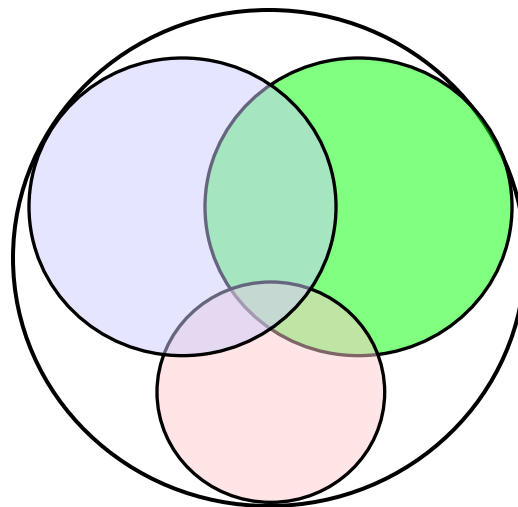


# Visualization of Systems Management:

## Session 3

# Integrating Systems Engineering and Project Management



# Objectives

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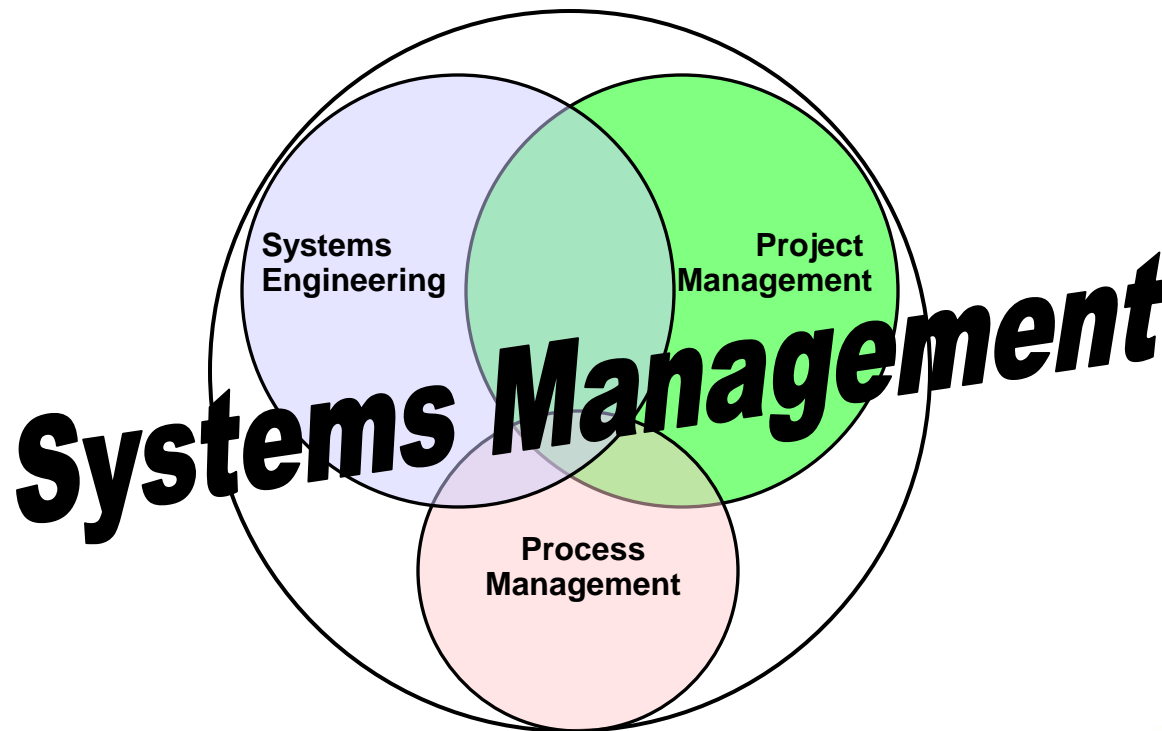
Upon mastering this session you will be able to:

- Provide an overview of *the fundamentals of system engineering and project management* as the keys to:
  - effective team integration,
  - cost and schedule management, and
  - customer satisfaction
- Discuss the development philosophy and the need for *process* in the development environment
- Implement best practices

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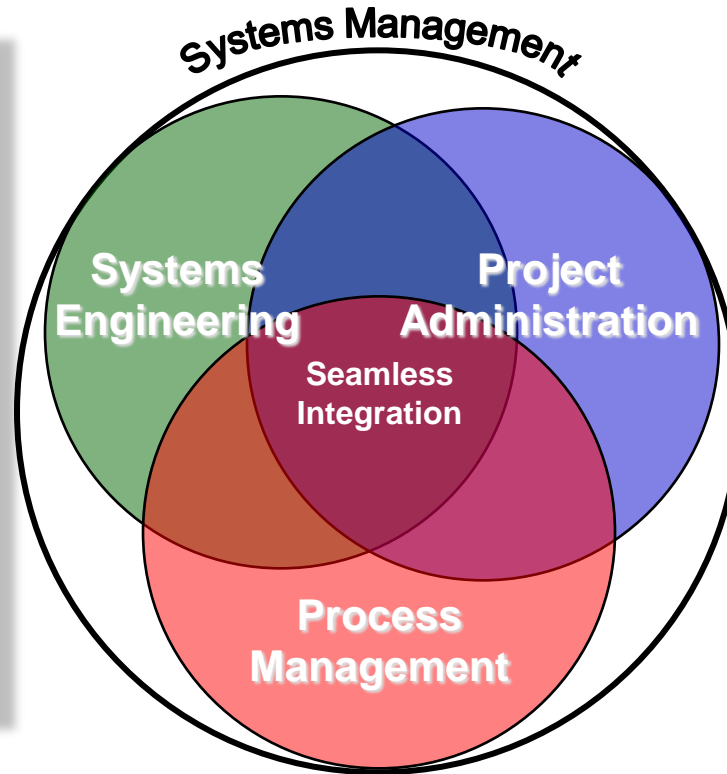
# The Case for Systems Management

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# Systems Management Content

- Requirements
- Constraints
- Science Trades
- Technology Trades
- Concept
- Architecture
- Margins
- Qualification
- Verification
- Validation
- etc.



- Customers
- Stakeholders
- Business Issues
- Budget
- Schedule
- Contracts
- Legal
- Alliances
- Personnel
- etc.

**Requirements Elaboration, Requirements Traceability, Baseline Management, Change Control, Work Release, Earned Value, CMMI, Six Sigma, UML, SysML etc.**

# Success and Failure for Recent Major Systems

*Iridium* – Perfect technical execution

**Business failure**

Six billion dollars invested

Sold for \$25 million (0.4 % recovery of \$ invested)

***Team ignored rapidly changing business case***

*Globalstar* – Perfect technical execution

**Business failure**

Four billion dollars invested

Now in bankruptcy

***Team ignored rapidly changing business case***

*Øresund Bridge-Tunnel* – Between Copenhagen & Malmö

Perfect technical execution

**Still a business success after 9 years in operation**

Finished on budget (set 6 years before)

Finished 10-year project 2 months early

***Team managed to the business case***

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# **System Management Concepts**

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# **So Exactly What is Systems Management?**

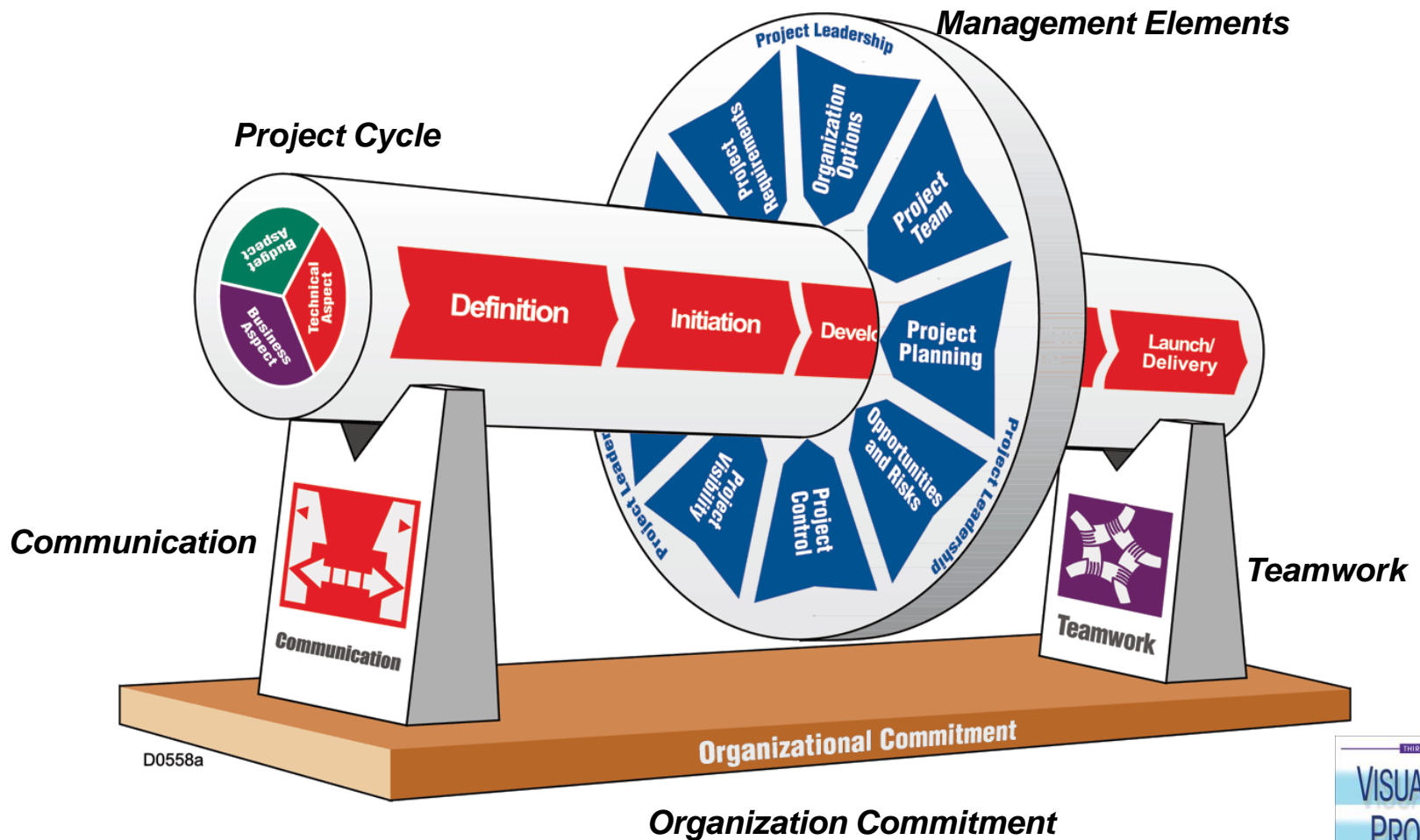
## **Systems Management Rules of Conduct**

- **The three aspects of the project cycle (business, budget, technical) must be and remain congruent.**
- **The project's business case must be flowed down along with the technical requirements to all levels of decomposition.**
- **All decision gates and design reviews -- although heavy in technical content -- are business driven.**
- **All decision gates must answer two questions:**
  - **Are we building the right solution (in-process validation)?**
  - **Are we building the solution right (it meets requirements)?**

**It takes collaboration and teamwork  
to make this effective.**

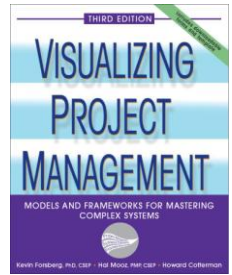
# Systems Management Process Model

## The Five Essentials



D0558a

Ref: VPM p 24



# **The First Essential**

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## **Organizational Commitment – A Perpetual Essential**



***The decisions and actions of management that support and facilitate the adoption of the process***

- Oral and written commitment
- Planning systems
- Cost collection systems
- Status reporting systems
- Career path systems
- Remuneration systems
- Planning tools
- Requirements tools
- Simulation tools
- Decision support systems
- Training
- Mentoring

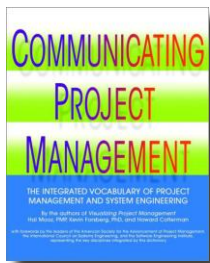
# The Second Essential

## Communication – A Perpetual Essential



*The communication methods, words, jargon, and symbols used and understood by all participants working on a project*

*Tailored for the project environment*



*An initial baseline:*  
**Communicating Project Management**  
Mooz, Forsberg, Cotterman  
John Wiley & Sons, 2002

Also Ref: VPM pp 26, 48 - 68



Is this formal?

# Communication Example

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- **SCENE:** Three old men walking down a beach:
- **First man:** “It is windy today!”
- **Second man (Cupping his ear):** “No! It is Thursday.”
- **Third man (Also cupping his ear):** “ Yeah! So am I. Let’s get a beer.”

# **Vocabulary - First Principles**

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- **All system stakeholders benefit from a common vocabulary because it allows effective communication.**
- **Common project management vocabularies have to be caused**
  - **They do not happen by themselves**
- **Disconnects between words and actions will cause words to be redefined.**
- **Find ways to share the system management vocabulary with your customers – internal *and* external.**

# Vocabulary - Best Practice

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## Creating a Common Vocabulary

Best Practices	Your Organization	Extent of Application in Industry
A glossary of project management terms exists.		Wide-spread
That glossary is available to all stakeholders including customers.		Limited, but essential to ensure communication.
All management and team actions are in concert with the meaning of the definitions.		Wide-spread

# **Suggestions for a Common Vocabulary**

- **Do not assume all parties have a common understanding of project terms.**
- **In discussions, ask for clarifying/confirming feedback.**
- **In written communications, include definitions for specialized terms.**
- **Publish a project acronym and definition of terms listing – include in the Project Plan.**
- **Post acronyms/definitions in the team’s physical or on-line Information Center or other high traffic area.**
- **Make sure Stakeholders get a copy of the vocabulary listing (and, ideally, participate in its preparation).**

# The Third Essential



## Teamwork – A Perpetual Essential



*Concurrent, timely involvement of users, customers, producers, suppliers, operators, and maintenance stakeholders*

Cats

A group (two or more people) working together with:

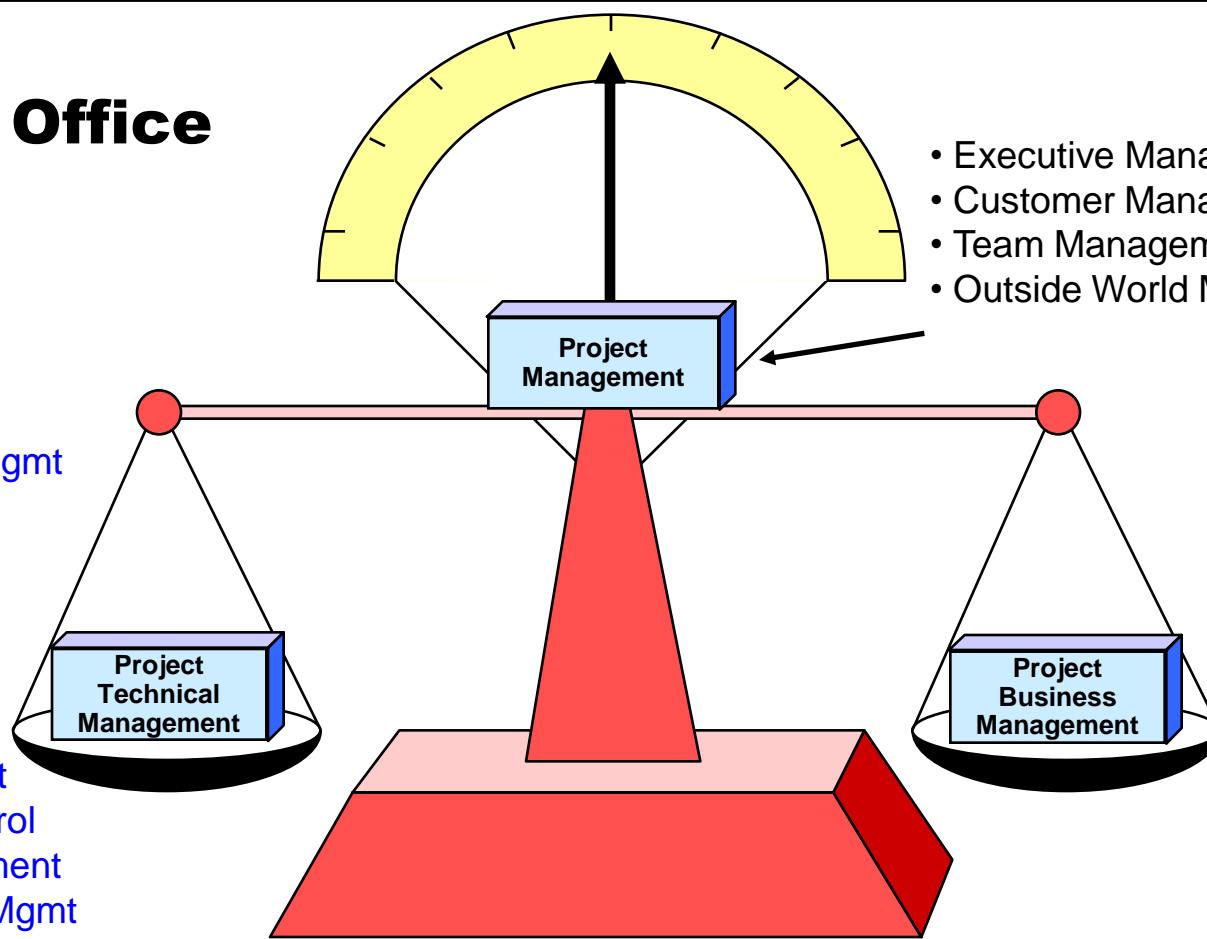
- A common goal
- Acknowledged interdependency and trust
- Acceptance of a common code of conduct
- A shared reward

**Energized by Team Spirit**

Ref: VPM pp 27, 69-83

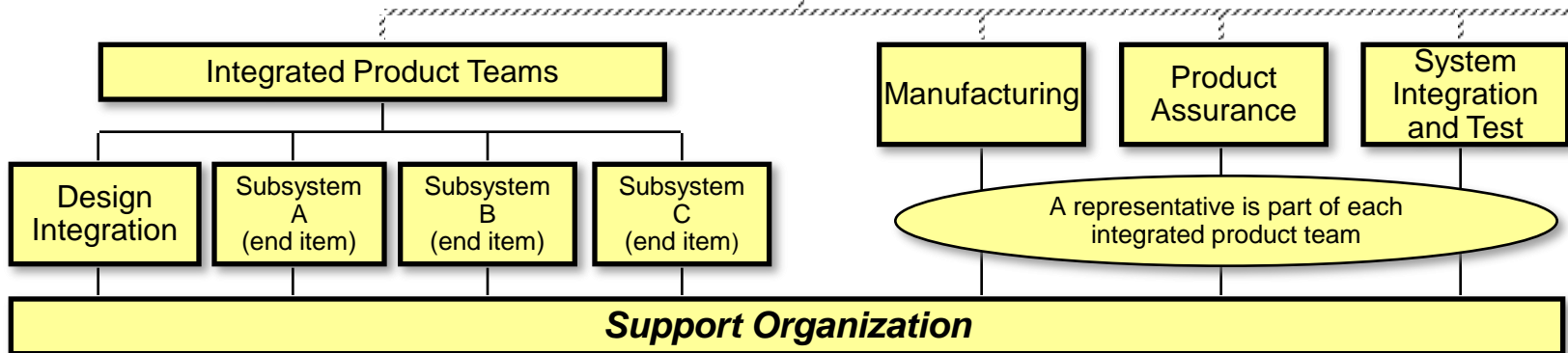
# Project Office Triad

- Systems Engineering Mgmt
- Requirements Management
- Requirements Analysis
- Requirements Audit
- Baseline Mgmt
- Interface Control
- Risk Management
- Performance Mgmt

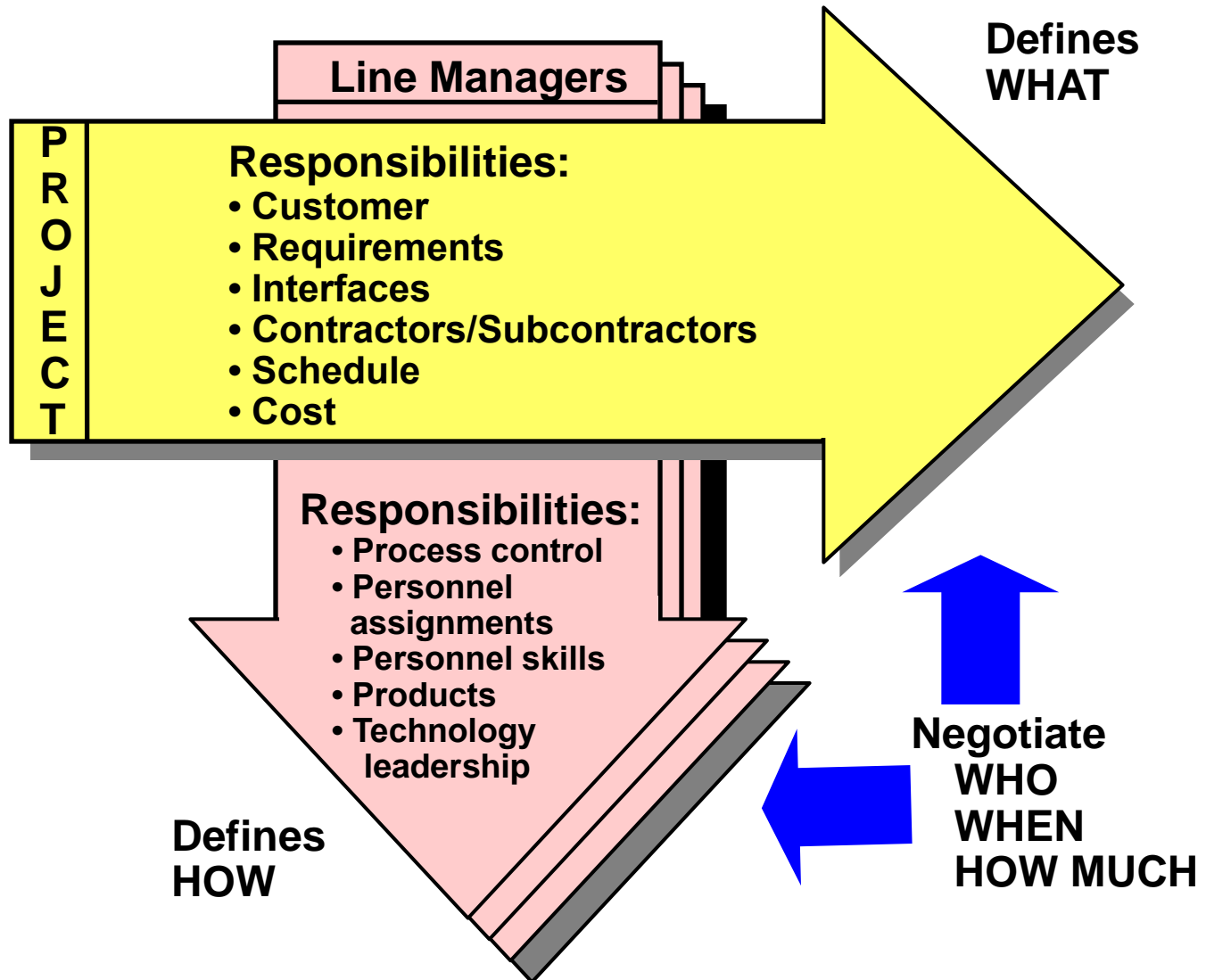


- Executive Management
- Customer Management
- Team Management
- Outside World Management

- Planning
- Cost Mgmt
- Schedule Mgmt
- Contracts Mgmt
- Data Mgmt
- Configuration Management
- Subcontractor Management
- Administrative Management
- Security



# Matrix Functions



# **Suggestions for Teamwork**

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- **Set and communicate a strategic vision**
- **Use joint training and a project cycle to create a common set of expectations**
- **Ensure clear definition of leadership roles as they change over the course of the project, to avoid confusion in responsibilities**
- **Create team rewards**
- **Ensure roles and responsibilities are understood for the various type of projects**

# End of Session

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