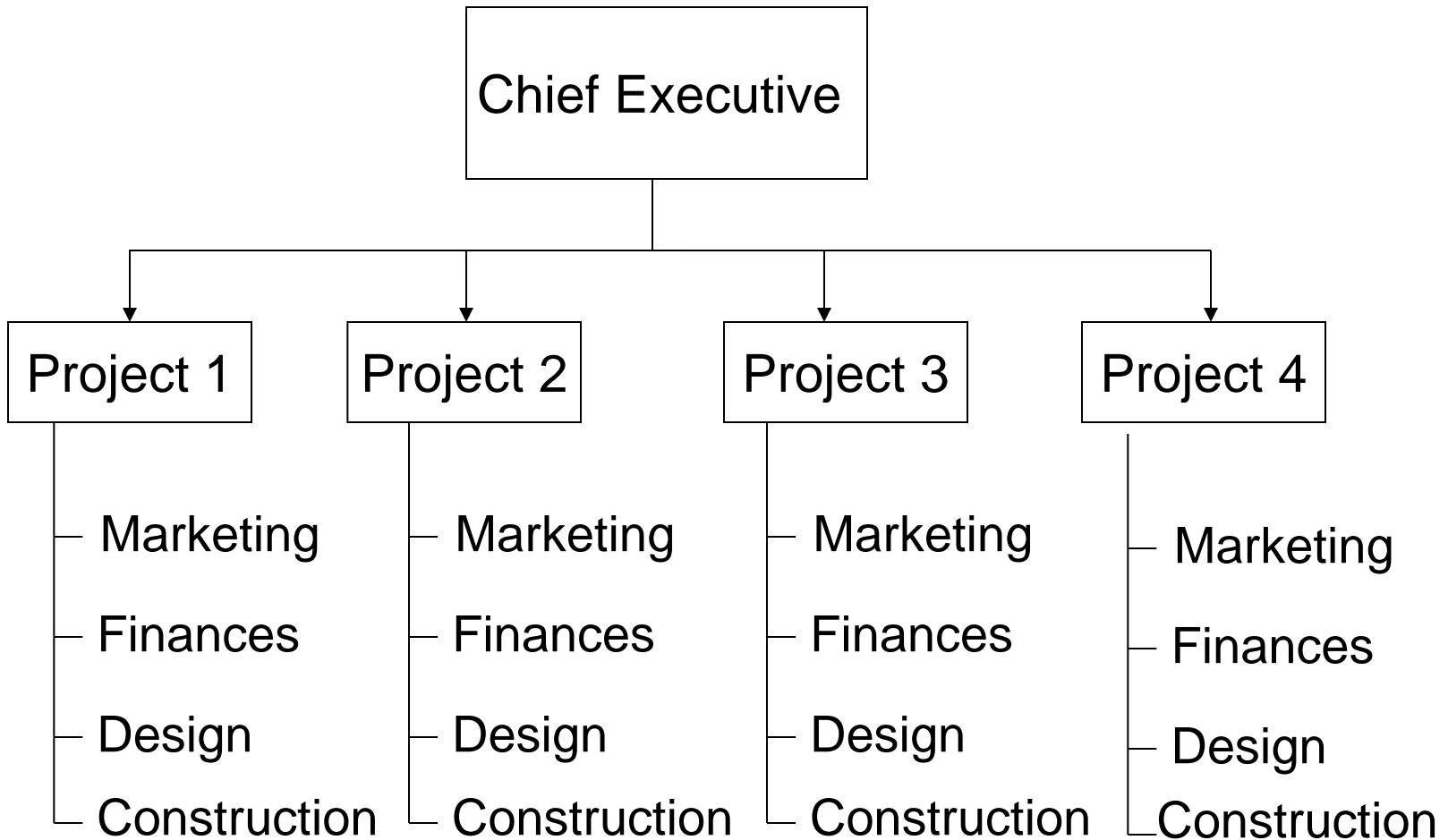
Multifunctional Task Force (cont'd)

- Cons
  - Authority of project leader is weak/ineffectual

  - Project is side-job for team members
    - Potential lack of focus, motivation
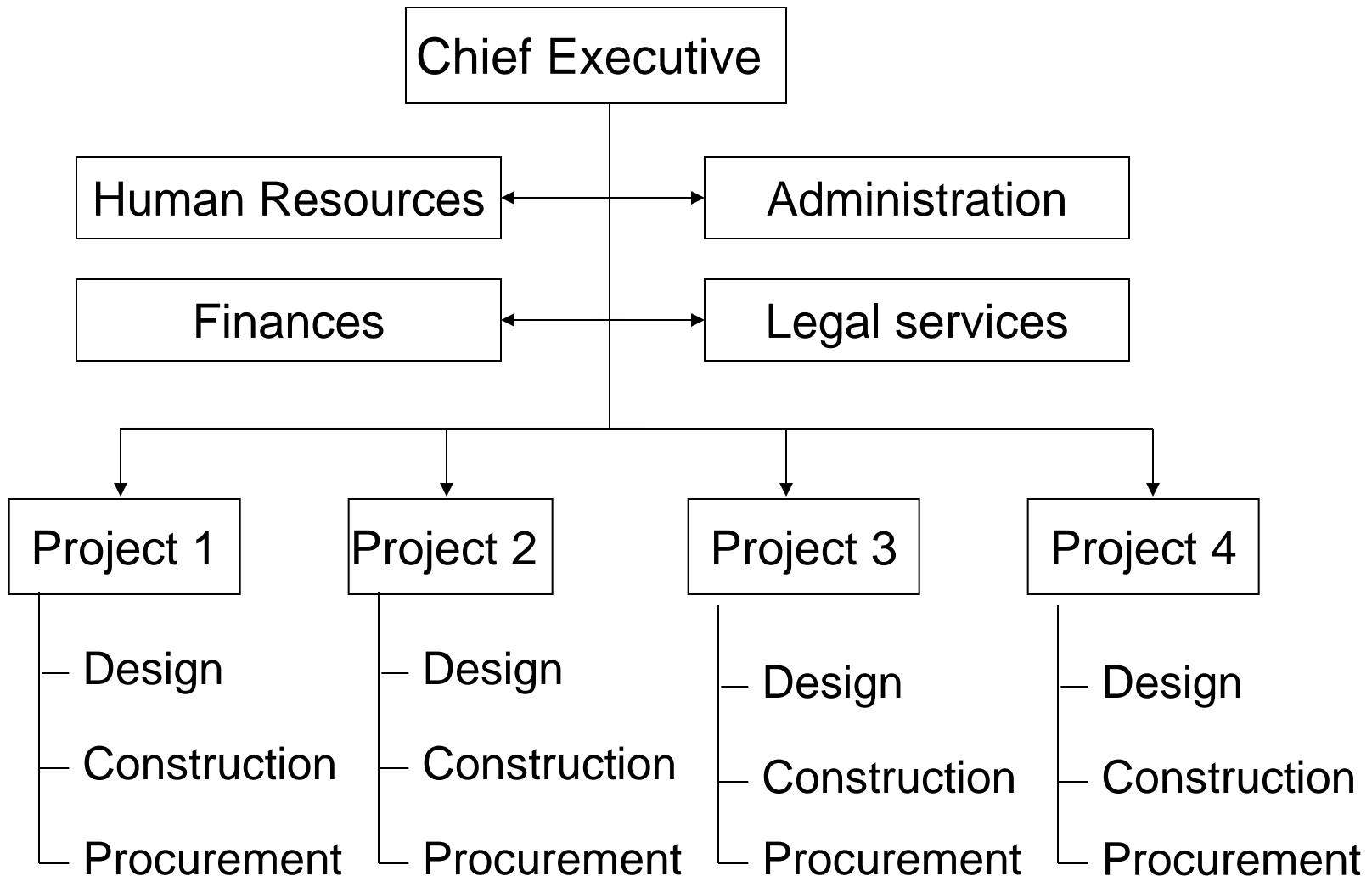
Pure Project—Stand Alone

The project IS the organization

```
                    ┌──────────┐
                    │    PM    │
                    └────┬─────┘
        ┌──────────┬─────┼──────┬─────────┬──────────┐
   ┌────┴───┐ ┌────┴───┐ │ ┌────┴───┐ ┌───┴───┐ ┌────┴────┐
   │  Engr  │ │  Mktg  │ │ │   HR   │ │  PD   │ │  Mfgr   │
   └────────┘ └────────┘ │ └────────┘ └───────┘ └─────────┘
                    ┌─────┴────┐
                    │   Fin    │
                    └──────────┘
```

Pure Project—Stand Alone

Pure Project - with Staff Functions Centralized

Chief Executive

Human Resources ← → Administration

Finances ← → Legal services

Project 1	Project 2	Project 3	Project 4
– Design	– Design	– Design	– Design
– Construction	– Construction	– Construction	– Construction
– Procurement	– Procurement	– Procurement	– Procurement

Pure Project—Stand Alone: Boston's Big Dig

Pure Project—Stand Alone Boston's Big Dig
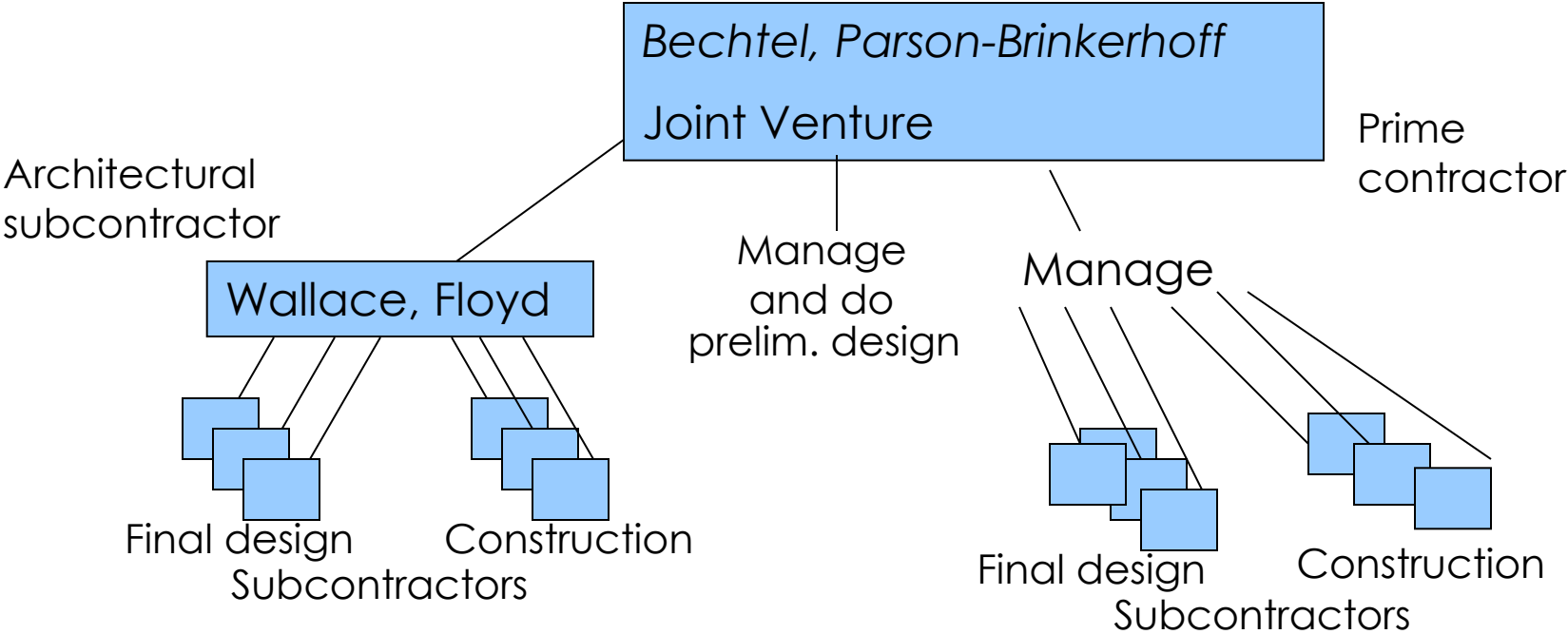
Pure Project—Projects as "Arms" to Parent Organization
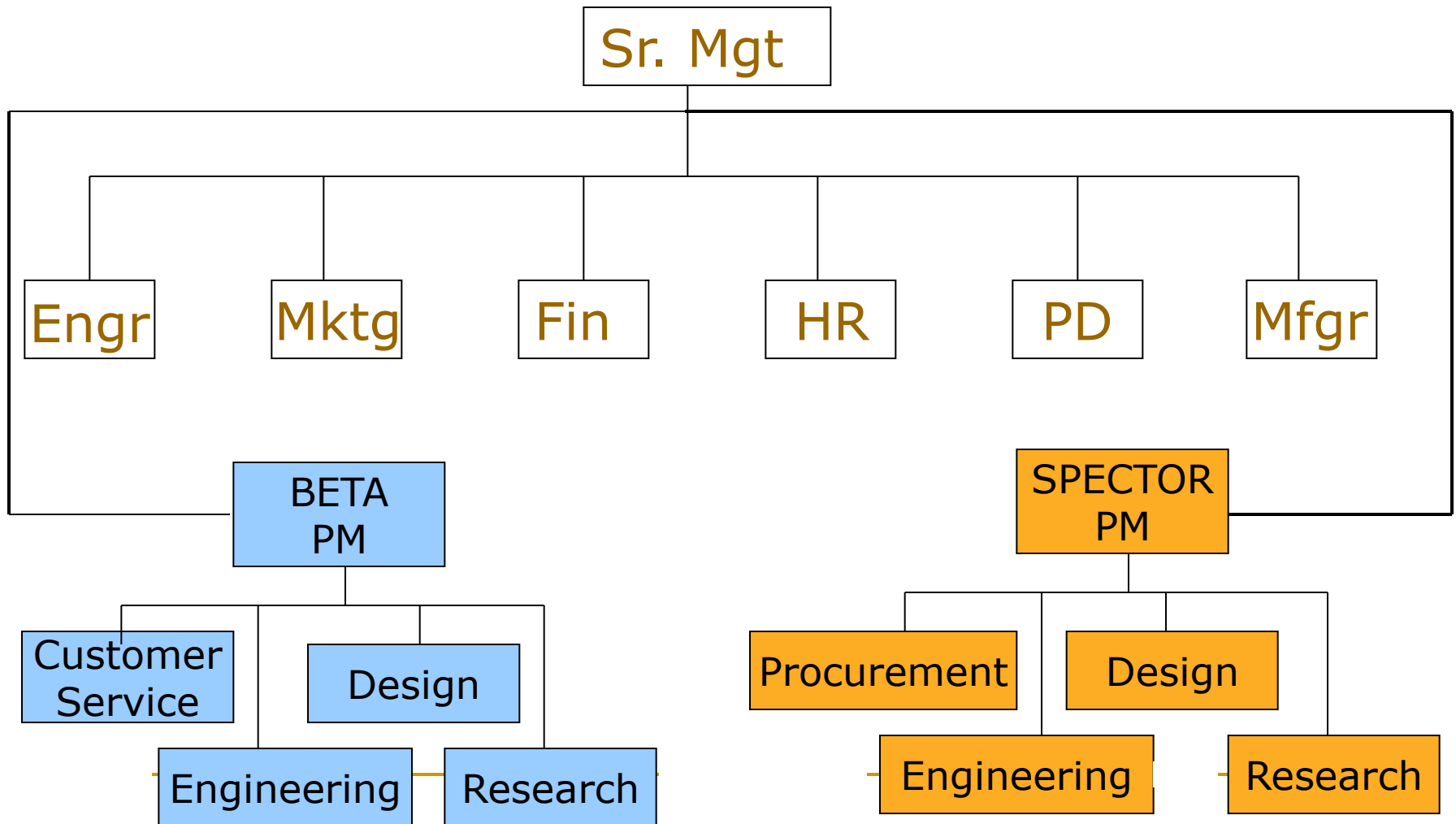
Pure Project & Pure Project "Arms"

- Suitable when

  - Project has high strategic importance

  - Project is large

 - Project has long duration

Pure Project & Pure Project "Arms"

- Pros
  - Project manager has high authority
  - Work of team is entirely devoted to the project
  - Necessary resources are procured/made available
  - Motivation, focus and team spirit

Pure Project & Pure Project "Arms" (cont'd)

- Cons
  - Costly duplication of effort in multi-project organizations
  - Lack of inter-project knowledge sharing
  - Personnel gain experience of one project only
  - Development of competencies neglected (subcontract specialized work)
  - Hiring/layoff cycle: low morale, high expense
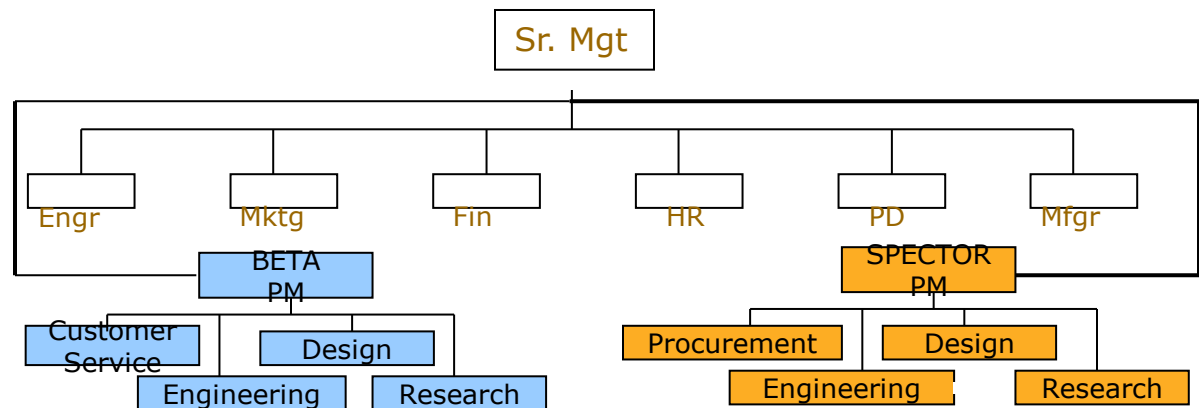
The Problem of Integration

- In the traditional organization: lack of integration between functions

- In projectized structures: lack of integration between projects (On its own, the projectized structure creates "project silos")

The focus should be:

The mission of the entire organization

Ways to Achieve Integration

Alternatives:

- The CEO integrates

- Informal structures

- Individuals with integrative role (system eng.)

- Task forces & permanent teams /committees

- Matrix

Achieving Integration: The Matrix

Both functional and projectized structures have specific advantages (and disadvantages)

Why not exploit the advantages of both?

Matrix Structure

A design to enable a dual focus:
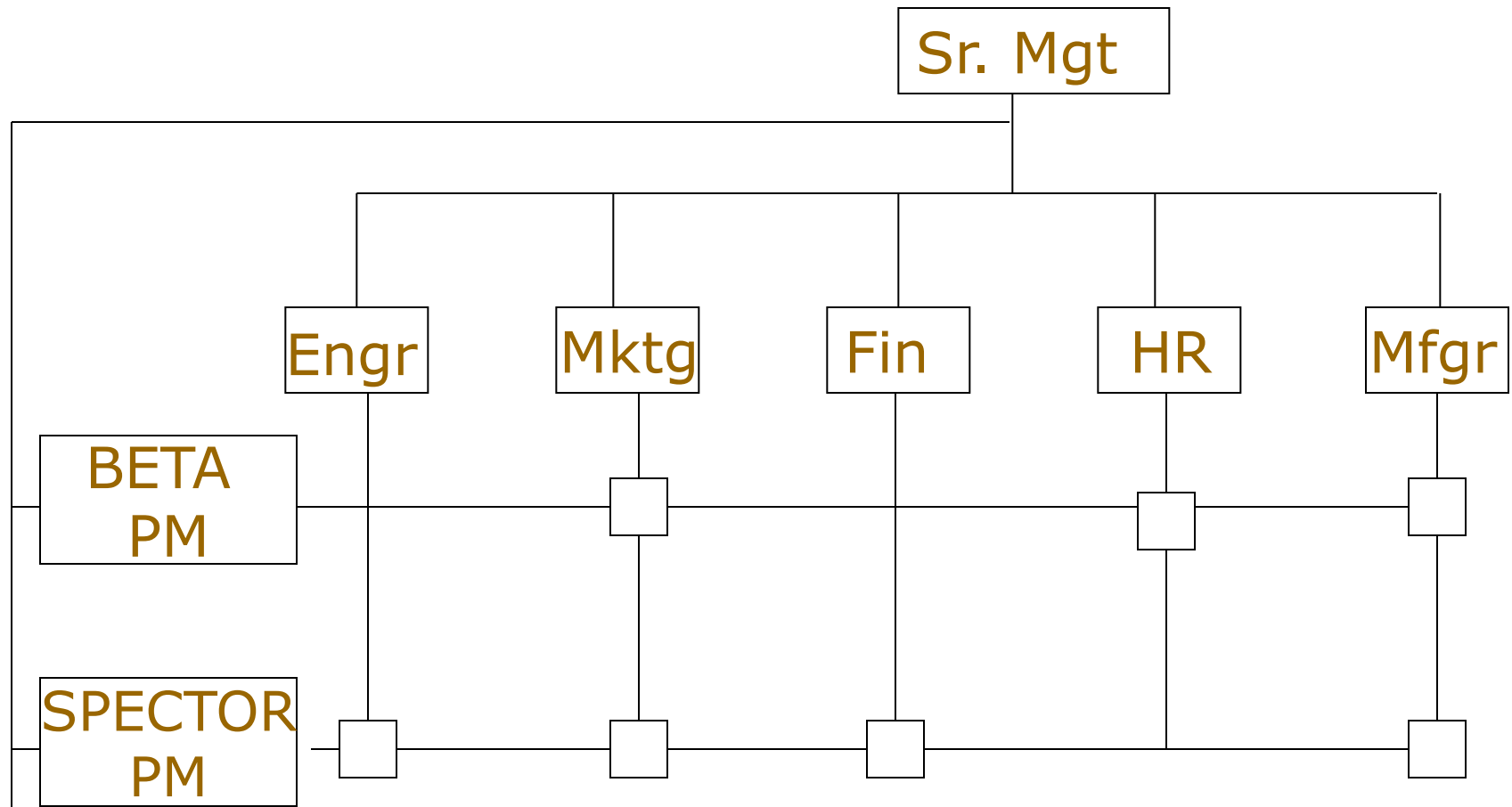

Focus on specific functions

Plus

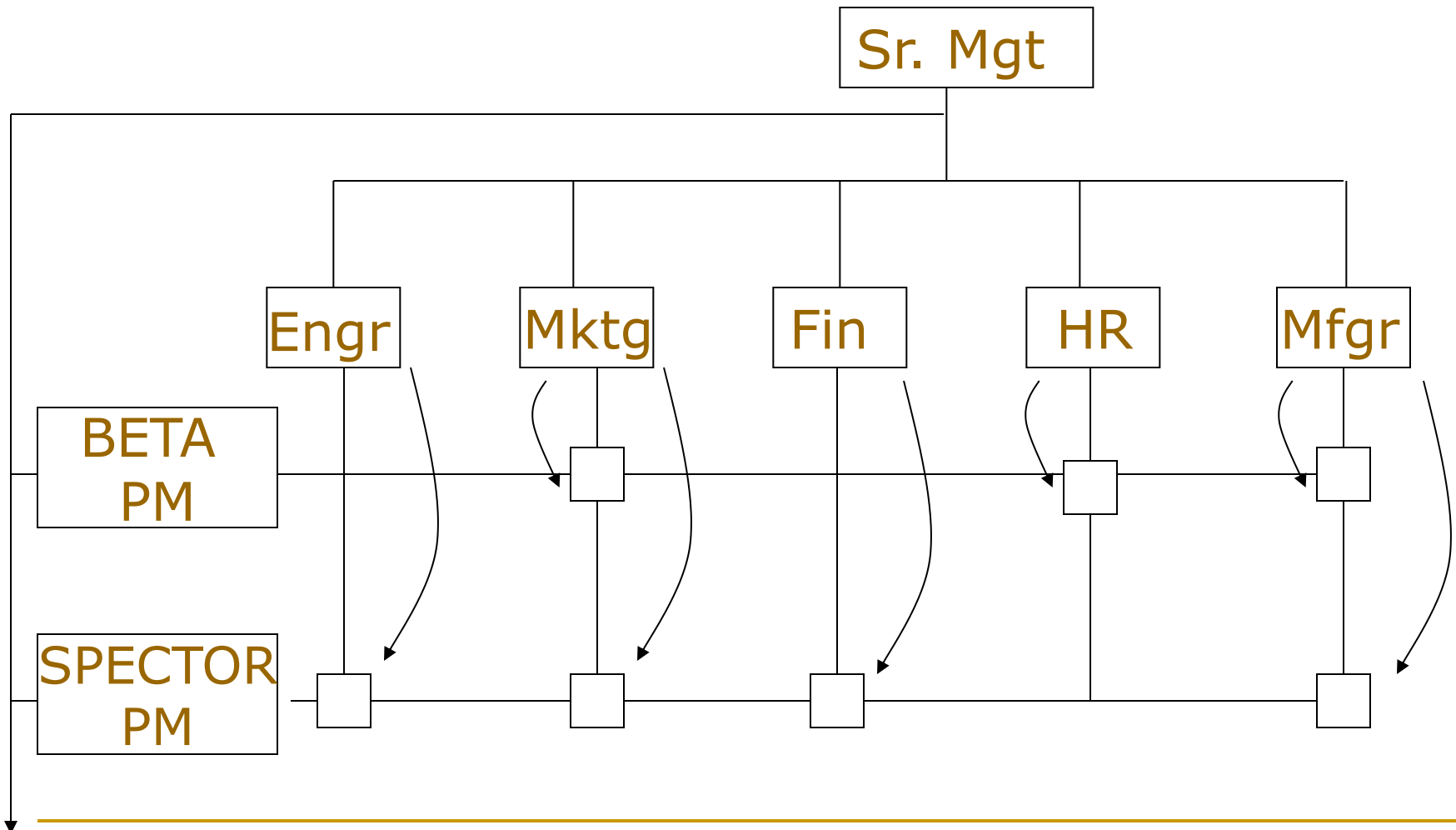Focus on projects

Matrix Structure

Superimposed structures

For simultaneous focus:

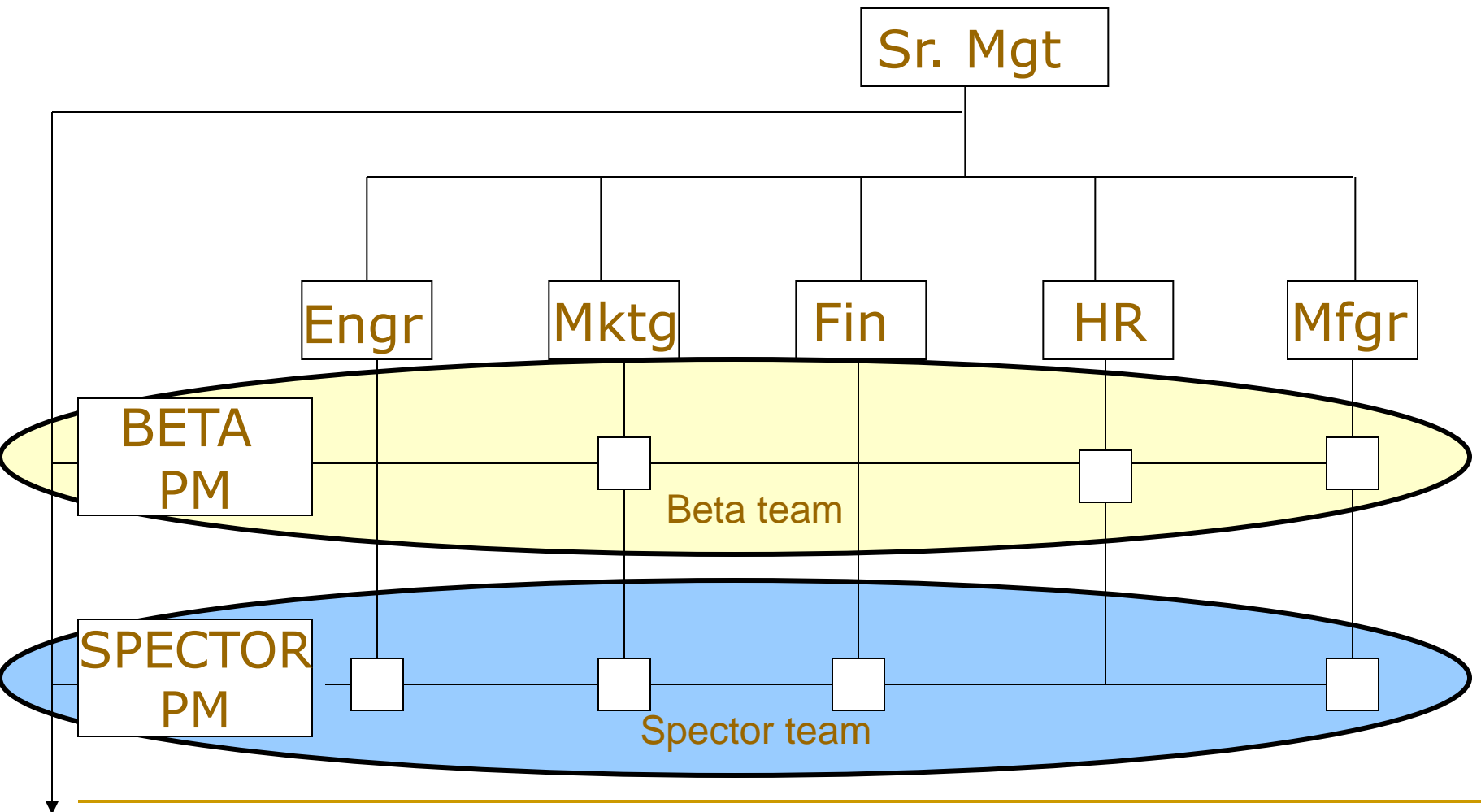Differentiation / specialization (Functions)

&

Projects

Matrix

Matrix

Matrix

Sr. Mgt

Engr   Mktg   Fin   HR   Mfgr

BETA
PM

Beta team

SPECTOR
PM

Spector team
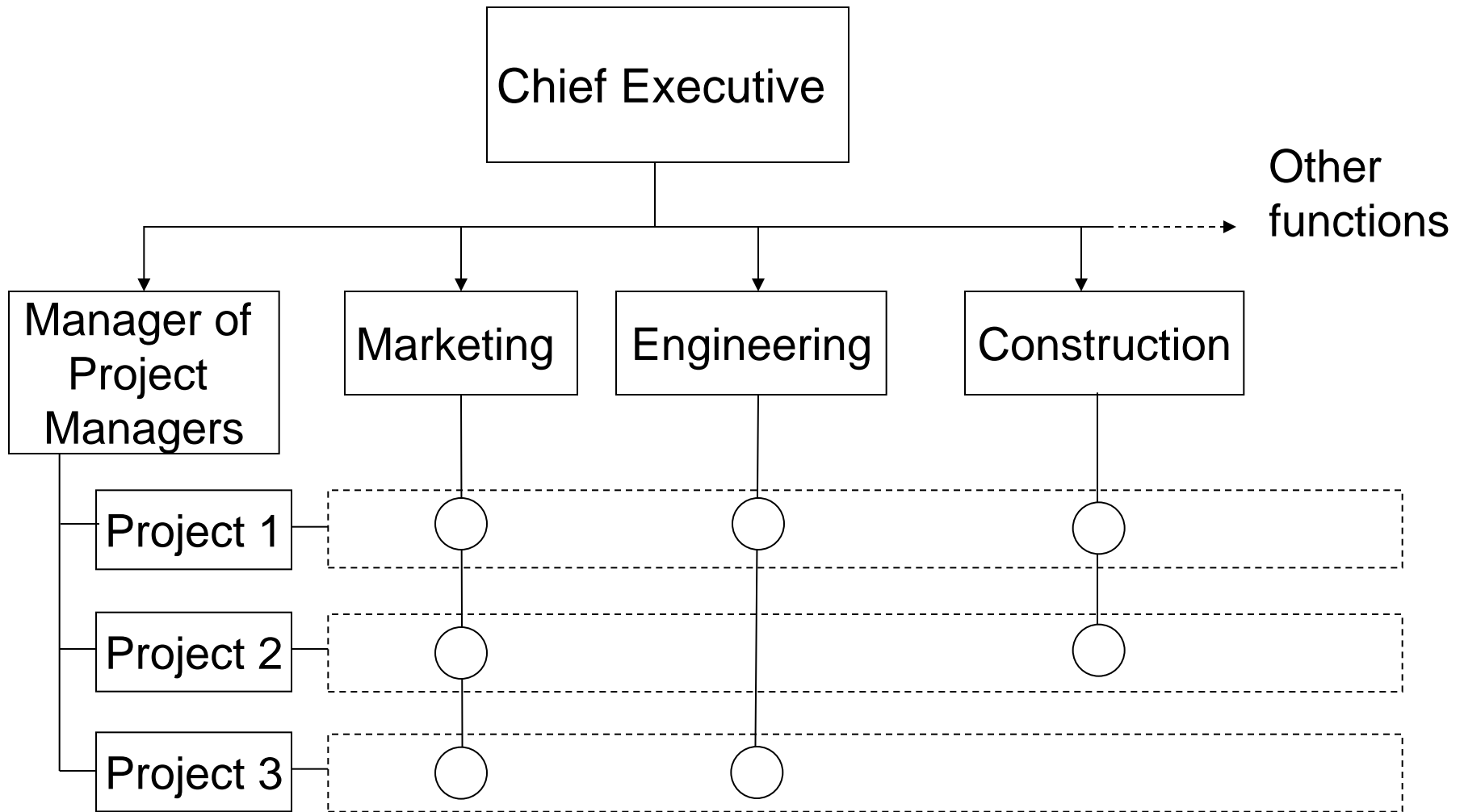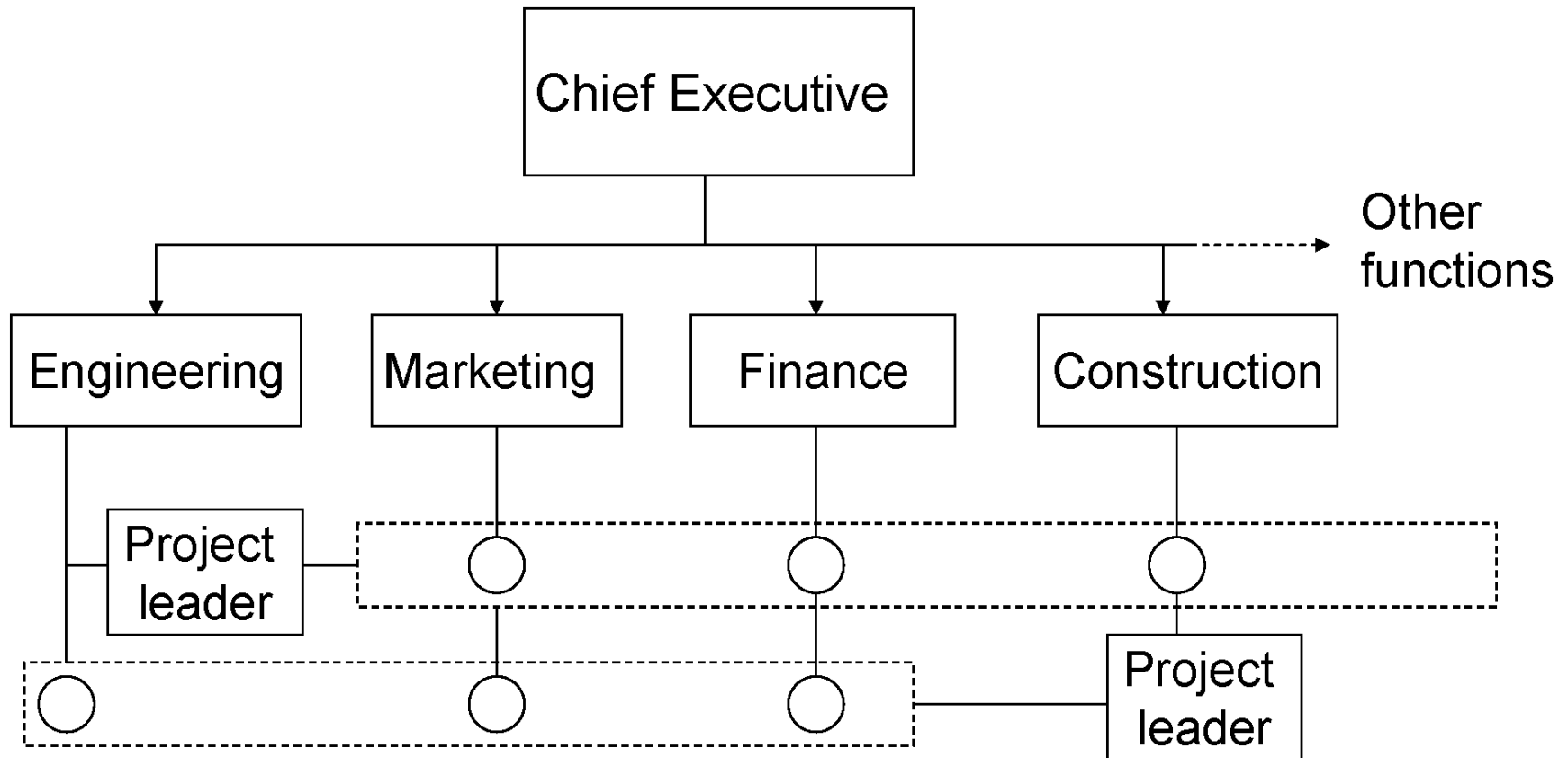
Matrix Structures and Power

Strong matrix: More power to project

Balanced matrix: Balance of power

Weak matrix: More power to functional

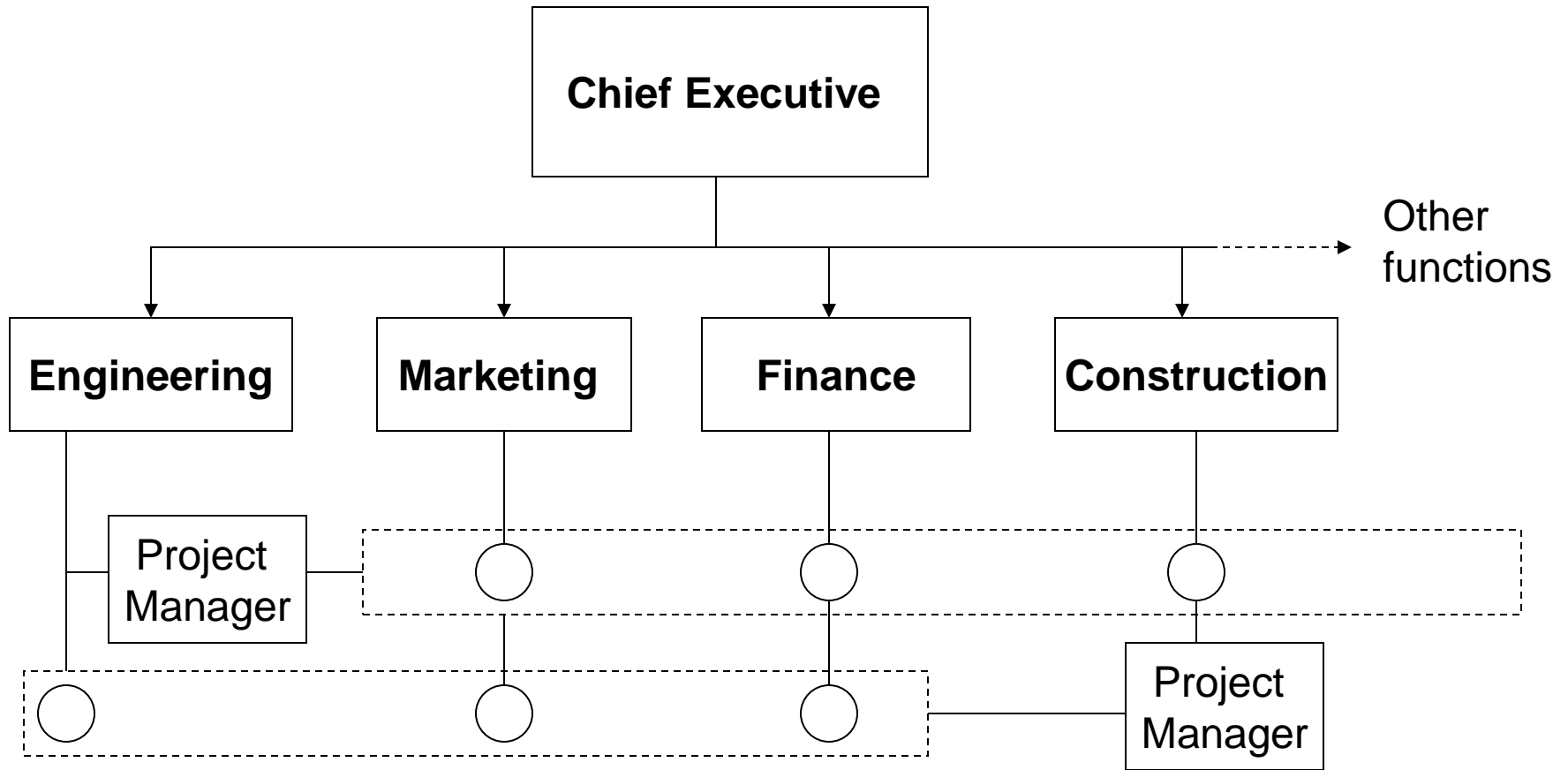# A Strong Matrix Structure

Chief Executive

Other functions

Manager of Project Managers

Marketing

Engineering

Construction

Project 1

Project 2

Project 3

A Weak Matrix Structure

Project Leader is a part-time position

H Steyn (Ed) Project Management – a Multidisciplinary Approach

A Balanced Matrix Structure

Project Manager is a full-time position

Matrix, Pros

✓ Emphasis on the bigger picture

✓ Focus on functional specialization as well as on projects

✓ Synergies within each function are exploited

✓ Synergies between projects are exploited

✓ Often used in complex, interdependent & changing situations
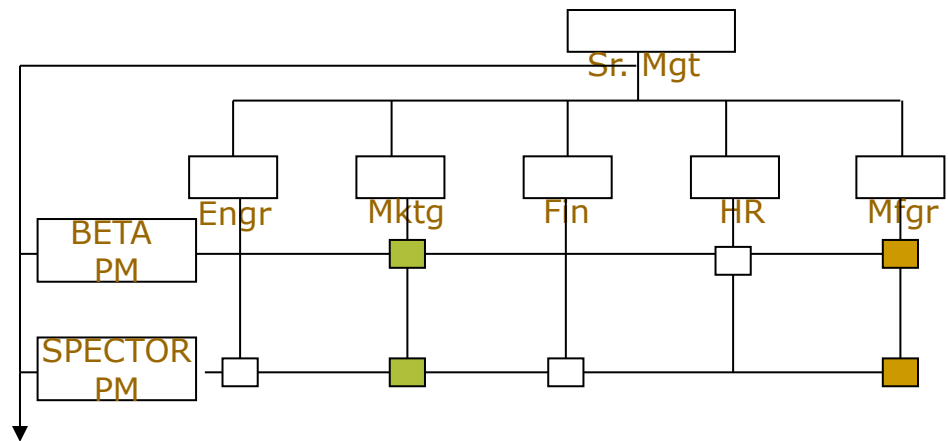
✓ Enriched information processing

Matrix, Pros (cont'd)

- Functional areas serve as resource repository

- Each project has dedicated PM

- Necessary resources are procured/made available
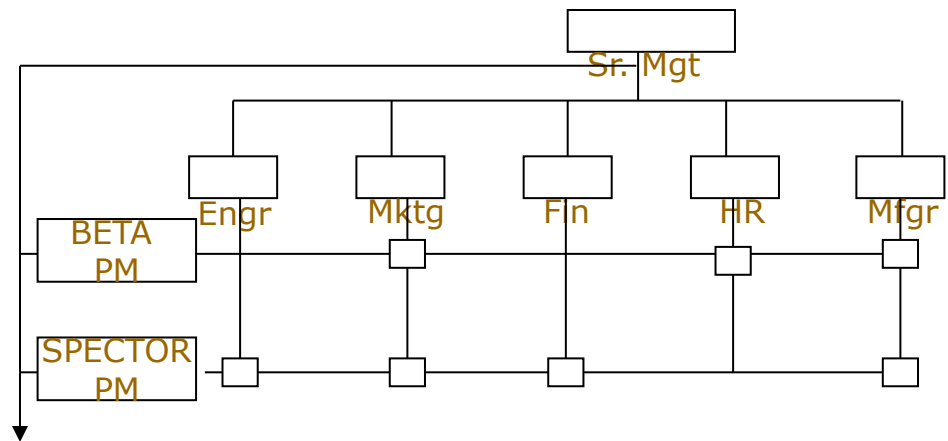
Matrix, Pros (cont'd)

- Personnel have a functional "home"—a "place to go";
  - inter-project knowledge sharing
  - people work on multiple projects but associate with people on other projects
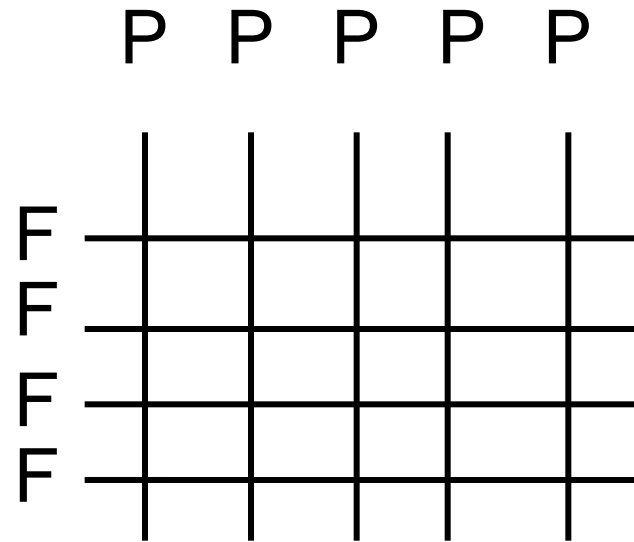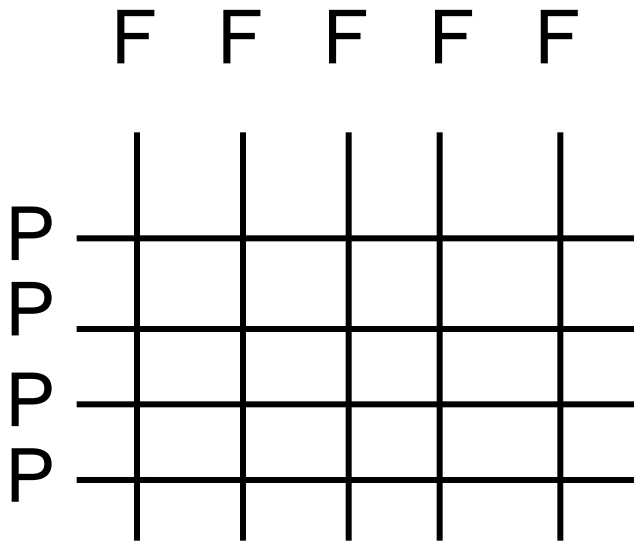
Matrix, Cons

Power struggles

(between functional and project structures)

Who has more power?

F   F   F   F   F   P   P   P   P   P

P   F

P   F

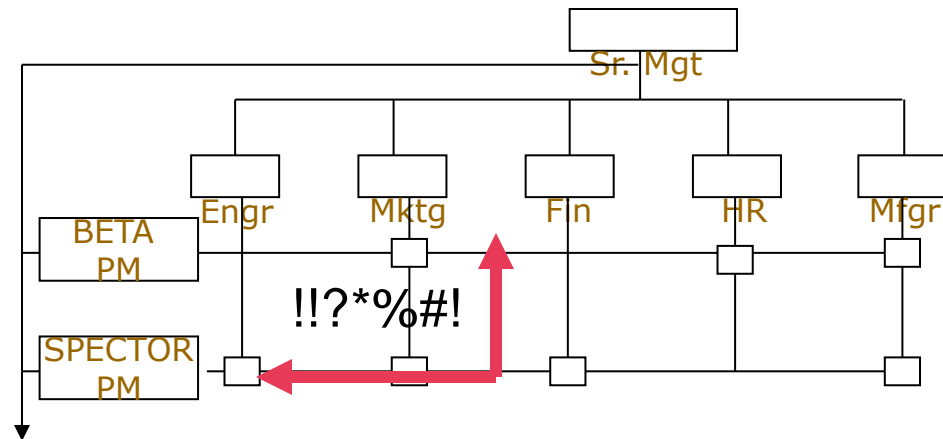P   F

P   F

In a strong matrix the role of functional managers is reduced, especially if the manager of PMs control funds

Matrix, Cons (cont'd)

Power struggles

(between functional and project structures)

Conflicts about resources:

- between PM and functional managers
- between managers of different projects

Matrix, Cons (cont'd)

- The multi-boss situation

- Unclear responsibilities and accountabilities

- The 2-hat problem

- Requires new *roles* and new ways of thinking

- Implementing is problematic & often involves resistance to change

Matrix, Cons (con'td)

- Role conflict of personnel working multiple projects:

  - Confusion over priorities: how to determine priorities in resource allocation?

  - Requires horizontal/vertical accounting and information processing *systems*; most organizations have only vertical

Matrix – more than a structure

A focus on processes & systems

$$\text{Matrix Organization} = \text{Matrix Structure} + \boxed{\text{Matrix Systems}} + \boxed{\text{Matrix Culture} + \text{Matrix Behavior}}$$

Davis & Lawrence

S*ystems* to support a matrix

Matrix – more than a structure - Systems

Matrix Organization = Matrix Structure + **Matrix Systems** + Matrix Culture + Matrix Behavior

Systems facilitate collaboration towards common goals

- Information systems of functional structure

- Information systems of project structures

- Systems to reach agreements regarding resource allocation

Matrix – more than a structure – Culture & Behavior

Matrix Organization = Matrix Structure + Matrix Systems + Matrix Culture + Matrix Behavior

All the world's a stage,
And all the men and women
merely players

William Shakespeare
As You Like It

It's about roles

Roles in a Matrix

Built-in conflicts:

The role of people in the functional structure

vs.

The role of the people in the integrating structure

Different jobs, *but* with common goals

Constructive conflict

Roles in a Matrix

Depend on *relationships*

Roles in a Matrix

The formal structure is *not* the only determinant of roles & influence

Project managers often have to make commitments without having positional power

It's a different paradigm

Roles and Power in a Matrix

Structure: Positional power (legitimate power): can give rewards and can coerce

- ✓ ***Personal power:***
  - ✓ Expert power (knowledge, judgment, experience)
  - ✓ Referent power (*relationships*)
  - ✓ Rational persuasion
  - ✓ Team power

Roles in a Matrix
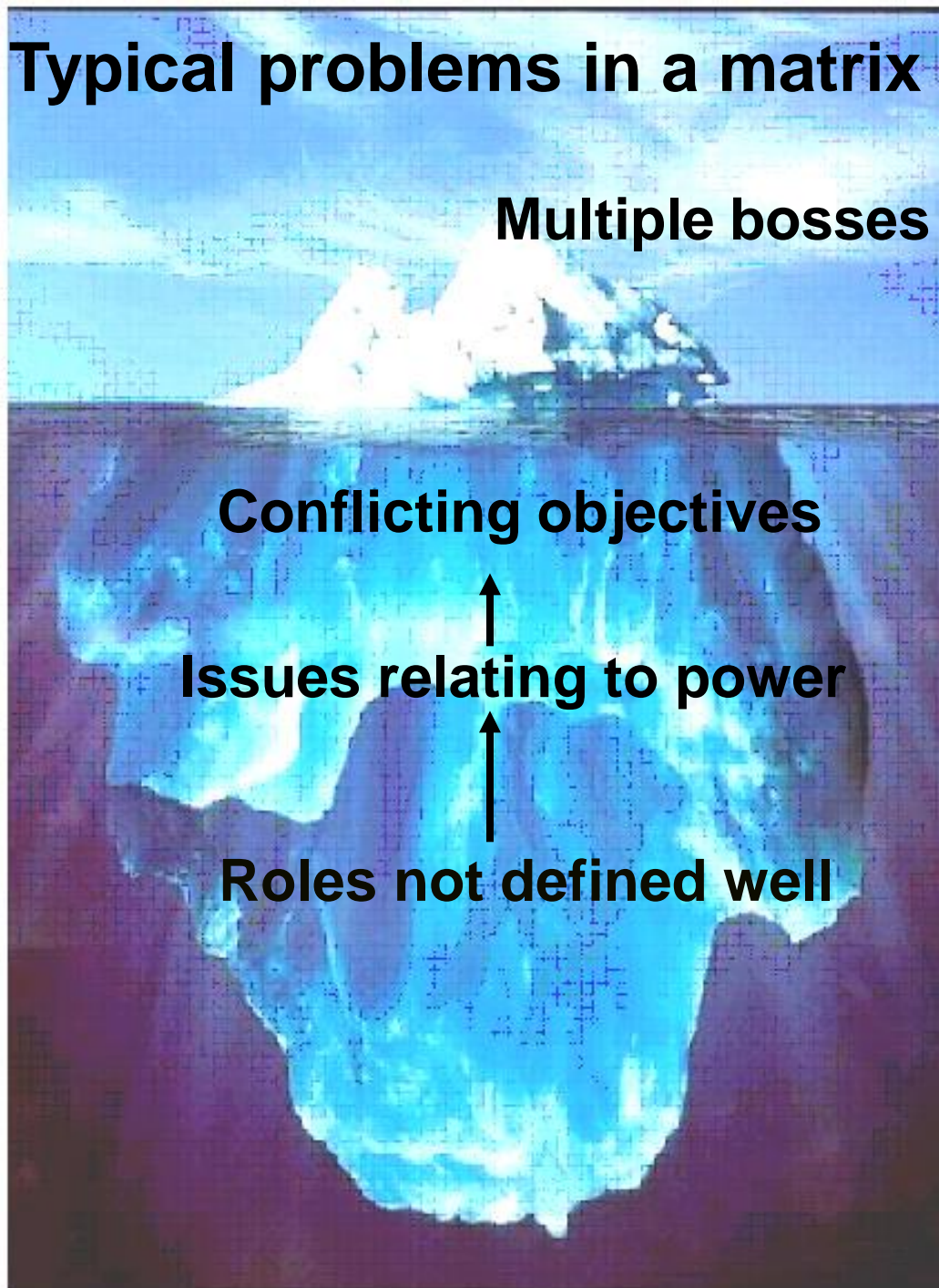
It's not only a structure,

It's also a frame of mind.
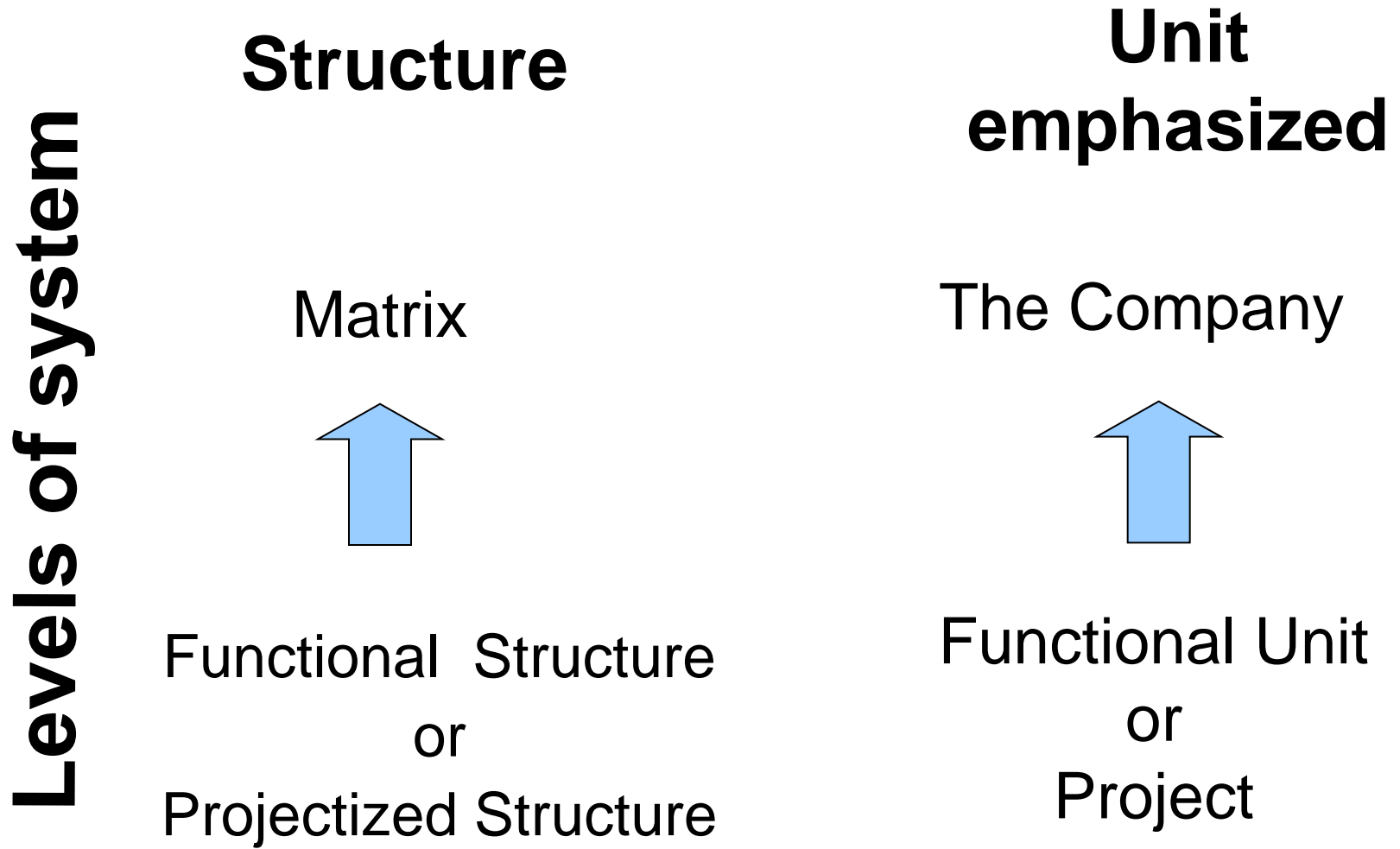
Roles in a Matrix

Well-defined roles reduce issues relating to power

Clarifying roles contributes to finding solutions to conflicting objectives (and to focus on common goals)

Roles in a Matrix – a Practical Tool Responsibility matrix (Chapter 5)

Culture & Behavior in a Matrix

- More collaborative / team effort

- Focus on common goals / corporate strategy

- More negotiation (selling rather than telling)

- More communication – lateral, vertical and joint

- Communication sometimes less formal

- Less emphasis on a bureaucratic (paternalistic) hierarchy than with traditional hierarchy

- More reliant on interpersonal relations

Matrix: Conclusion – the bigger picture

Levels of system

Structure

Unit emphasized

Matrix

The Company

Functional Structure
or
Projectized Structure

Functional Unit
or
Project

Matrix: Conclusion

- A matrix is more than just a structure – a new way of doing, *supported by specific systems*

- Implementation does take time & effort

Any structure can be made to work

PMO Role in Pure Project and Matrix Organizations

- Assist PMs to determine resource requirements for each project

- Keep track of resources constraints

- Assign resources to projects based upon project priorities, resource requirements, and resource constraints Work with Project Review Board or Steering Committee to determine project priorities
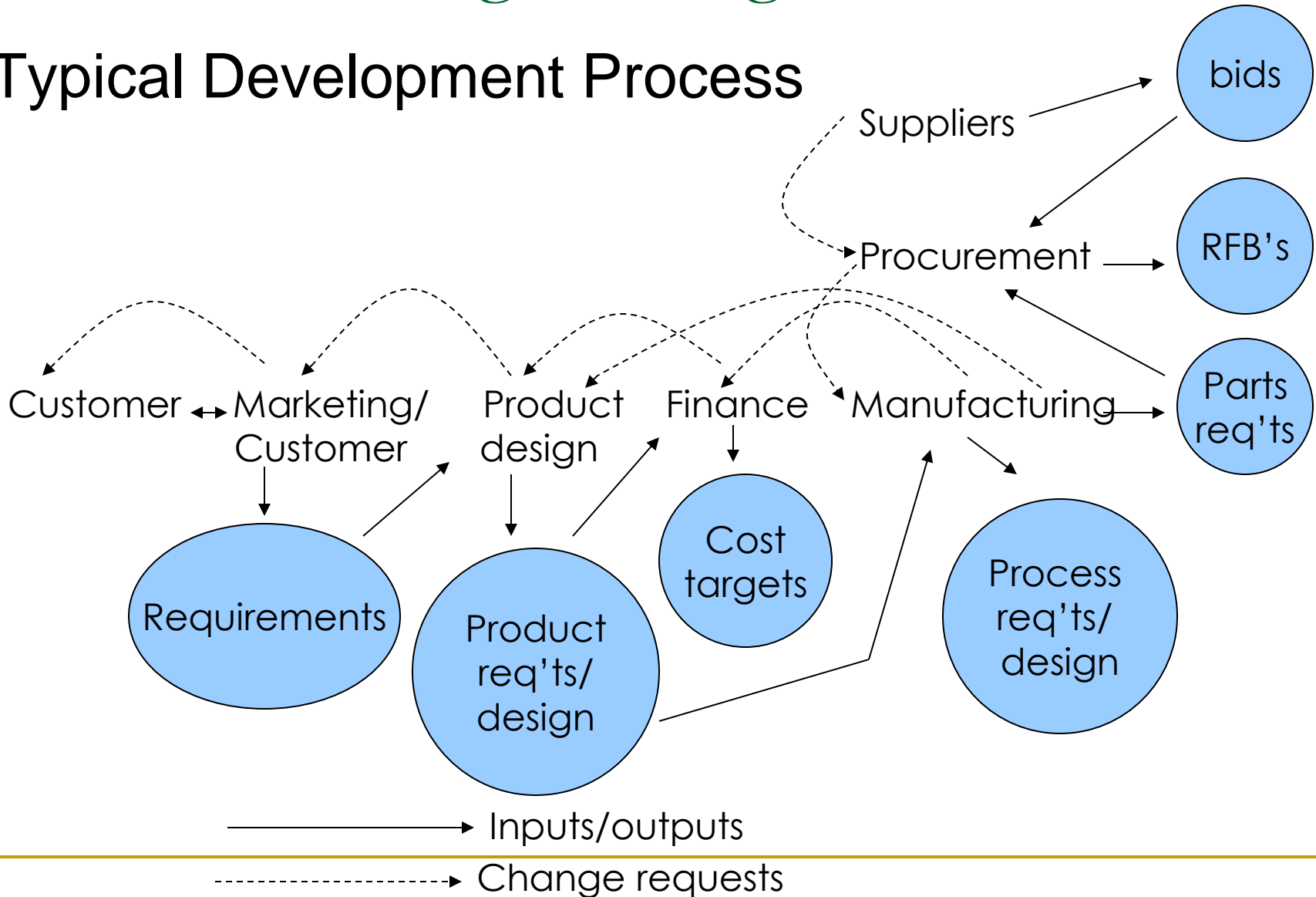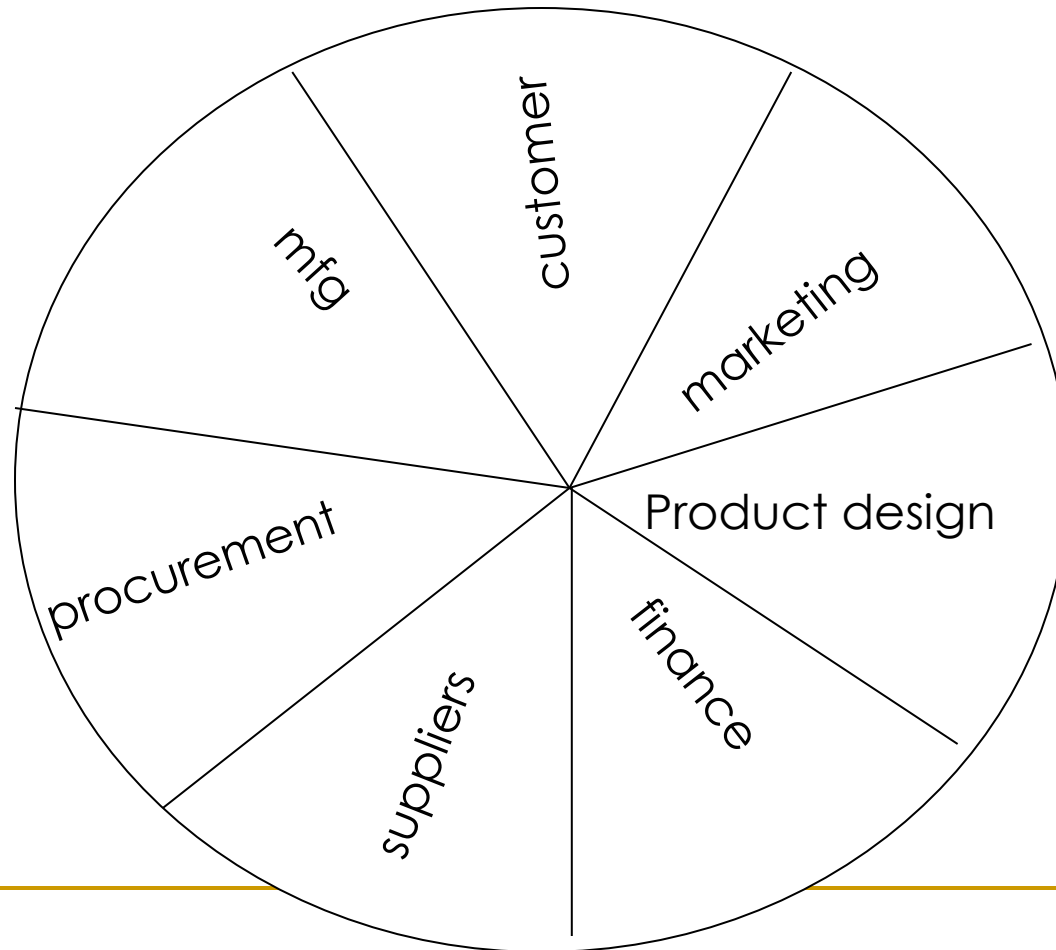
PMO and Pure Project "Arms"
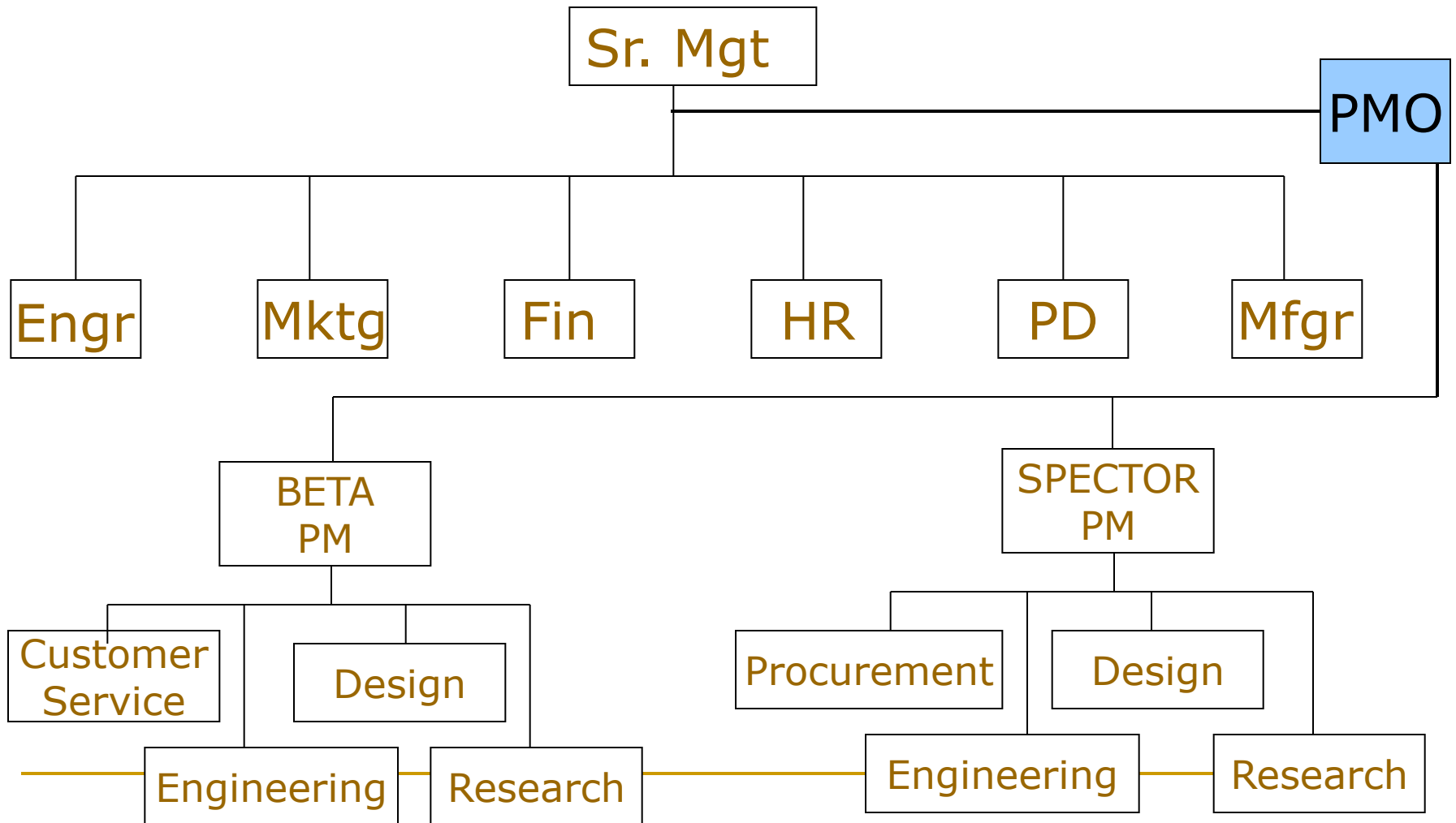
Matrix
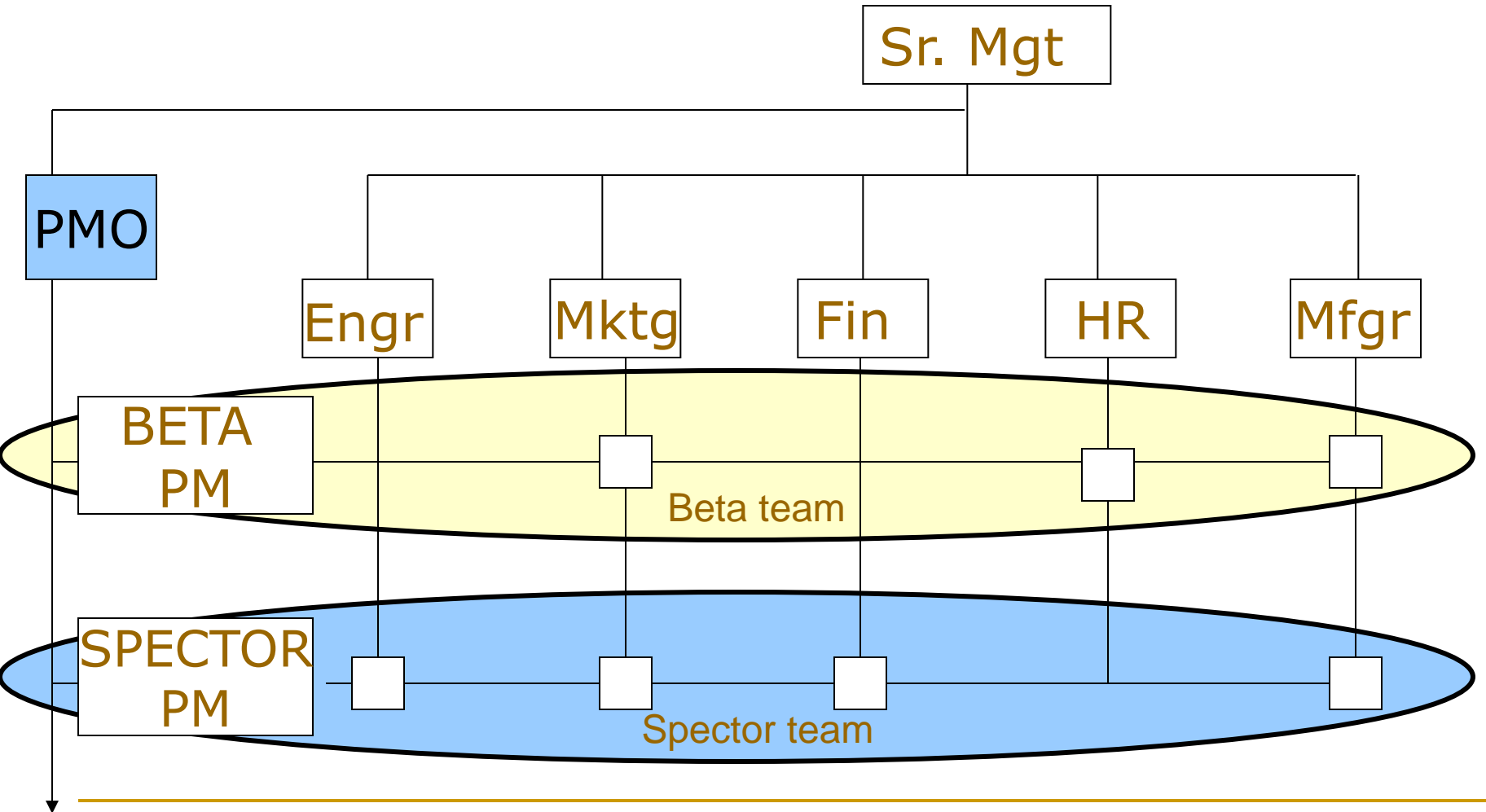
Concurrent Engineering

- ## Typical Development Process

Concurrent Engineering (cont'd)

- Team approach

Concurrent Engineering/Integrated Product Development Teams

- For large projects/programs, three levels

- Program Management Team (PMT): oversight, planning, resource allocation

- Technical Teams (TT): one for each major system or assembly

  - Consistency among Design/Build Teams, DTB's

- Design-build Teams (DTB's)

  - One for each component, subsystem, or subassembly

Concurrent Engineering/Integrated Product Development Teams (cont'd)
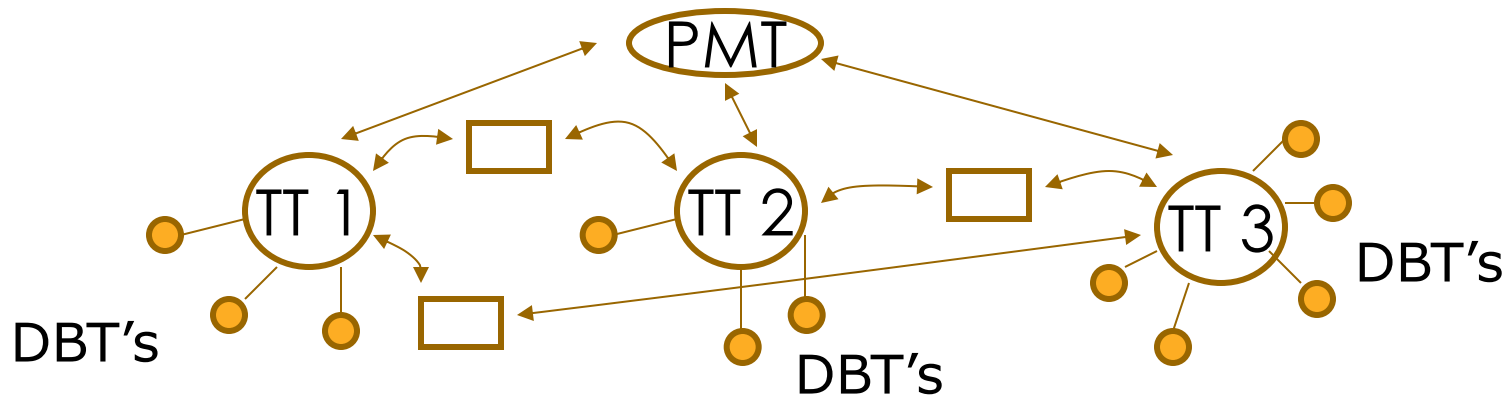
□ Integration Teams: integration among major systems and assemblies
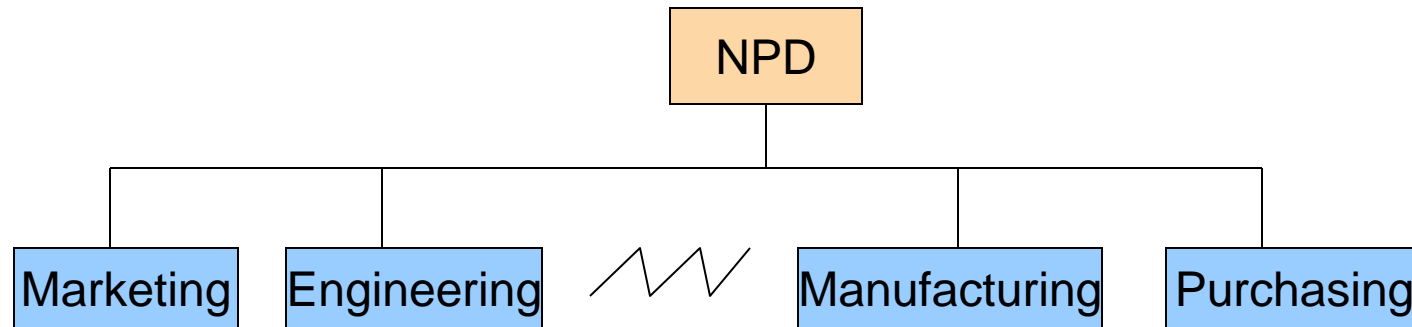
Choosing a Project Manager Pinhole Optics Case 14.2

- Functional managers serve as project manager
  - When project resides in one area
  - and requires little cross-functional cooperation

Pinhole Optics Case

- **Problems with FM serving as PM on cross-functional projects:**
  - Narrow perspective; bias toward own functional area

```
                    ┌─────────┐
                    │   NPD   │
                    └─────────┘
        ┌──────────┬──────────┬──────────┬──────────┐
   ┌──────────┐ ┌──────────┐  /\/\  ┌──────────────┐ ┌──────────┐
   │ Marketing│ │Engineering│       │ Manufacturing│ │Purchasing│
   └──────────┘ └──────────┘        └──────────────┘ └──────────┘
```

  - Insufficient "domain competency"
  - Lack of time (department gets priority over projects)
  - Lack of cooperation from other managers

Pinhole Optics Case

- **Where to get PM?**
  - Hire outsider with experience in NPD and industry knowledge
  - "Groom" PMs internally