ĐẠI HỌC ĐÀ NẴNG
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG VIỆT - HÀN
Vietnam - Korea University of Information and Communication Technology

Software Project Management

Concepts, Terms and Definitions

Lecture Objectives

- Project Concepts, Terms and Definitions
  - Project
  - Project Attributes

What is a Project?

"…A project is a temporary endeavor undertaken to create a unique product or service."

- *Temporary means that every project has a definite* beginning and a definite end.
- *Unique means that the product or service is different* in some distinguishing way from all similar products or services.

* From the Project Management Institute's (PMI) *Project Management Book of Knowledge (PMBOK), page 5.*

Important Project Attributes

- Objectives
- Stakeholders
- Plan
- Schedule
- Budget
- Risks and Issues
- Estimation
- Change
- Process & Methodology
- Measures and Metrics
- Project Manager

Project Objectives

- What the project is to achieve:
  - Must be aligned with business goals
- Project objectives are defined by:
  - Measurable definition(s) of success
  - Project acceptance criteria
  - Requirements
- Multiple stakeholders may have conflicting objectives & requirements:
  - Must be identified & resolved at the beginning of the project

Project Objectives

- Measurable definition(s) of success. Example:
  - “Increase service order throughput capacity by 50% without increasing time, errors or effort.”
- Project acceptance criteria:
  - The quantifiable criteria that must be met for the project to be considered successful.
    - Product, Deliverables, Cost, Schedule, Quality, etc.

Stakeholders

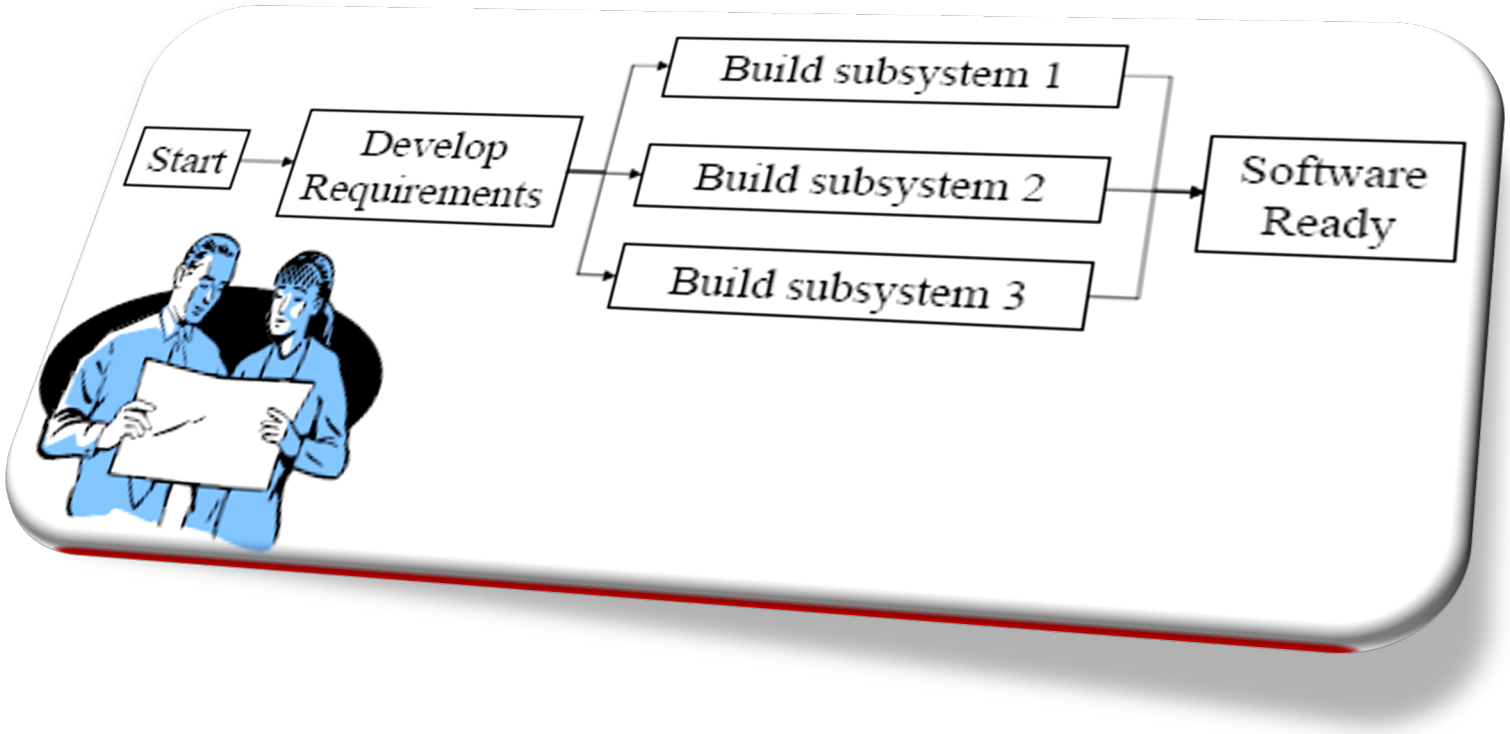
- Anyone who participates in or can influence your project, typically:
  - Project Sponsor(s)/Customer(s)
  - Executives
  - Project Team
  - Users
  - Contractors
  - Functional Managers
- The project manager must identify them.
- The project needs to “satisfy” them.

Plans

- "A method devised for making or doing something or achieving an end."*
  - Describes project scope.
  - Describes the approach for completing the project (methodology & process).
  - Describes how the project deliverables are to be built.
  - Describes the schedule, resources & budget.
- Varies as is appropriate for project.
- Needs to be documented for effective communication.

Plans

- What do you notice about this plan?



Planning Documents

Example Planning Documents:

- Scope Planning
- Scope Definition
- Activity Definition
- Activity Sequencing
- Activity Duration Estimating
- Resource Planning
- Cost Estimating
- Cost Budgeting
- Risk Planning
- Schedule Development
- Quality Planning
- Communications Planning
- Organization Planning
- Staff Acquisition
- Procurement Planning
- Project Plan Development

Project Plan Outline (IEEE 1058.1)

1. Introduction
2. Project Organization
   - Process model
   - Organization structure
   - Organization boundaries and interfaces
   - Project responsibilities
3. Managerial Process
   - Management objectives and priorities
   - Assumptions, dependencies & constraints
   - Risk management
   - Monitoring & controlling mechanisms
   - Staffing plan

Project Plan Outline (IEEE 1058.1)

4. Technical Process
   - Methods, tools and techniques
   - Software documentation
   - Project support functions
   - Quality assurance
   - Configuration management
   - Verification and validation
5. Work packages, schedule and budget
   - Work packages
   - Dependencies
   - Resource requirements
   - Budget and resource allocation
   - Schedule

Many Different Plans

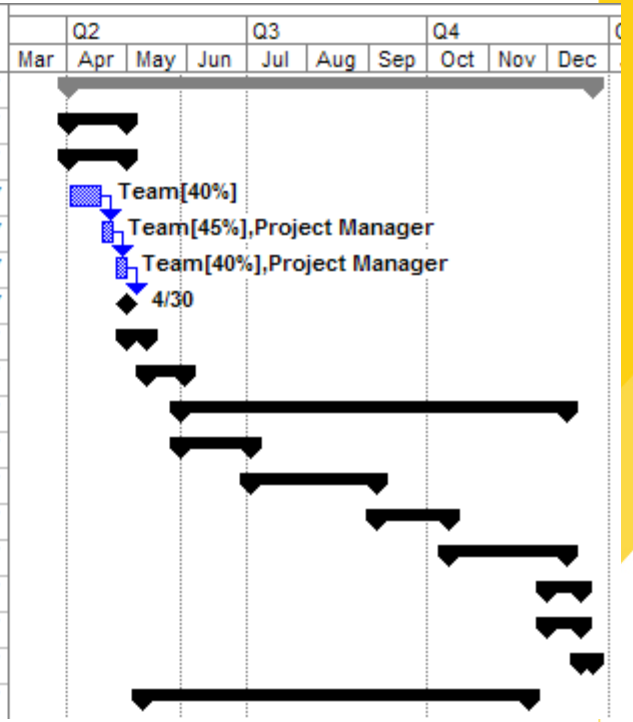
- Not “one size fits all.”
  - Planning must be appropriate for the project.
- Never fill in templates blindly.
  - Always know how templates help your project. Ignore sections that aren’t useful.
- Your organization may have templates, or get them from:
  - Institute of Electric and Electronic Engineers (**IEEE**)
  - Project Management Body of Knowledge (**PMBOK**)
  - Capability Maturity Model Integrated (**CMMI**)

Schedules

- The Tasks, Deliverables and Milestones that will achieve the plan.
- Tasks, Deliverables and Milestones ...
  - have Resources assigned to them ...
  - have Predecessor and Successor tasks ...
- Resource Hours worked = Effort
- Elapsed Calendar time = Duration
- Schedules will have a Critical Path

Sample Schedule

ID	Task Name	Cost	Work	Start	Finish
0	**Project_Plan V1.0**	**$233,325.54**	**4,959.27 hrs**	**Mon 4/2/07**	**Mon 12/24/07**
1	**Planning**	**$7,480.00**	**129.6 hrs**	**Mon 4/2/07**	**Mon 4/30/07**
2	**Project Plan**	**$7,480.00**	**129.6 hrs**	**Mon 4/2/07**	**Mon 4/30/07**
3	Draft Project Plan	$2,880.00	38.4 hrs	Mon 4/2/07	Tue 4/17/07
4	Review Project Plan	$2,360.00	46.4 hrs	Wed 4/18/07	Mon 4/23/07
5	Revise Project Plan	$2,240.00	44.8 hrs	Wed 4/25/07	Mon 4/30/07
6	***Project Plan Signed-off***	$0.00	0 hrs	Mon 4/30/07	Mon 4/30/07
7	**Kick-Off**	**$4,307.27**	**58 hrs**	**Tue 5/1/07**	**Fri 5/11/07**
16	**Inception & Elaboration**	**$13,992.44**	**192.05 hrs**	**Fri 5/11/07**	**Wed 5/30/07**
27	**Construction**	**$174,754.26**	**4,104.5 hrs**	**Mon 5/28/07**	**Tue 12/11/07**
28	**Work Package 2 / CAP2**	**$32,100.00**	**756 hrs**	**Mon 5/28/07**	**Tue 7/3/07**
42	**Work Package 3 / CAP3**	**$53,013.00**	**1,354.9 hrs**	**Tue 7/3/07**	**Wed 9/5/07**
56	**Work Package 4 / CAP4**	**$33,660.85**	**717.8 hrs**	**Wed 9/5/07**	**Fri 10/12/07**
70	**Work Package 5 / CAP5**	**$55,980.42**	**1,275.8 hrs**	**Fri 10/12/07**	**Tue 12/11/07**
84	**Transition**	**$9,900.00**	**140 hrs**	**Fri 11/30/07**	**Tue 12/18/07**
85	**User Acceptance Test (Syst**	**$9,900.00**	**140 hrs**	**Fri 11/30/07**	**Tue 12/18/07**
89	**Close-out**	**$5,677.81**	**91.2 hrs**	**Tue 12/18/07**	**Mon 12/24/07**
95	**Administration**	**$17,213.75**	**243.9 hrs**	**Wed 5/9/07**	**Wed 11/21/07**



Tasks, Deliverables & Milestones

- Tasks define the work to be done.
  - Tasks should be measurable, should include a verb and should be associated with a deliverable.
- Deliverables are the goods that the project is producing.
  - Some provided to customer.
  - Some used to manage/control the project.
- Milestones are tasks with no duration.

Resources

- Work takes resources over time.
- Three types of resources:
  - Reusable (Trucks, Equipment)
  - Consumed (Cable, Natural Resources)
  - Human

Predecessor & Successor Tasks

- *Hard Task Relationship*
  - Based on tasks
  - Four types of hard task relationships:
    - Start to Start
    - Start to Finish
    - Finish to Start
    - Finish to Finish
- *Soft Task Relationship*
  - Based on available resources
- Task Relationships can have delays, called 'lag'
  - For example: Finish to Start + 3 days

Budgets

- A budget describes the total project cost:
  - Start-up costs
  - Hardware & Software costs
  - Resource costs
  - Outsourcing and Contractor costs
  - Travel & Entertainment costs
  - Product Development costs
  - Testing costs
  - Production costs
  - Overhead & Management costs
  - Project Closeout costs
  - Etc.

Risks

- A risk is an event that could happen, but has not yet occurred.
- Risk Management consists of:
  - Risk Assessment
    - Risk Identification
    - Risk Analysis
    - Risk Prioritization
  - Risk Control
    - Risk Management Planning
    - Risk Resolution
    - Risk Monitoring

Risks

- Important risk attributes:
  - Description of risk event, including what can happen if the risk event occurs.
  - Impact if the risk event occurs.
  - Probability of the risk event occurring.
  - Response for managing the risk.
- Risk Priority = Impact * Probability

Example Risk

- "Vendor is 4 weeks late on their deliverable."
  - Description:
    - The vendor has told us that they may be up to 4 weeks late with their deliverable. This will cause our project to slip by 4 weeks.
  - Probability (1 – 5, where 5= high probability):
    - 4
  - Impact (1 – 5, where 5 = high impact):
    - 4
  - Response:
    - Negotiate additional resources with vendor.

Problems and Issues

- Problems and Issues are events that have already occurred.
- Problem & Issue Attributes:
  - Description, including the impact
  - Issue owner
  - Assigned date
  - Due date
  - Status (open, working, rejected, tested, closed)

Example Issue

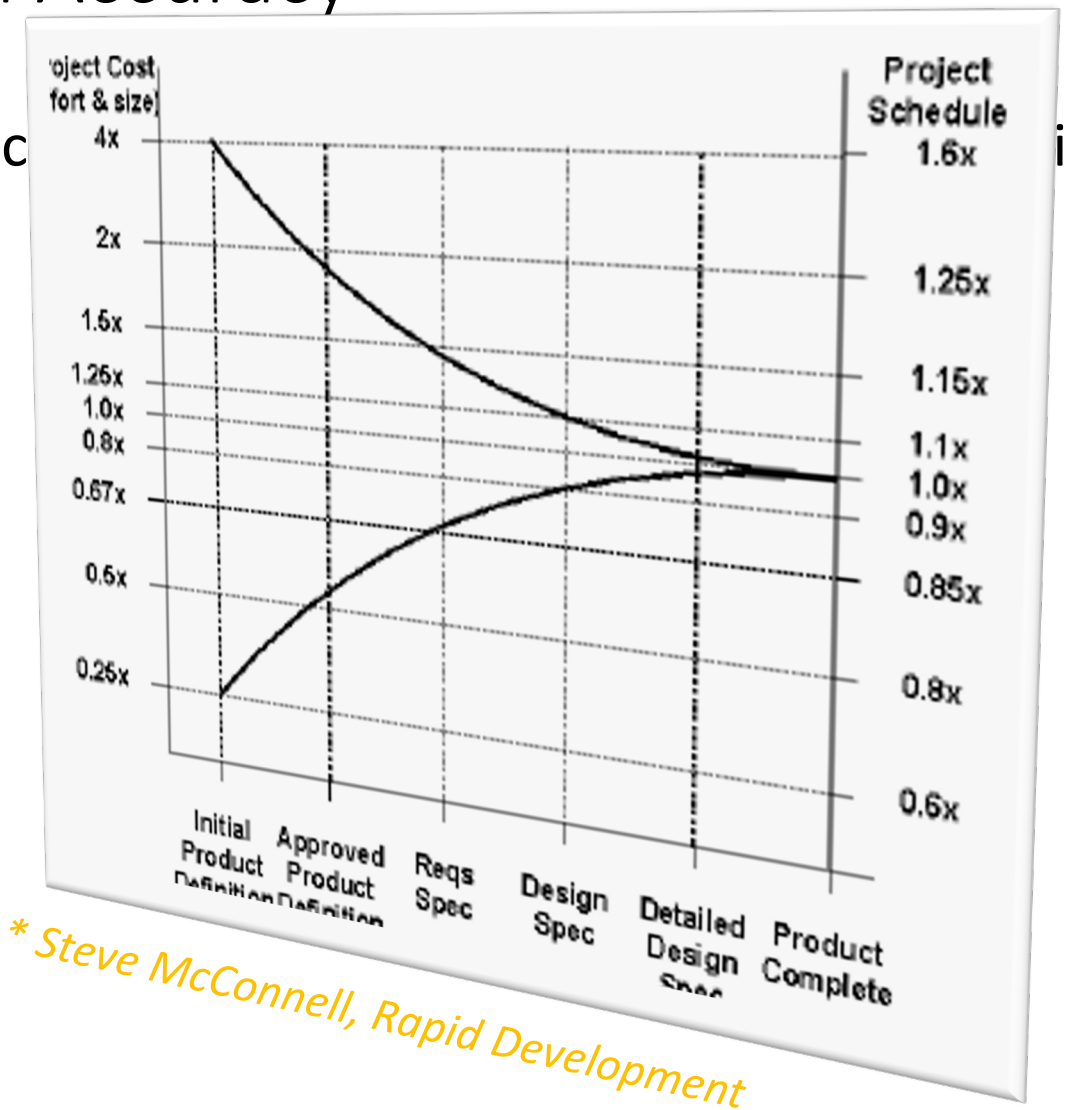
- Issue: Development server continues to crash, causing lost data and lost productivity.
  - Owner: Luong, Vo Van
  - Assigned Date: May 10, 2011
  - Due Date: May 11, 2011
  - Status: Open

Estimation

- Typical goals are to complete the project, with quality, in as quickly and as cost effectively as possible.
- Estimation provides answers to:
  - When will it be done?
  - How much will it cost?
- Many software engineers don’t like to estimate.
  - They may have been “burned” in the past.

Estimation Accuracy

- Estimation accuracy sc is done.*



* Steve McConnell, Rapid Development

Project Change

Change can occur anytime.

Sources of change:

- Your Executives
- Customer's Executives
- Your Development Team
- Market
- Competition
- Regulations
- Technology
- Others …

Project Change Alternatives

- Change alternatives:
  - Prevent
  - Manage
  - Embrace

Process

- “Any repeatable set of actions a team decides to perform on a regular basis to make sure that something is done in a certain way.”*
- Example:
  - How code gets checked in, tested and built.

** Scott Berkun, The Art of Project Management*

What makes a Good Process?

- Characteristics of good processes:*
  - They accelerate progress.
  - They prevent problems.
  - They make important actions visible and measurable.
  - They include a process for changing or eliminating the process.
  - People impacted by the process are in favor of the process.

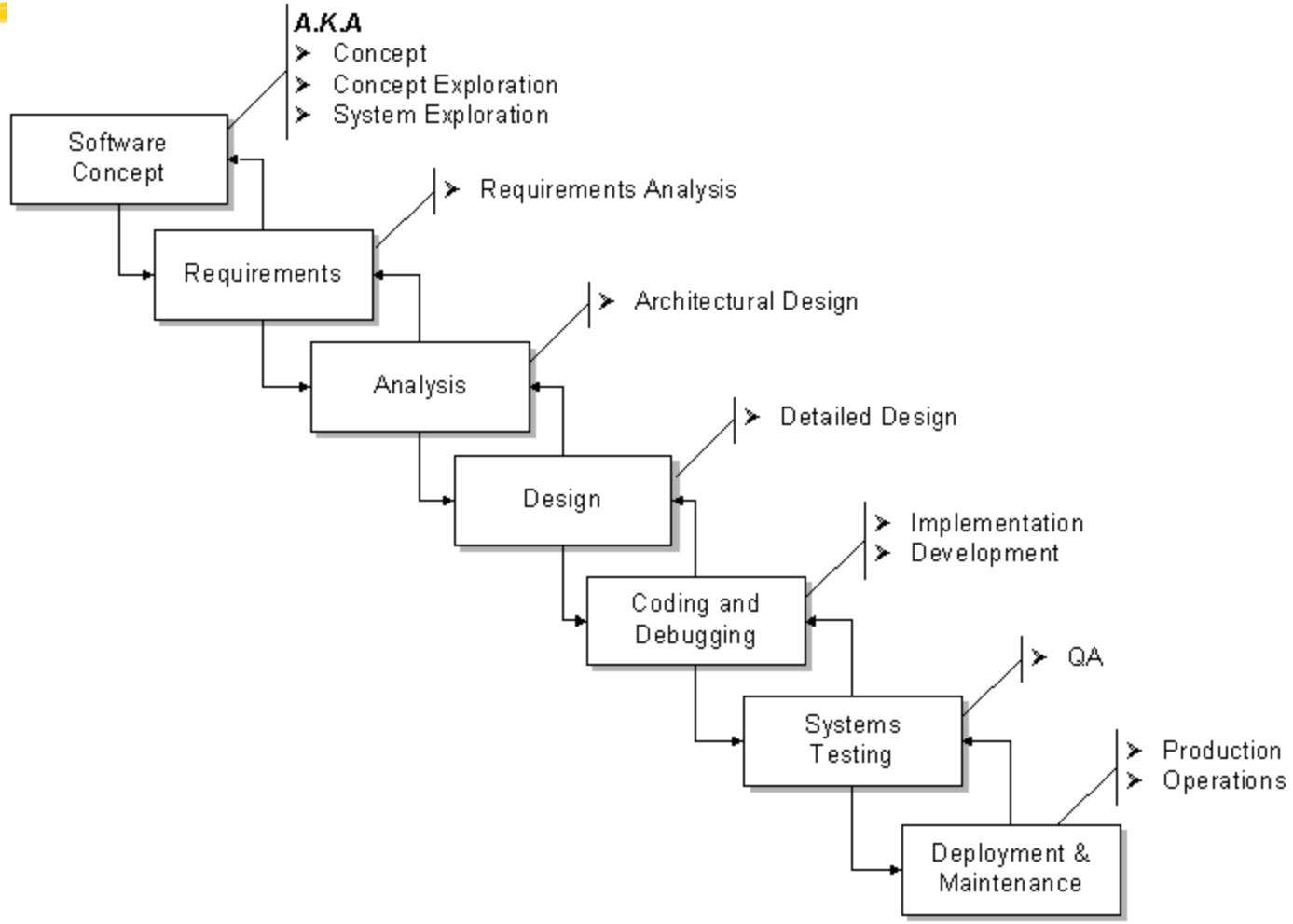
What About Bad Processes?

- Bureaucracy (n): “An administrative system in which the need or inclination to follow rigid or complex procedures impedes effective action.”*
- If the bad process is within your domain of control:
  - Change it.
- If the bad process is Not within your domain of control:
  - Shield your team from it.
  - Rally your team around a counter process.
  - Ignore the process (may be a “CLM”).

Methodology

- A prescriptive model of the collection of all activities from the time a product is first conceived until it is no longer in service.*
  - Establishes the order in which a project specifies, prototypes, designs, implements, reviews, tests and performs its other activities.
  - Establishes the criteria used to determine whether to proceed.

Example Methodology - Waterfall



Measures and Metrics

- Measure
  - The size or extent of something, especially in comparison with a known standard. For example:
    - Number of defects.
    - Thousand Source Lines of Code (KSLOC).
- Metric
  - A calculated or composite indicator based on two or more measures.
  - A quantified measure of the degree to which a system, component or process possesses given attributes.

  For example:
  - Number of defects per KSLOC.

Example Metric

- A combination of two or more metrics gives information meaning. For example, compare:
  - 10 defects/KSLOC (Is this good? Bad?)

Versus

- Release 1 - 14 defects/KSLOC
- Release 2 - 10 defects/KSLOC
- Release 3 - 8 defects/KSLOC
- (The trend is clearly good)

Why Measure?

- To establish realistic project expectations.
- So you can control the project and communicate status and progress.
- To understand the software process.
- To focus people's activities on the process.
- To improve morale by bringing attention to chronic problems.
- To improve business performance.
- To lay the foundation for long-term improvement.

Why Project Managers?

- To augment the value of everyone around them.
- To help organize the team and the work.
- To shield the team from politics.
- To communicate with the stakeholders.
- To find clever workarounds for difficult and unexpected problems.
- To boost enthusiasm and morale.
- To “make good stuff happen.”
- …

Summary

Described the characteristics of:

- Objectives
- Stakeholders
- Plan
- Schedule
- Budget
- Risks and Issues
- Estimation
- Change
- Process &
- Methodology
- Measures and
- Metrics
- Project
- Manager

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Questions & Answers

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