



## The Project Academy Series:

# Project Requirements Definition & Management

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# Welcome and Introductions

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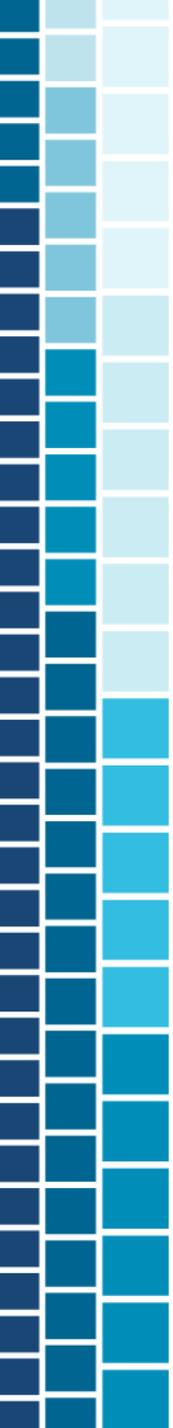
# Presentation Objectives

- **Help develop an understanding of:**
  - **How to develop and define Project requirements**
  - **What Requirements Management is all about**
    - **Specific emphasis on Requirements Traceability**
  - **Common problems and pitfalls encountered when developing and managing requirements**
  - **Impacts if Requirements Definition and Management is not done properly**



# Agenda

- Requirements Definition
  - What is Requirements Definition
  - Requirements Alignment, 3-levels
  - General Process Flow
  - Quality Requirements **Exercise/Break**
- Requirements Management
  - What is Requirements Management
  - Requirements Management Activities
  - Traceability **Exercise/Break**
- Common Problems and Pitfalls
- Impact if Not Done Right



# Requirements Definition



# What is Requirements Definition?

- The Set of Activities and Tasks that Identifies the Stakeholders, Elicitation techniques, and Collects, Analyzes, Documents, Approves, and Controls All of their requirements for a Project
  - Begins early, typically immediately after Project Concept/S1BA approval
  - Must be planned, scheduled, resourced, and managed to be successful
    - **THIS IS NOT AN AD HOC OR CASUAL EFFORT**
  - The results document the Project-level requirements, not just the RFP requirements

# Requirements Alignment, 3-levels

## ■ First: Project Scope

- “Scope: The sum of the products and services to be provided [by the] project
- All requirements must stem from the Project Scope

## ■ Second: Project Requirements

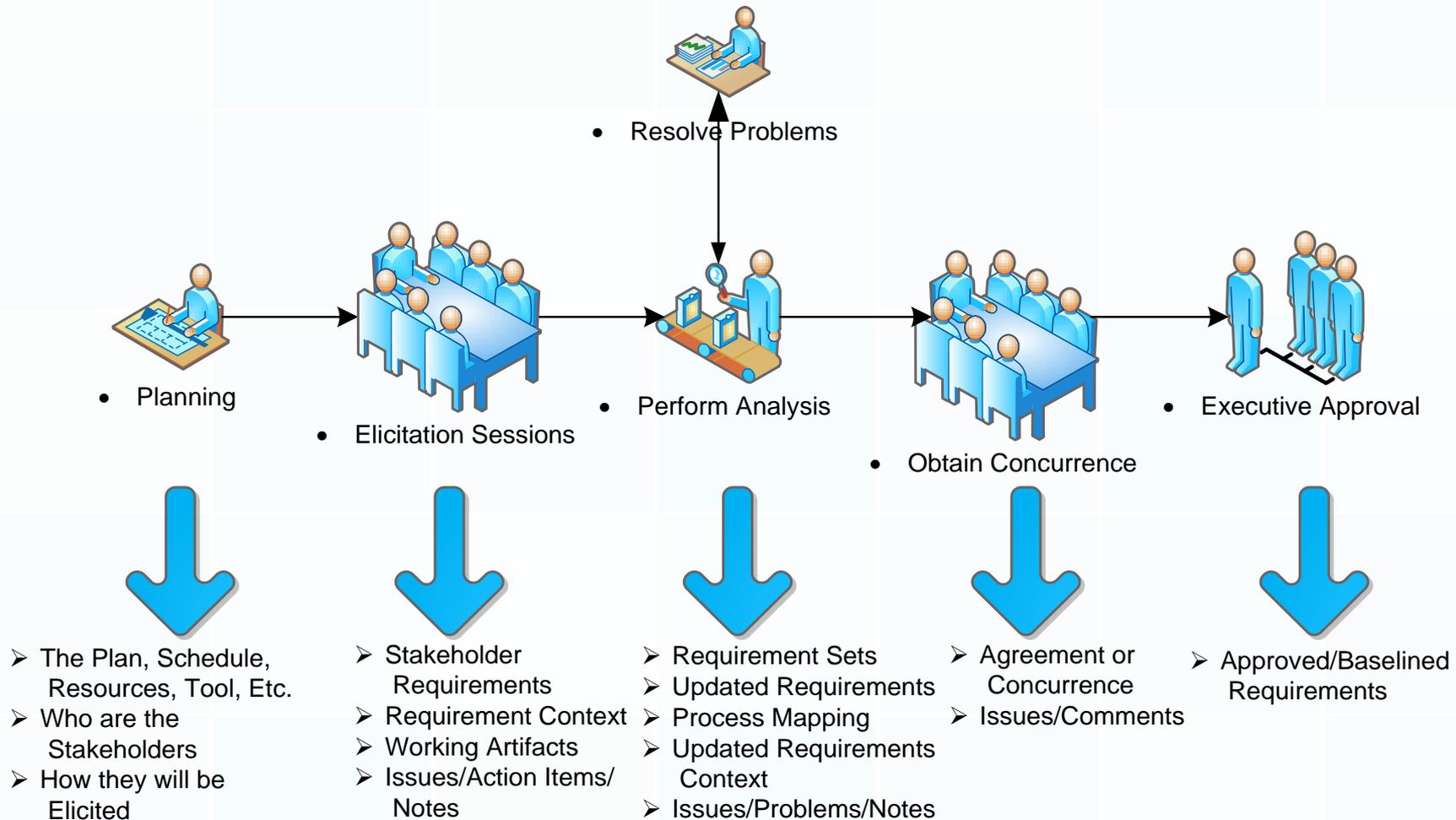
- Consist of mid and low level requirements
- Typically derived through a hierarchical decomposition process

## ■ Third: Allocate Requirements

- Assignment of Project Requirements to responsible entities



# General Process Flow



# General Process Flow

- **Key Predecessor for Performing Requirements Definition**
  - **Planning and scheduling of the activities and tasks**
  - **Identifying the resources, direct and indirect**
    - Identifying Project resources relatively easy but estimates must be made for Stakeholders supporting the effort
  - **Manage the effort**
    - Activity tracking, progress reporting, status updates, management and artifact reviews, etc. should be performed to ensure the effort stays on track
  - **This effort has a common tendency to slip and result in a poor requirements document**

# General Process Flow

## ■ Elicit Stakeholder Requirements

- All Stakeholders must be identified
- An elicitation approach must be determined for each Stakeholder and Stakeholder Class/Group
  - Best way to elicit requirement from one Stakeholder may NOT be the same as another Stakeholder
- Schedule and conduct elicitation sessions
  - Document requirements context with the requirements
  - Capture all documentation, word, pictures, flow charts, etc.
  - Capture commonly missed areas: constraints, M&O scenarios, usability, etc.
- Do NOT attempt to perform analysis during elicitation

# General Process Flow

- Analyze Stakeholder Requirements
  - Analyze the complete set of requirements
    - Analyze subsets defined around a common requirements context
      - Focus on individual requirements and then subsets of related requirements
      - Standard items such as **readability**, correctness, consistency, completeness, accuracy, testability, etc.
  - Verify scope and need for all requirements
  - Resolve problems with Stakeholders
  - Obtain concurrence that requirements and context is correct and complete

# General Process Flow

- **Approve Stakeholder Requirements**
  - Obtain Project Executive Management approval of the requirements
    - Establishes the Project Requirements Baseline
      - The commitment between the Project, Executive Management and the Stakeholders on what will be delivered and/or provided
  - Place the approved (Project Baseline) requirements under formal Configuration/Version Control
- **Project Requirement Definition is complete and Requirements Management begins**
  - Similar mini-efforts may be done for Change Requests per the Change Management Plan



# Requirements Quality

- What are “Quality” Requirements?
  - 1. “Quality” Requirements implies that the documented requirements have a high degree of correctness, completeness, consistency, accuracy, etc.
  - 2. “Quality” Requirements **COMMUNICATE** the Stakeholders **needs** to potential vendors so that both the State and vendors have the same understanding of what is required
- Quality is Built-in, NOT Added-in
  - The process used and artifacts produced are the Foundation for understanding and communicating the Shared Vision/View of what is needed



# Exercise and Break

- See Handout



# Requirements Management



# What's Requirements Management?

## ■ ISO/IEEE 29148 Standard Definition

■ “[The] activities that ensure requirements are identified, documented, maintained, communicated and traced throughout the life cycle of a system, product, or service”

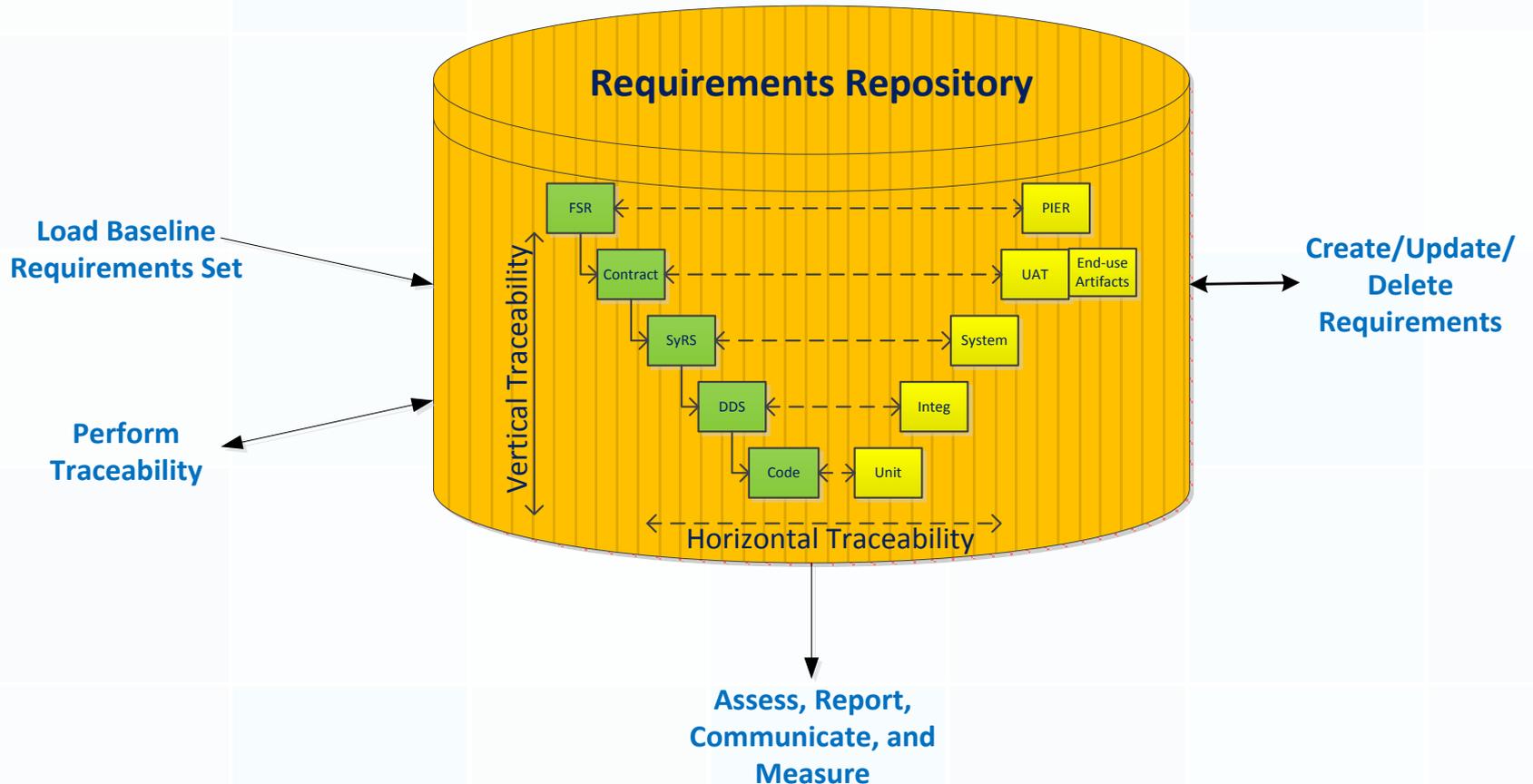
■ Recommended approach does not include the initial Requirements Identification/documentation as part of Requirements Management

## ■ Requirements Management then deals with ...

■ Capturing/Documenting, maintaining, communicating, and tracing requirements throughout the project life cycle

# What's Requirements Management?

## Requirements Management Process World





# Requirements Management Activities

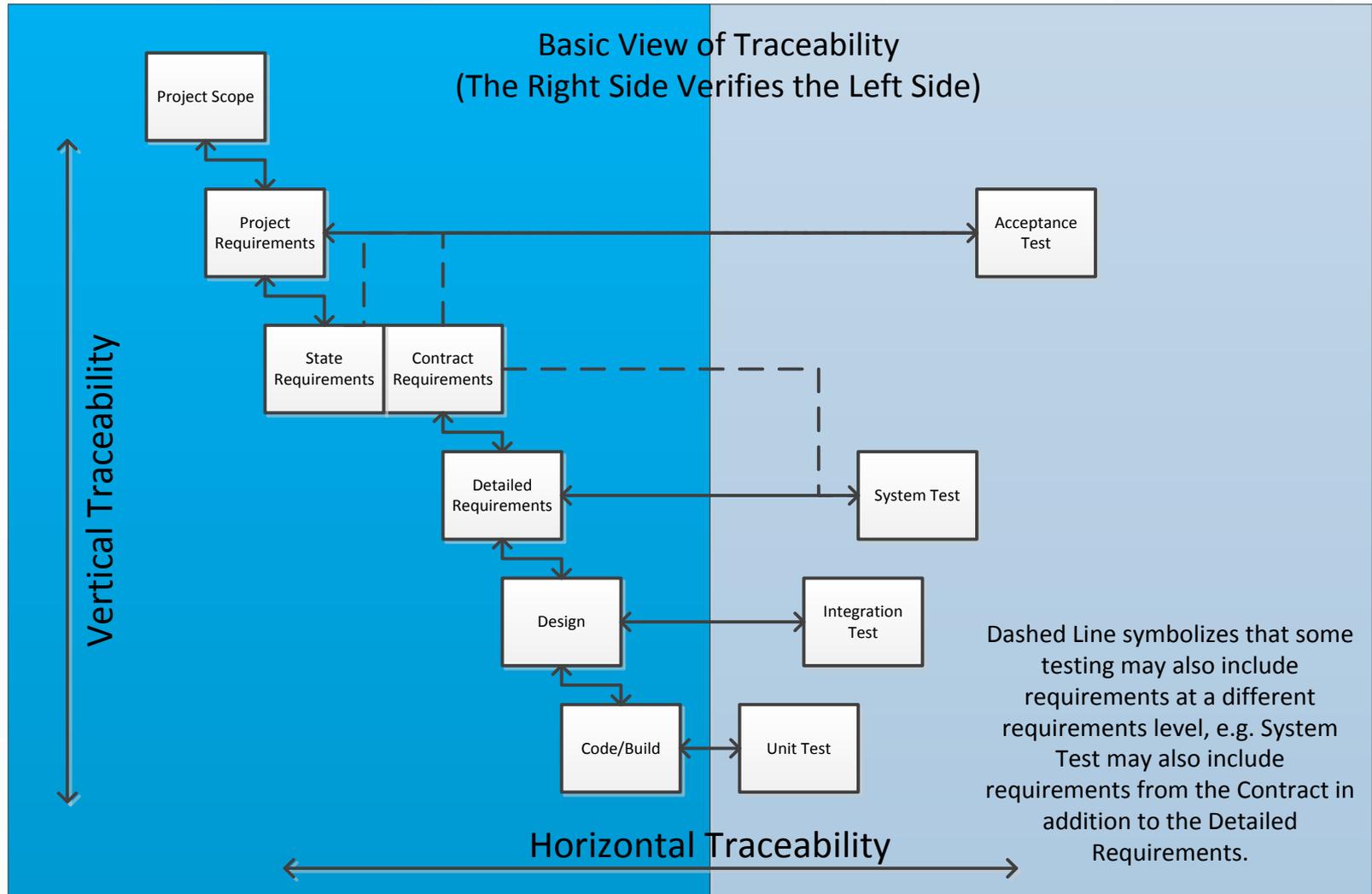
- **Key Predecessors for Performing Requirements Management**
  - **Planning and scheduling the activities and tasks that will be Performed**
    - Includes specifying the “Level of Traceability” and how Requirements Management will be performed and integrated into the other PM Processes
  - **Identifying direct and indirect resources involved**
  - **Manage the Effort**
    - Ensuring critical integration with Change Management
    - Turnaround times for Requirements Management tasks are often very short so as to not impact other efforts
    - Issues, such as traceability gaps, must be resolved quickly

# Requirements Management Activities

- **Establish Controlled Requirements Repository**
  - Includes both establishing the repository and creating the Project Requirements Baseline(s)
- **Performing Requirements Traceability & Analysis**
  - Performed incrementally as requirements are captured, both Vertical and Horizontal
  - Maybe, and often is, performed by multiple teams
- **Managing Requirements Changes**
  - Assessing impacts of proposed changes, capturing approved changes, and communicating the changes
- **Requirements Metrics and Reporting**



# Requirements Traceability



# Requirements Traceability

- Vertical Traceability performed incrementally as requirements are approved at each level
  - Mapping relationships between requirements at different levels
    - E.g., Project Requirements ↔ Contract ↔ Requirements Deliverable ↔ Design Deliverable
- Horizontal Traceability performed as soon as corresponding requirements level baselined
  - Mapping relationships between requirements and tests that verify the requirements
    - E.g., Project & Contract Requirements ↔ User Acceptance Test, Design ↔ Integration Test



# Break



# Common Problems and Pitfalls

- **Lack of Planning**
  - Not identifying level of traceability to be performed
- **Insufficient Tools**
  - MS Excel is generally insufficient
- **Inexperienced Resources Performing RM**
  - Extremely Difficult to Learn On-the-Job
- **Identifying Requirements at too high of a Level**
  - Very common as it greatly simplifies traceability but loses all benefits of performing Requirements Management
- **Change Management bypasses RM**
  - Impacts of Proposed Changes Not Understood until After Approved
- **RM activities performed late or not at all**



# Impacts if Not Done Right

- **Incorrect Expectations Between Stakeholders, Project, and Vendor(s)**
  - Failure to communicate
- **Failure to Identify and Deliver All Required by the Project Scope Statement**
  - Failure to identify and trace
- **Inability to Know when Items, Functionality, etc. is Dropped or Forgotten until the End of the Project**
  - Failure to trace and/or manage changes
- **Inability to Know if Everything was Tested or Verified and when Testing is Complete**

# Impacts if Not Done Right

- Failure to Identify Project Requirements First Leads to unclear Liabilities for State
  - Liabilities appear during requirements allocation and must be addressed in RFP
- Poor RFP requirements results in an increased proposed cost due to risk
  - Think vague requirements beneficial - **WRONG**
  - Careful vendors typically protect themselves by incorporating assumptions or other statements in their proposal



# Summary

- Write Requirements to **Communicate** the Stakeholders Needs
  - Plan your approach
  - ID Stakeholders and techniques, elicit, analyze, resolve, validate, and approve
  - Work top down from the Scope to Project Requirements and then allocate responsibilities
- Manage Requirements through the Lifecycle
  - Plan your approach
  - Integrate approach with PM processes
  - Let the Requirements Repository be the record-of-fact
  - Perform traceability as complete as possible



# Questions



## ■ Contact

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# Consulting and Planning Division

## ■ Resources

### ■ CPD's Home page

<http://www.cio.ca.gov/cpd/default.asp>

### ■ Consulting landing page

<http://www.cio.ca.gov/cpd/consulting.asp>

### ■ CPD Project Plans and Tools

<http://www.cio.ca.gov/cpd/plansandtools.asp>