# IT Project Management

CIS 3001

**Session 5: Scope & WBS**


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Dept of Computer Information Systems

# Learning Objectives – Scope Management

Defining and Managing Scope

- Understand and describe the relationship among scope, schedule, and budget.
- Understand the processes and apply several tools for defining and managing the scope of a project.
- Understand the difference between project scope (i.e. project deliverables) and product scope (i.e. features and functionality of the product or system).

WBS

- Develop a Work Breakdown Structure (WBS).
- Differentiate between a deliverable and a milestone.

Time Estimation

- Describe and apply several project estimation methods.


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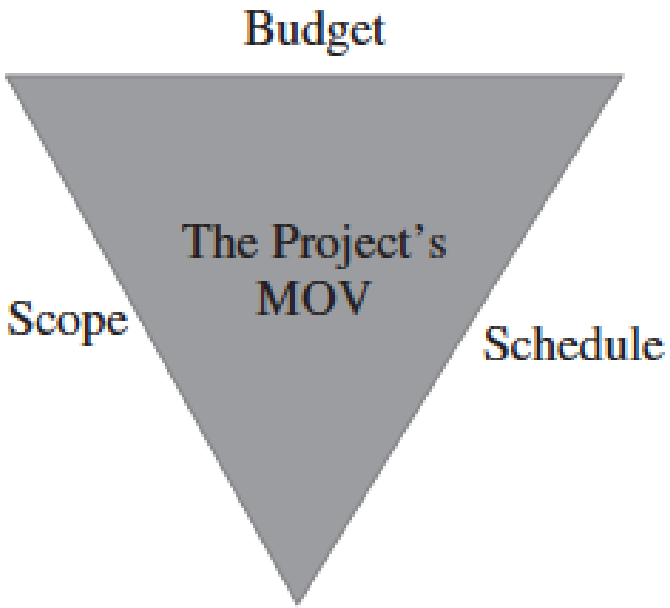
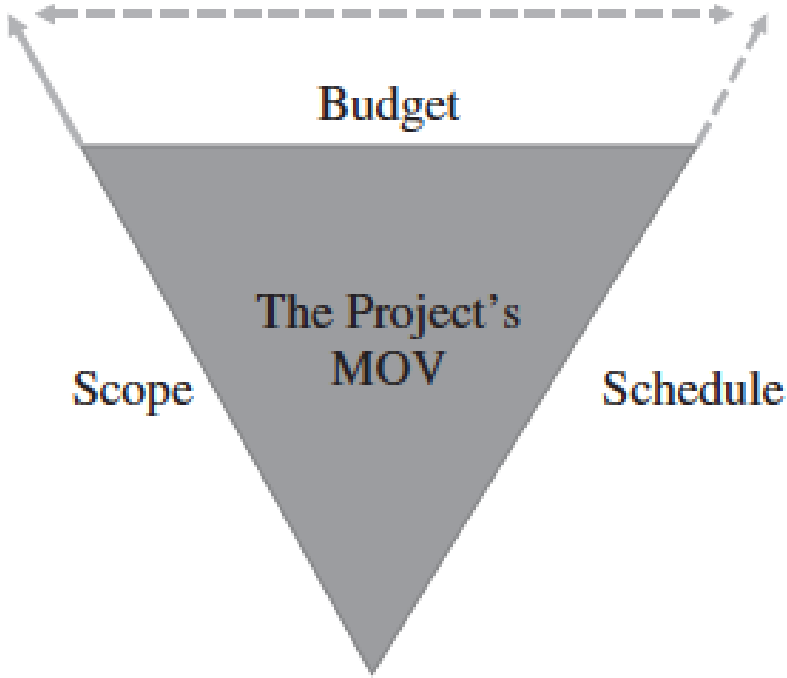
# Triple Constraint




The project is balanced or "in harmony" when the schedule and budget support the project's scope in order to achieve the MOV.




The project becomes imbalanced when scope increases without adjusting schedule and budget accordingly.

# Scope & WBS

Scope

- Establish what needs to get done.
- Establish boundary to distinguish what is in scope from what is out of scope.

Work Breakdown Structure (WBS)

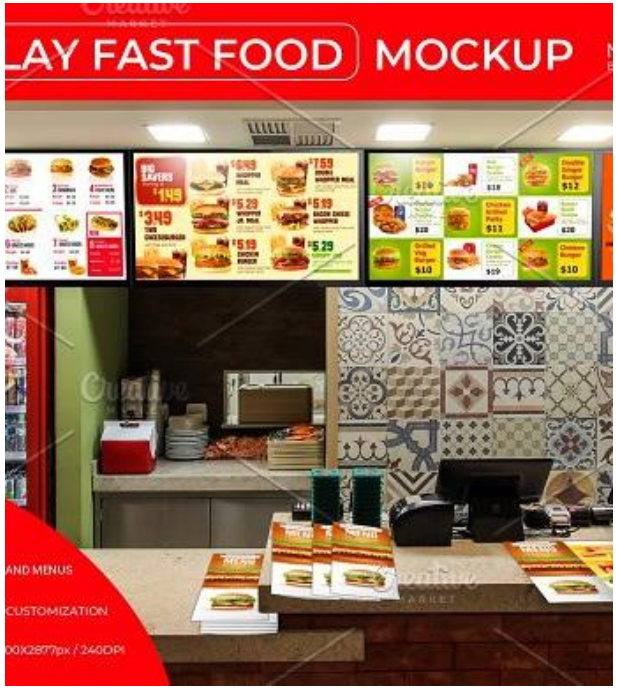
- Clarifies how the work will get done
- Hierarchical structure
  - Tasks, summary tasks, multiple levels of nesting & decomposition
  - bridge to detailed project plan

# Scope Management Processes – 6 Steps

| | | |
|---|---|---|
| 1 | **Plan Scope Management** | Defines and Documents how the project and product scope will be defined, verified, and changed if necessary. |
| 2 | **Collect Requirements** | Centers on defining and documenting the stakeholders' needs to properly manage expectations |
| 3 | **Define Scope** | A detailed description of project and the product. It should define what work will and will not be included in the project. |
| 4 | **Create Work Breakdown Structure (WBS)** | The decomposition or dividing of the major project deliverables into smaller and more manageable components. |
| 5 | **Verify Scope** | Confirmation and formal acceptance that project's scope is accurate, complete, and supports the project's goal. |
| 6 | **Control Scope** | Ensuring that controls are in place to manage proposed scope changes one the project's scope is accepted. These procedures must be communicated and understood by all project stakeholders. |

# 2 Collect Requirements

- Interviews
- Workshops
- Brainstorming Sessions
- Focus Groups
- Surveys
- Observing People While They Work
- Others?

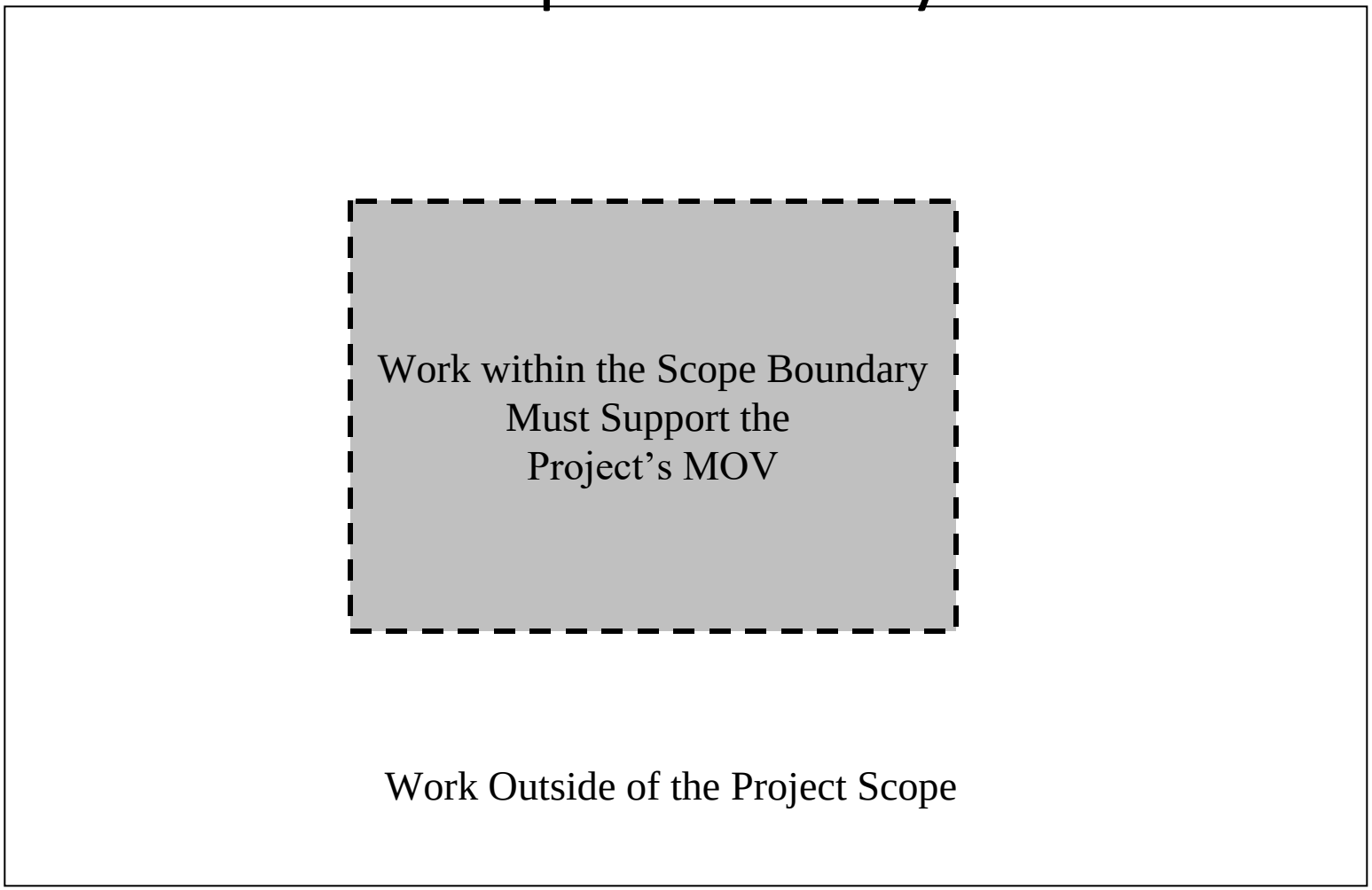



# 3 Define Scope

- Project-Oriented Scope
  - Support the project management processes defined by the Project Life Cycle (PLC) and the chosen project methodology.
  - Deliverable Structure Chart – a tool used by the project manager and team.
- Product-Oriented Scope
  - Specific features and functionality of the application system
  - **First cut** of requirements definition
  - Use Case Diagram – a system modeling tool used for refining the scope boundary and defining what the system must do.

# *How Do We Define Scope?*

## Scope Boundary



# How Do We Define Scope?

**METHOD A**

## Statement of Work (SOW)

- Narrative description of the product, service, or information system.
- For internal projects, this is tied to the business need
- For external projects,
  - this would include specifications, quantities, quality standards, and performance requirements for prospective bidders and
  - The SOW is often included in a document that may be called a request for proposal (RFP), request for information (RFI), or request for bid (RFB).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# Sample SOW Template

STATEMENT OF WORK

This Template Statement of Work is a sample provided for your information only and may not be relied upon as legal advice. This Template might not be appropriate for your requirements. Elance makes no warranty about the suitability of this Template and accepts no liability arising out of the use of this Template. Please consult your legal or business advisor for further information or advice.

THIS STATEMENT OF WORK (this "SOW") is entered into by and between the undersigned Buyer and Service Provider pursuant to the Project Services Agreement (the "**Agreement**") governing the following Project:

Elance Project ID:
Elance Project Name:

All capitalized terms not defined in this SOW have the meanings given to such terms in the Agreement, unless the context requires otherwise. The information in this SOW shall be considered Confidential Information under the terms of the Agreement.

**1 Project Description**

Insert details describing Project not previously entered on the Site

**2 Key Assumptions**

Insert detailed assumptions necessary to the Project, including configuration, application customization, and infrastructure

**3 Scope of Services**

List the specific features, functions, capacity, performance, and qualities required in the Work Product, any exceptions, and any that are prohibited.

**4 Milestone Deliverables**

The Business Terms contains a maximum of five Milestone Deliverables (four plus final delivery and payment equals five). Here state details describing each of the five deliverables not previously entered in the Milestone Deliverables. Elance will not support more than five Milestone Deliverables for Milestone Escrow payments. Nevertheless, this SOW section can break down the Milestone Deliverables into sub-deliverables. Tables containing potential Milestones and Sub-Milestones and the associated Milestone Deliverables are appended to this Template SOW as Attachment 2 for your information.

**5 Duration of Services**

Provide details for the project schedule and resource plan agreed upon to achieve project milestones. Project start and end dates should be clearly define.

**6 Acceptances**
Here insert any acceptance criteria and methodology if different from the Business Terms

**7 Change Control**

Here insert any change control methodology.

**8 Compensation**

**8.1 Fees**

Insert fee details (time and materials/fixed fee) and total budget agreement. Insert agreed hourly rates for project work outside of scope.

**8.2 Expenses**

Insert details for reimbursable expenses, invoicing cycle and budget.

**8.3 Remittance**

Invoicing will be performed via the Elance system for accepted hours, milestones, and deliverables. Inquiries regarding invoices for this SOW should be addressed to:
Insert contact details

# How Do We Define Scope?

**METHOD B**

## Scope Statement

A **scope statement** is another way to define the scope boundary; it is a detailed documentation of the sponsor's needs and expectations.

**Examples of Scope Statements**

1. Develop a proactive electronic commerce strategy that identifies the processes, products and services to be delivered through the World Wide Web.
2. Develop an application system that supports all of the processes, products, and services identified in the electronic commerce strategy.
3. The application system must integrate with the bank's existing enterprise resource planning system.

# *How Do You Define Project Scope?*

- The scope boundary and scope statement provide a useful first step
- The project's scope must now be defined in more detail in terms of specific deliverables that provide a basis for developing the project's work breakdown structure (WBS)
- Sample Tools:
  - Deliverable Structure Chart *(Project Oriented Scope)*
  - Use Case Diagram *(Product Oriented Scope)*


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# Deliverables

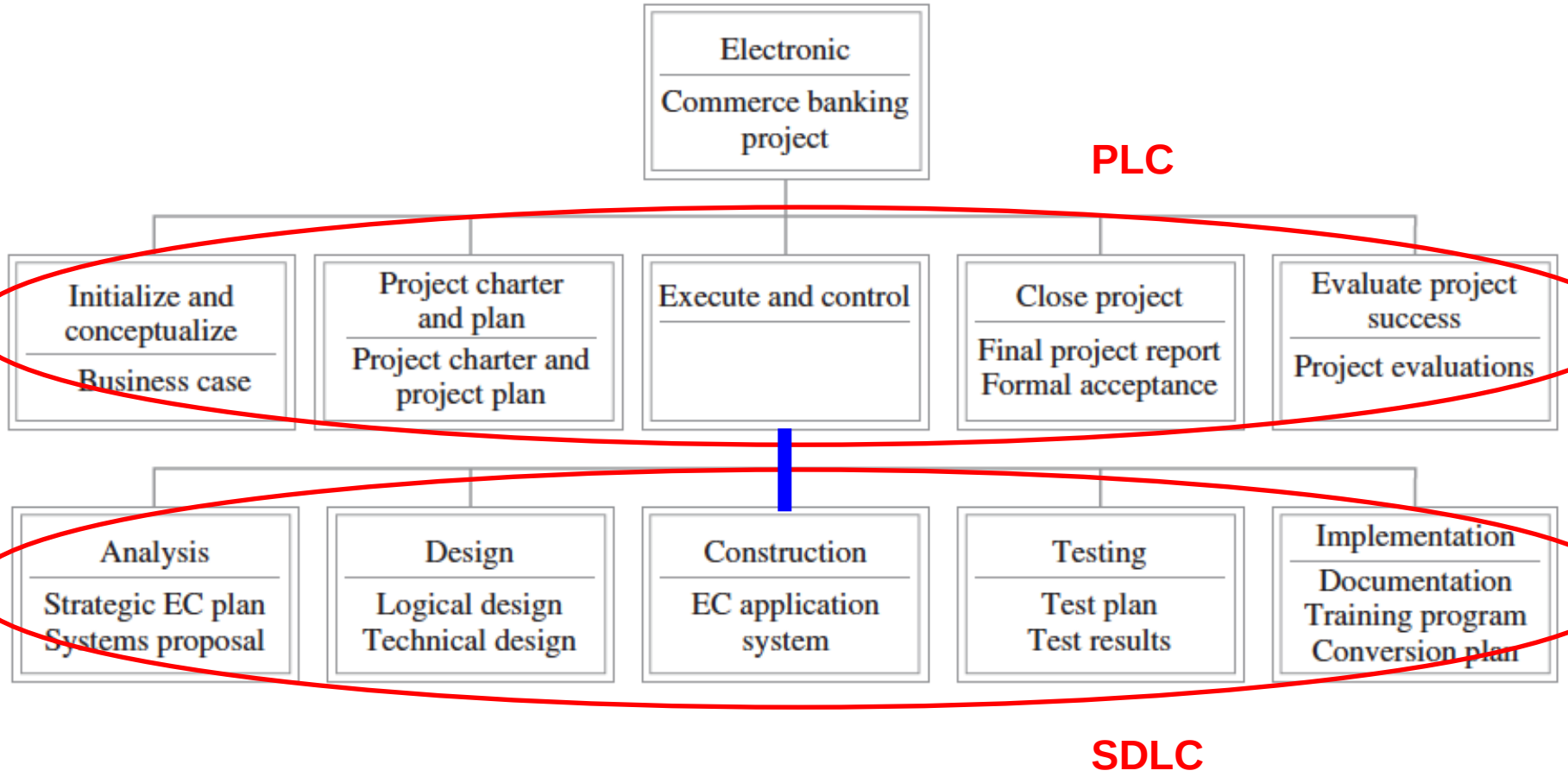
***Definition: A Tangible and Verifiable Work Product***

***2 Types:***

- Project-Oriented Deliverables
  - Support the project management processes defined by the Project Life Cycle (PLC) and the chosen project methodology.
  - Examples
    - Business Case
    - Project Charter
    - Project Plan
    - Testing Plan
- Product-Oriented Deliverables
  - Specific features and functionality of the application system (SDLC)
  - Examples
    - User Authentication
    - Data Migration
    - User Interface Prototype
    - Working system

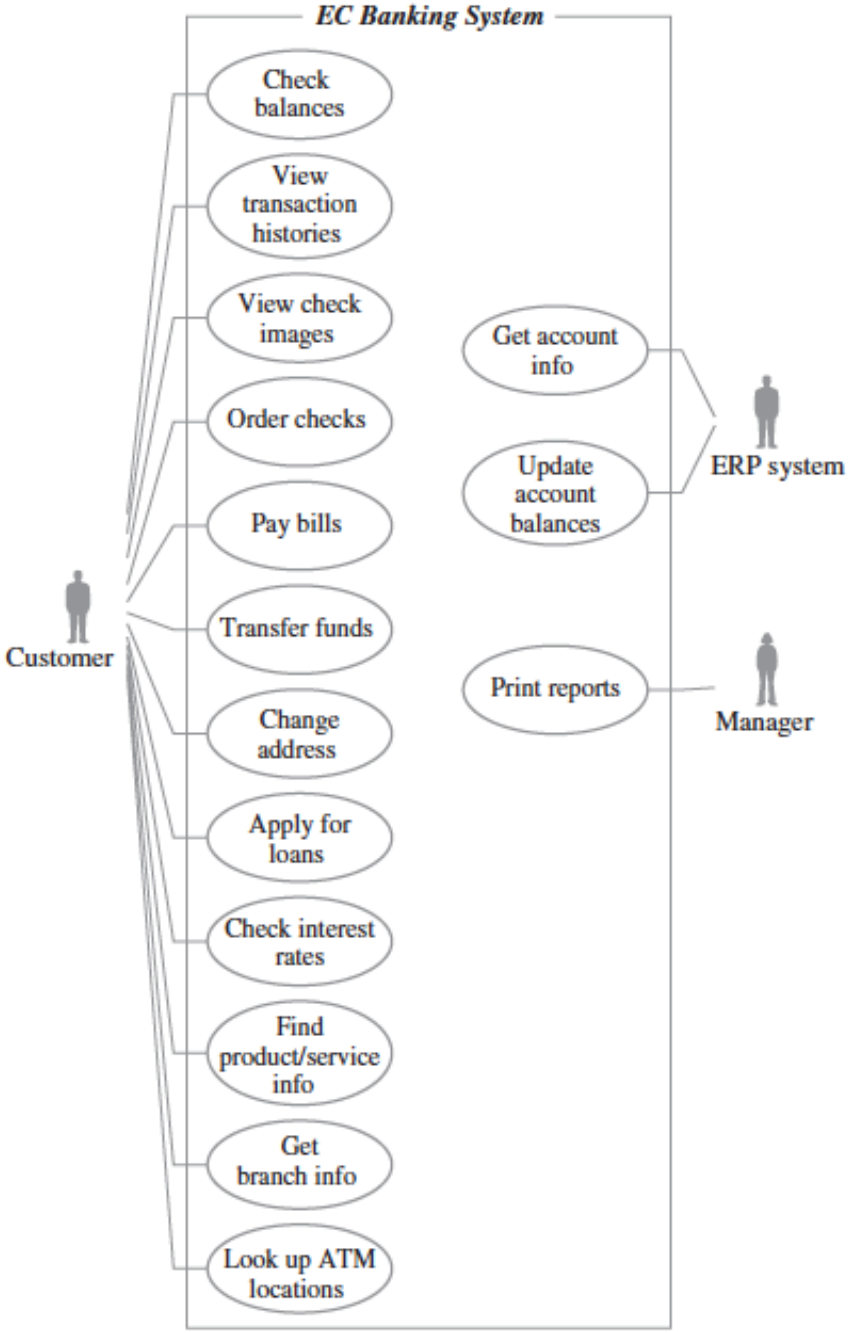
# Deliverable Structure Charter

## *(Project Oriented Scope & Deliverables)*



# Use Case Diagram
*(**Product**-Oriented Scope)*

- **Actors**
- **Use Case**



# User Stories

- Common Structure: *"As a (role), I want (goal/desire)."*
  - Example: As a customer support manager, I want to track customer complaints by product categories.
- Keep it Simple (one idea per story) –
  - Another example: Idea - Create a Login Page for the customer complaint system. (User Story: As a customer, I want to securely login to the vendor's website and submit my complaint.)
- Focus on "What", not "How" (focus on business results/functions, not how to solve it through technologies)
- Relevant to the project
- Avoid ambiguity

# Team Exercise
*(Not Graded)*

- **Project – Build an Online Consumer eCommerce Site** (Think Amazon.com, EBay, etc…)
- **Create a Use Case Diagram To Show –**
  - **Actors**
  - **Use Cases**
- **Create one User Story**
- **Designate a scriber and a spokesperson**
- **10 Minutes Discussion / 2 Minutes Presentation**

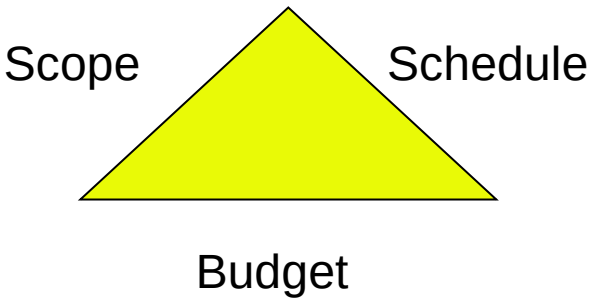
# 5 Validate Scope

- **Verification of the MOV**
  - Has the project's MOV been clearly defined and agreed upon?
- **Documentation of All Deliverables**
  - Are the deliverables tangible and verifiable?
  - Do they support the project's MOV?
- **Specification of Quality Standards**
  - Are controls in place to ensure that the work was not only completed but completed to meet specific standards?
- **Identification of Milestones**
  - Are milestones defined for each deliverable?
- **Review and Acceptance**
  - Are both sides clear in their expectations?

# 6 Scope Change Control

- Concerned with managing changes to the project's scope and to ensure that these changes are beneficial when they occur
- Mitigates:
  - Scope Grope – inability to define project scope
  - Scope Creep – increasing featurism
  - Scope Leap – fundamental & significant change in project scope

- Tools/Procedures:
  - Scope Change Request Form
  - Scope Change Request Log





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## Scope Change Request Form

Requestor Name: _____ Request Date: _____
Request Title: _____ Request Number: _____
Request Description:

Justification:

Possible Alternatives:

| Impacts | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|
| Scope | | | |
| Schedule | | | |
| Resources Required | | | |
| Cost | | | |

**Recommendation:**

**Authorized By:** _____ **Date:** _____

# Figure 5.7 – Scope Change Request Log

| *Request Number* | *Request Title* | *Date of Request* | *Requested by* | *Priority (L, M, H)* | *Authority to Approve Request* | *Expected Response Date* | *Scope Change Approved? (Y/N)* |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |


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# *How Well Will You Be Able To Estimate Budget and Time of A Project? (Builder's Perspective)*

- Build a house

- Build a house –
  - Pre-Construction
  - Construction
  - Closing

- Build a house –
  - Pre-Construction
    - Construction Loan
    - Purchase Land
    - Construction Permit
  - Construction
    - Plot the land
    - Framing
    - Exterior
    - Interior
  - Closing
    - County Approval
    - Settle Accounts
    - Sell House
    - Close on House

- Enough details to help you:
  1. develop the project plan
  2. monitor and compare actual progress to original plan's budget and schedule


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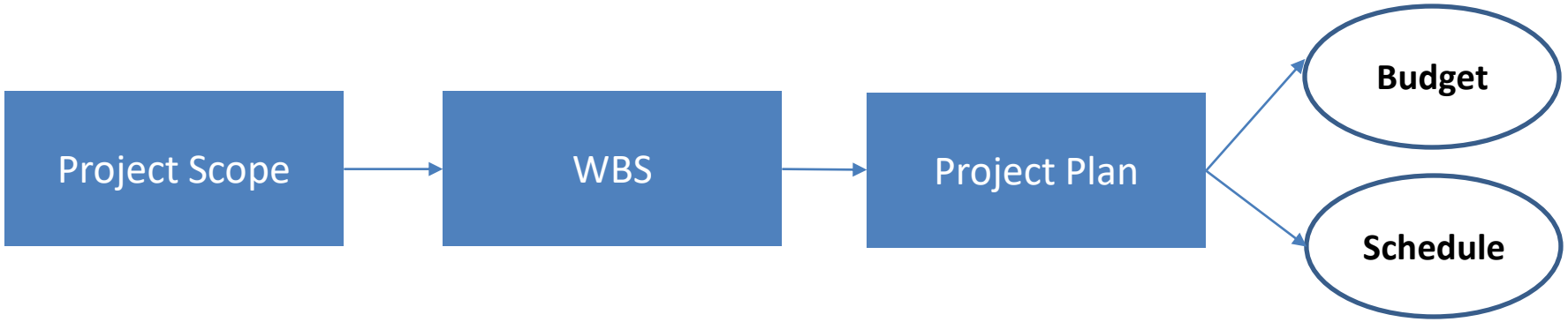
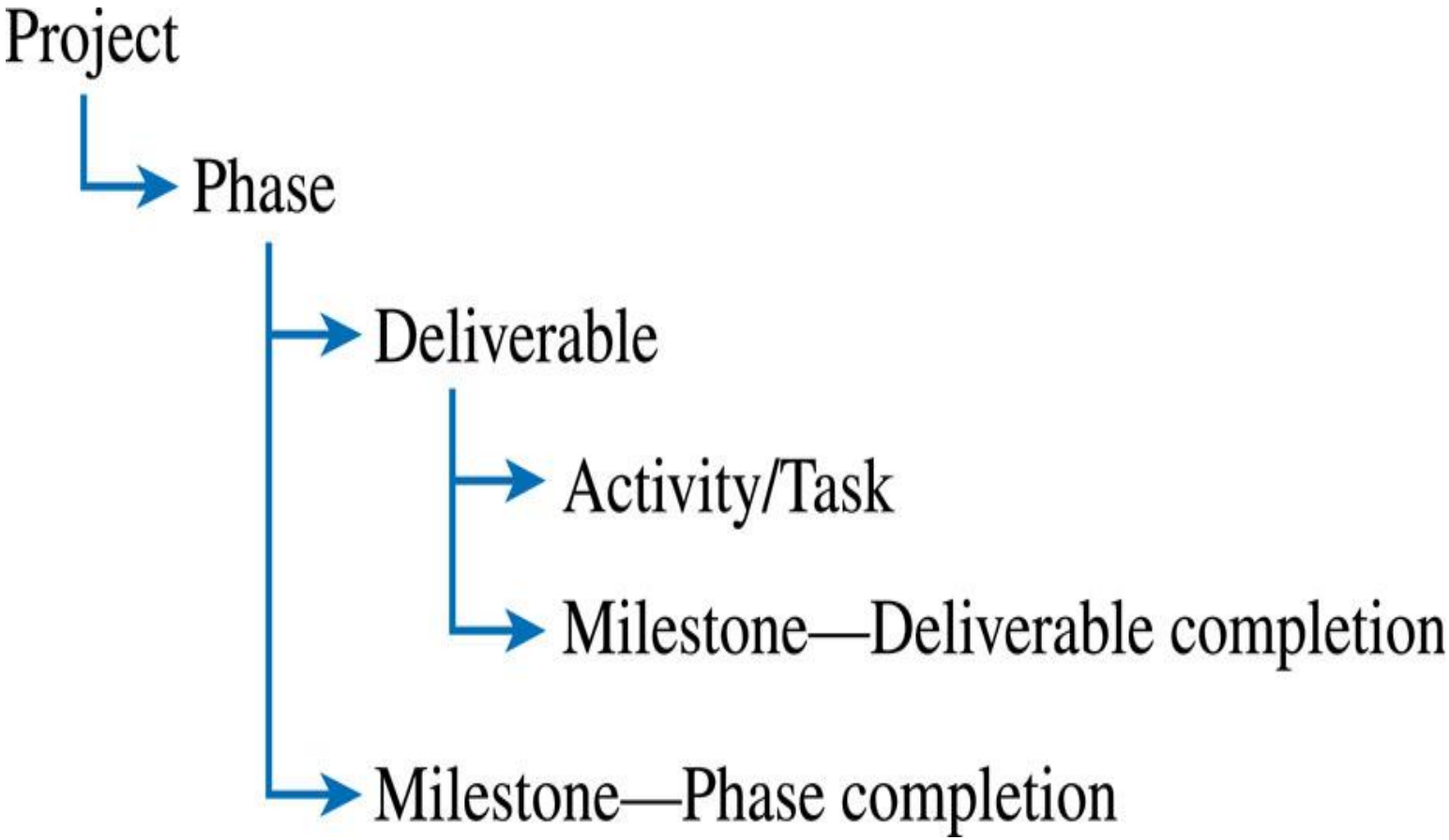
# 4 Work Breakdown Structure (WBS)

- The PMBOK® Guide states that the WBS represents a logical decomposition of the work to be performed and focuses on how the product, service, or result is naturally subdivided. It is an outline of what work is to be performed.

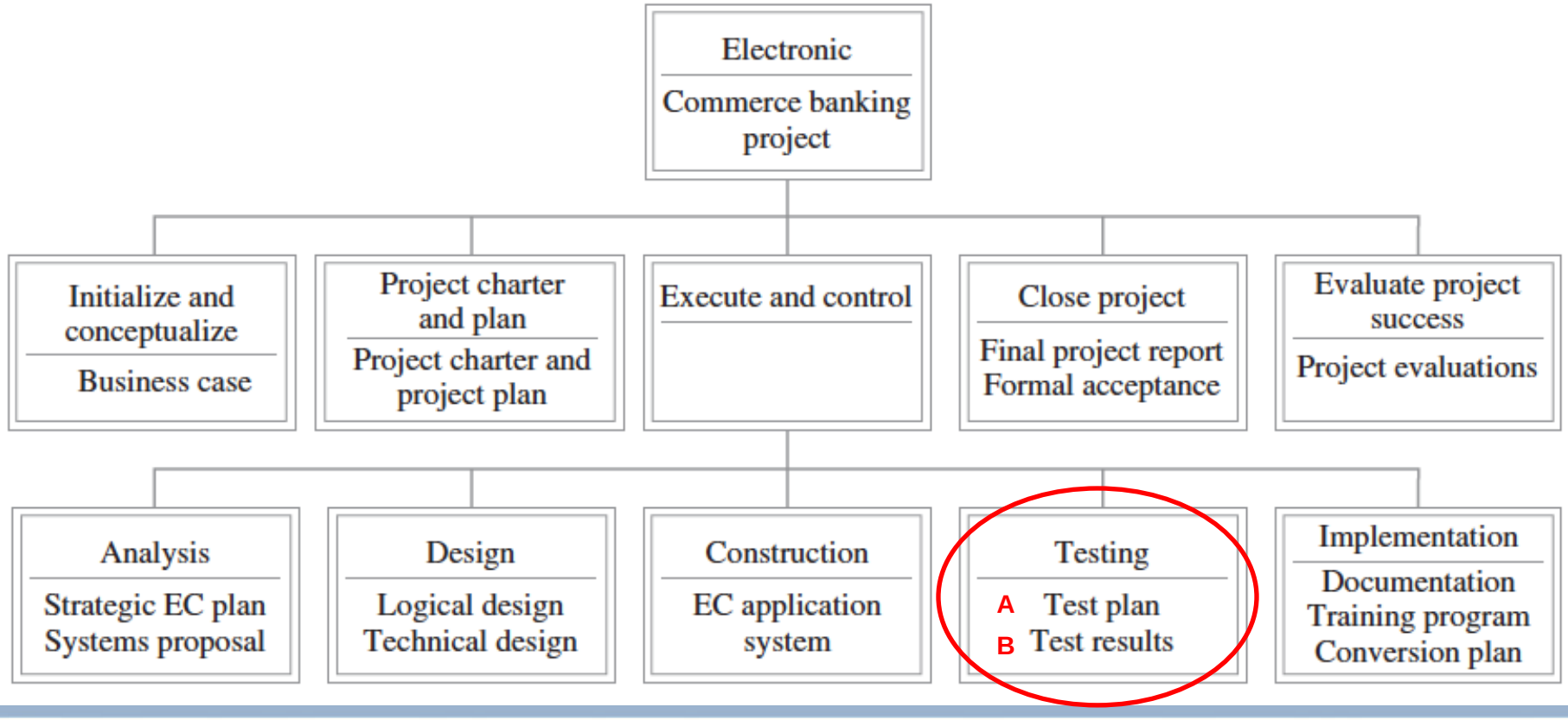


# Work Package



# Developing the WBS (Figure 5.4 repeated)

- A work package is developed for each of the phases and deliverables defined in the Deliverable Structure Chart (DSC)

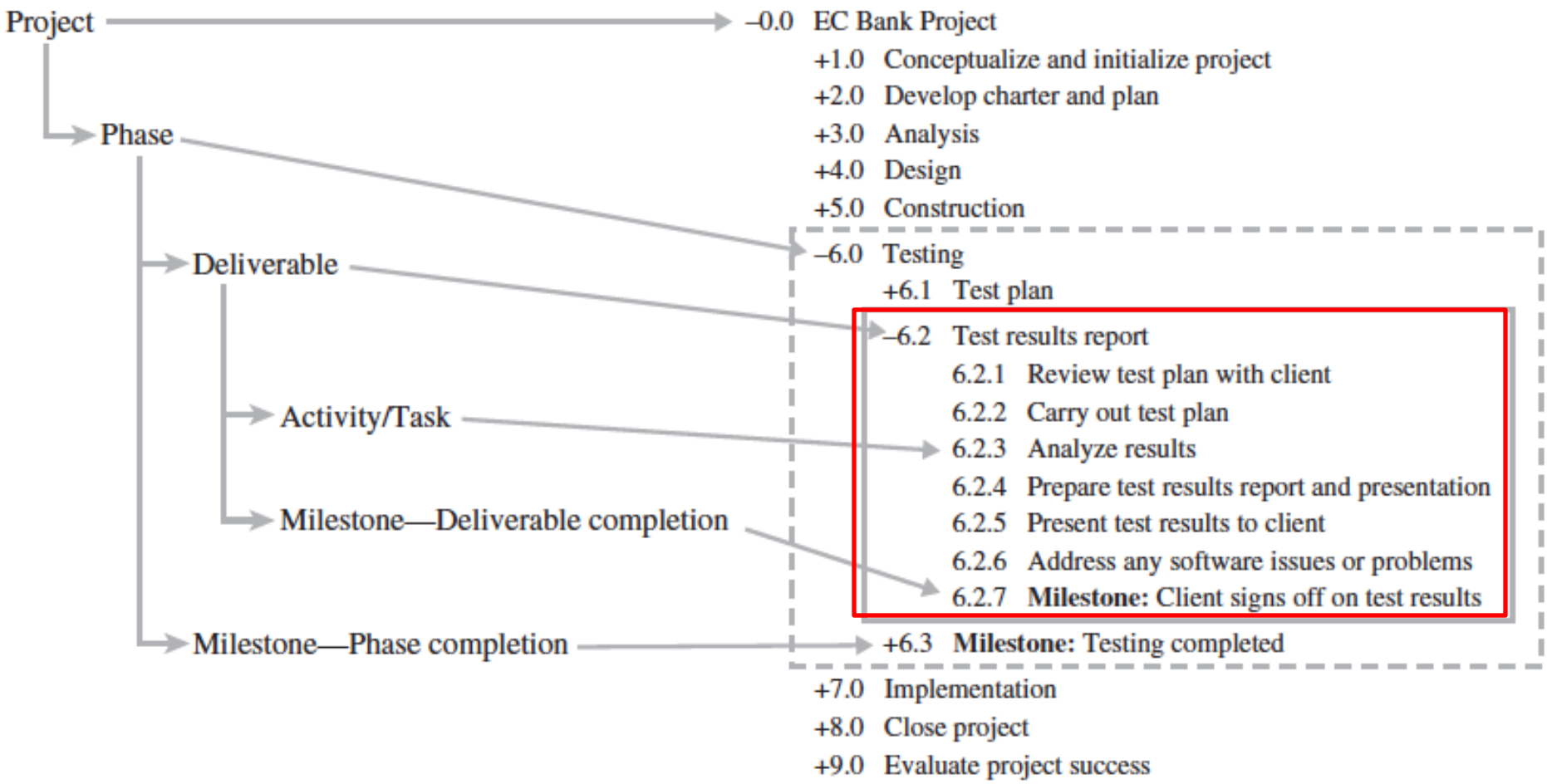


# Deliverable B: Test Results Report

- Logical Activities:
  1. Review the test plan with the client so that key stakeholders are clear as to what will be tested, how the tests will be conducted, and when the tests will be carried out.
  2. Conduct the tests as outlined in the plan.
  3. Once the test results are collected, we need to analyze them.
  4. The results should be summarized in the form of a report and presentation to the client.
  5. If all goes well, the client will sign-off or approve the test results and then we can move on to the implementation phase of the project.
  6. If not, then we need to address and fix any problems.

**What are the deliverables? Milestones?**

# Figure 5.9 – Work Package and Work Breakdown Structure



# Things to Keep in Mind When developing the WBS…

- Should support the project's MOV
- Should be "deliverable-oriented"
- The level of detail should support planning and control
- Developing the WBS should involve those who will be doing the work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# Estimation Questions

**What are you going to estimate?**

**Where do you start?**

**How do you estimate?**

# Estimation Techniques

- Guesstimating
- Delphi Technique
- Time Boxing
- Top-Down
- Bottom-Up
- Poker Planning


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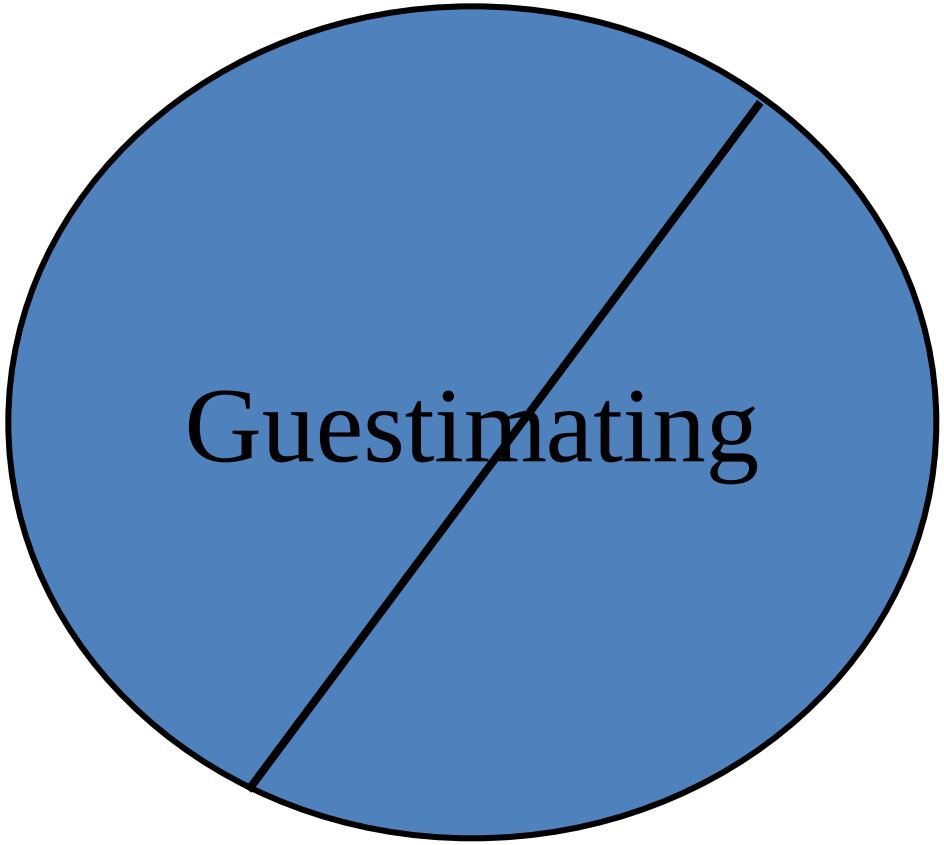


Estimation by guessing or just picking numbers out of the air is not the best way to derive a project's schedule and budget. Unfortunately, many inexperienced project managers tend to **guesstimate, or guess at the estimates**, because it is quick and easy.

# Delphi Technique

- Involves multiple, anonymous experts
- Each expert makes an estimate anonymously
- Estimates compared
  - If close, can be averaged
  - If not, discuss as a group first then do another iteration until a consensus is reached

# Time Boxing

- Often used on Agile projects (e.g., 2-week sprint)
- A "box" of time is allocated for a specific sprint, activity, task, or deliverable *(hard stop regardless if you finish or not)*
- Can focus a team if used effectively
- Can demoralize a team if not used effectively

# Top-Down

- Top & middle managers determine overall project schedule &/or cost (e.g., Divestiture – 3 months before business close the deal)
- Lower level managers are expected to breakdown schedule/budget estimates into specific activities (WBS)

# Bottom-Up

- Schedules & budgets are constructed from WBS
- Starts with people who will be doing the work
- Schedules & budgets are the aggregate of detailed activities & costs
- May use *analogous estimation* – developing estimates based on one's opinion that there is a significant similarity between the current project and others.
- What do you do if management says this is not fast enough?

# Poker Planning

- Focuses on “User Story”
- Uses a deck of cards that represents an estimate in days
  - E.g., Fibonacci Set: 1,2,3,5,8,13,21,34,55,… (also “Unsure” and “Take a Break” cards)
- Moderator describes particular task, feature, deliverable, or user story to be estimated.
  - Only people doing the work can participate. (Up to 10 players work the best)
- Players with lowest and highest cards need to justify
- Attempts to reach consensus in a few rounds of “play”

https://www.youtube.com/watch?v=MrIZMuvjTws (5 ½ min)

# Prepare for Next Class

- Read relevant parts of Chapter 5 for concepts that are not clear and bring any questions to next class.
- At-Home Assignment 2: MS Project Tutorial Set 2 Due May 25th
- Reminder:
  - Exam 1 – Saturday, May 21st @ 1:15pm EST

# Test Logistics

## Exam 1: Saturday, May 21st

- No Make-Up Test! (Any absence must receive excused absence approval from Office of Dean of Students Affairs)
- **Must Install Respondus Lockdown Browser prior to class!!!** (Look for "Lockdown Browser Install" on iCollege class page-assessment-quizzes)
- Test will start promptly at 1:15pm. (In order to be considerate of everyone's time, if you arrive later than 1:30pm, you will not be able to take the test.)
- Have a simple calculator (No smartphone allowed during exam)
- Open Book / Open Notes – No Collaboration with Others!

# Home Work

- Complete At-Home Assignment 1 (Due 5/21 class)
- Complete Team Assignment 3: Business Case (Due 5/21 class)
- Complete At-Home Assignment 2 (Due 5/25 class) – *New!*
- Start working on your team self-select project (Due 6/10 class)
  - Proposal due by 5/21 in dropbox (Proposal Only – 1 page max.)