



# **INFO 6245**

# **Planning &**

# **Managing**

# **Information**

# **Systems**

# **Development**

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Module 4

Project Scope Management

# Key Definitions

## Scope:

- All the work involved in creating the products of the project and the processes used to create them

## Deliverable:

- A product produced as part of a project, such as hardware or software, planning documents, or meeting minutes

## Requirement:

- A condition or capability that is necessary to be present in a product, service, or result to satisfy a business need

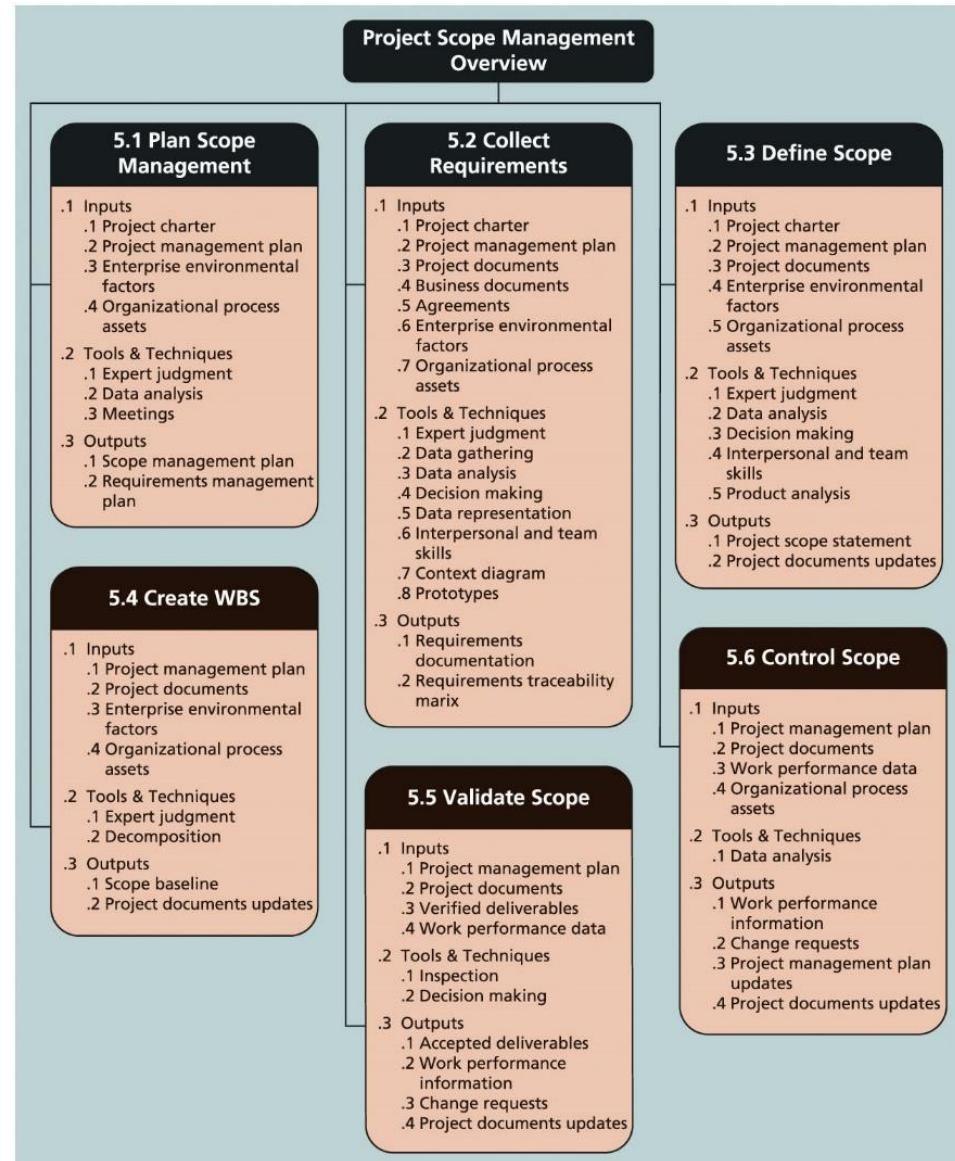
## Project scope management:

The processes involved in defining and controlling what is or is not included in a project.

Ensures that the project team and stakeholders have the same understanding of what products the project will produce and what processes the project team will use to produce them

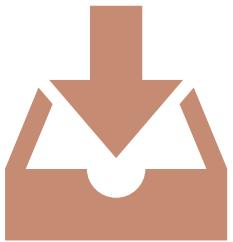
# PMI Summary

- Planning scope management:** determining how the project's scope and requirements will be managed
- Collecting requirements:** defining and documenting the features and functions of the products produced during the project as well as the processes used for creating them
- Defining scope:** reviewing the project charter, requirements documents, and organizational process assets to create a scope statement
- Creating the WBS:** subdividing the major project deliverables into smaller, more manageable components
- Validating scope:** formalizing acceptance of the project deliverables
- Controlling scope:** controlling changes to project scope throughout the life of the project



# Planning

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## Scope management plan

- Prepare a detailed project scope statement
- Create a WBS
- Maintain and approve the WBS
- Obtain formal acceptance of the completed project deliverables
- Control requests for changes to the project scope



## Requirements Management Plan

- Documents how project requirements will be analyzed, documented, and managed
- Plan, track, and report requirements activities
- Perform configuration management activities
- Prioritize requirements
- Product metrics
- Trace and capture attributes of requirements

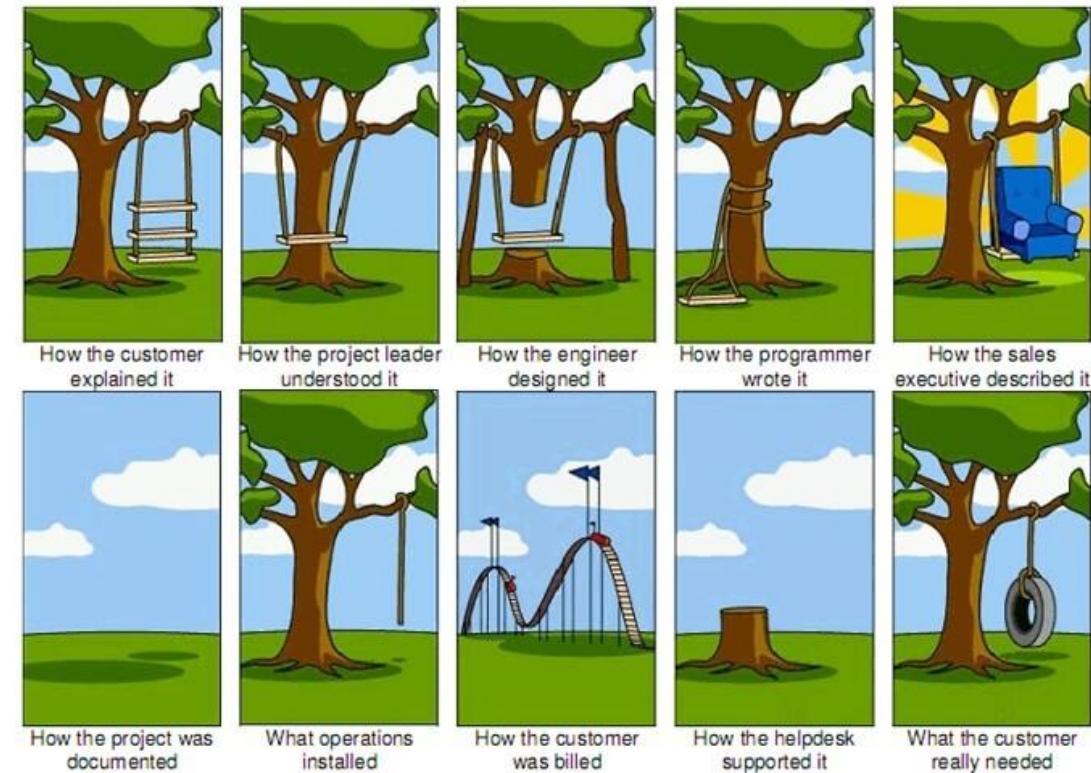
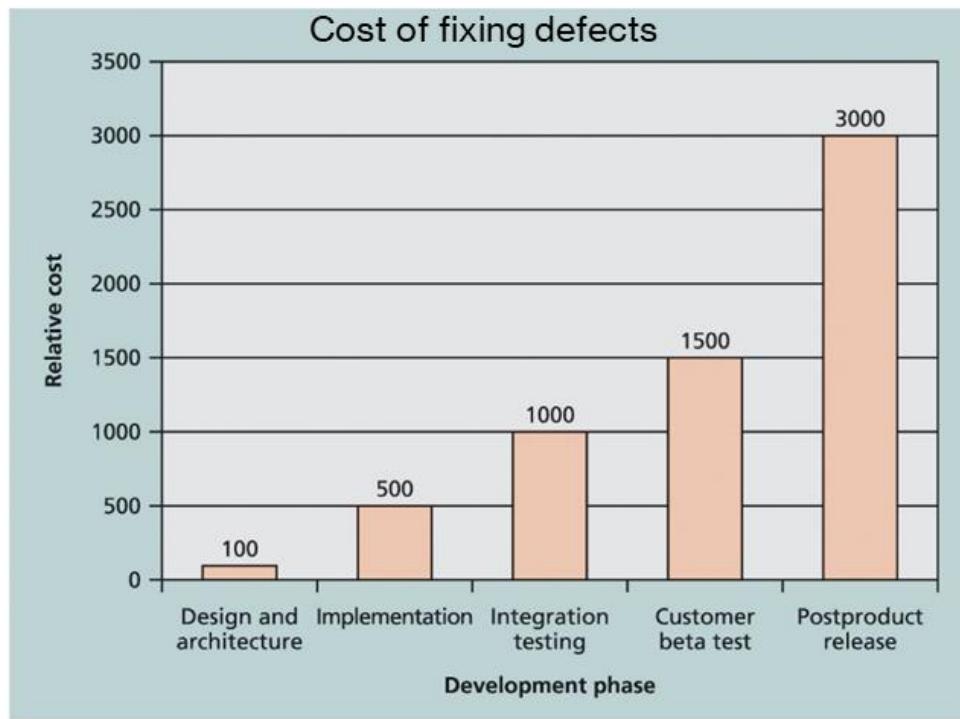


# Requirements Gathering

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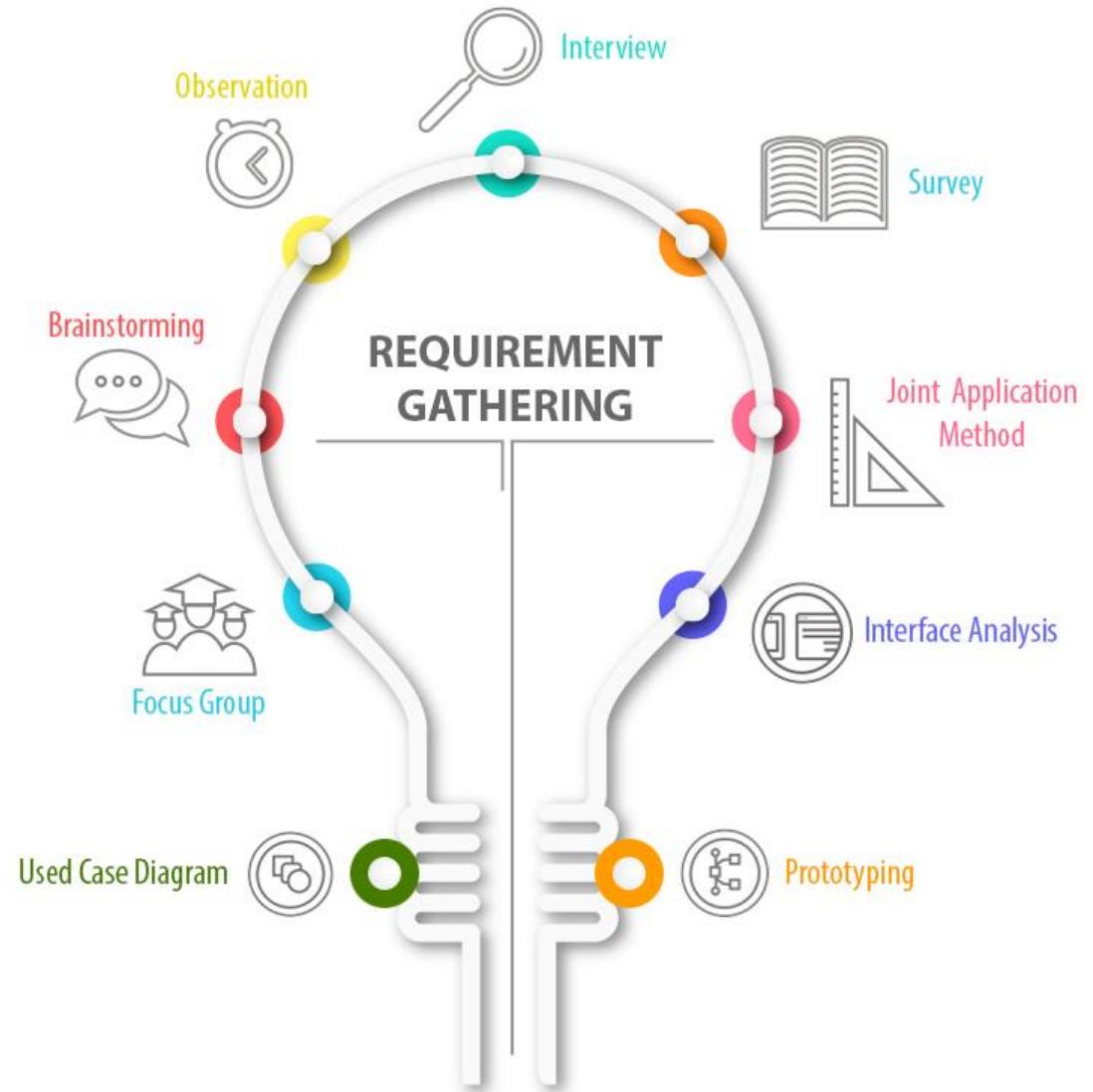
# Why is this important?

- A major consequence of not defining requirements well is rework
- Can consume up to half of project costs, especially for software development projects.
- It costs much more (up to 30 times more) to correct a software defect in later development phases than in the requirements phase

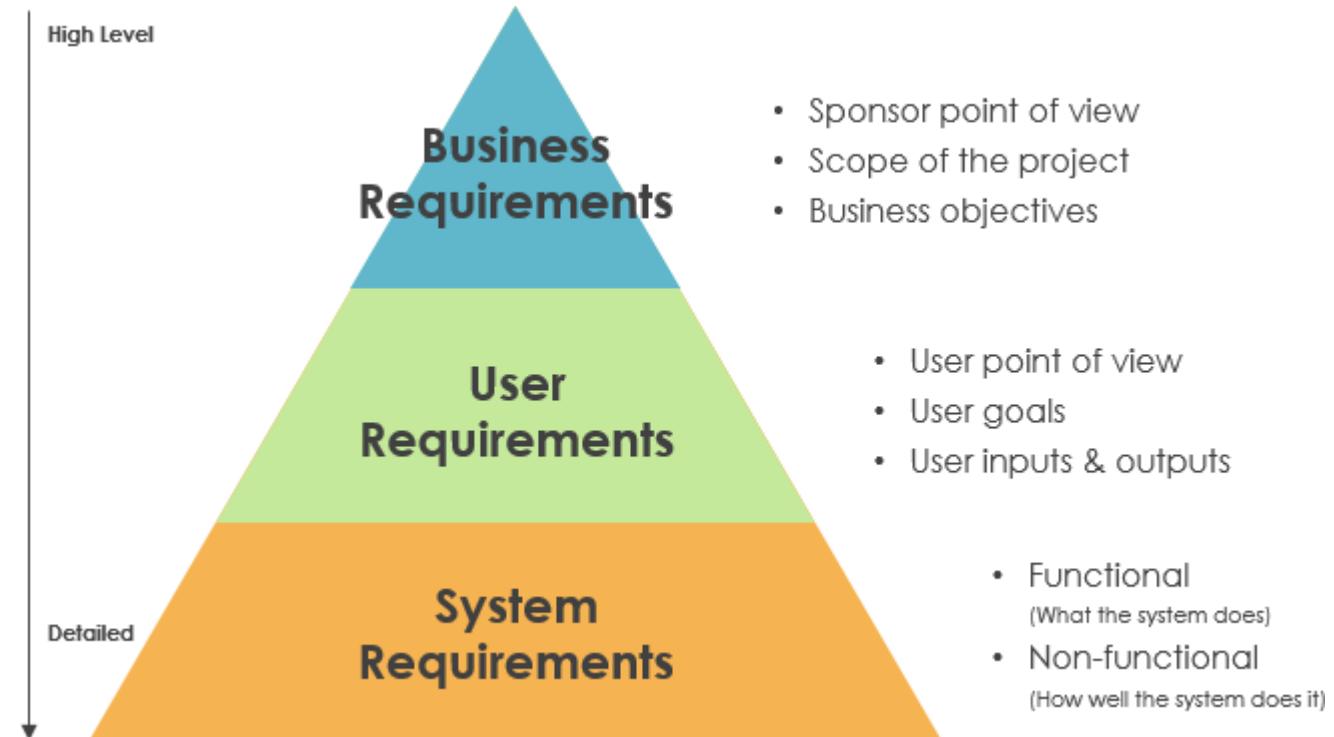


# Collecting Requirements

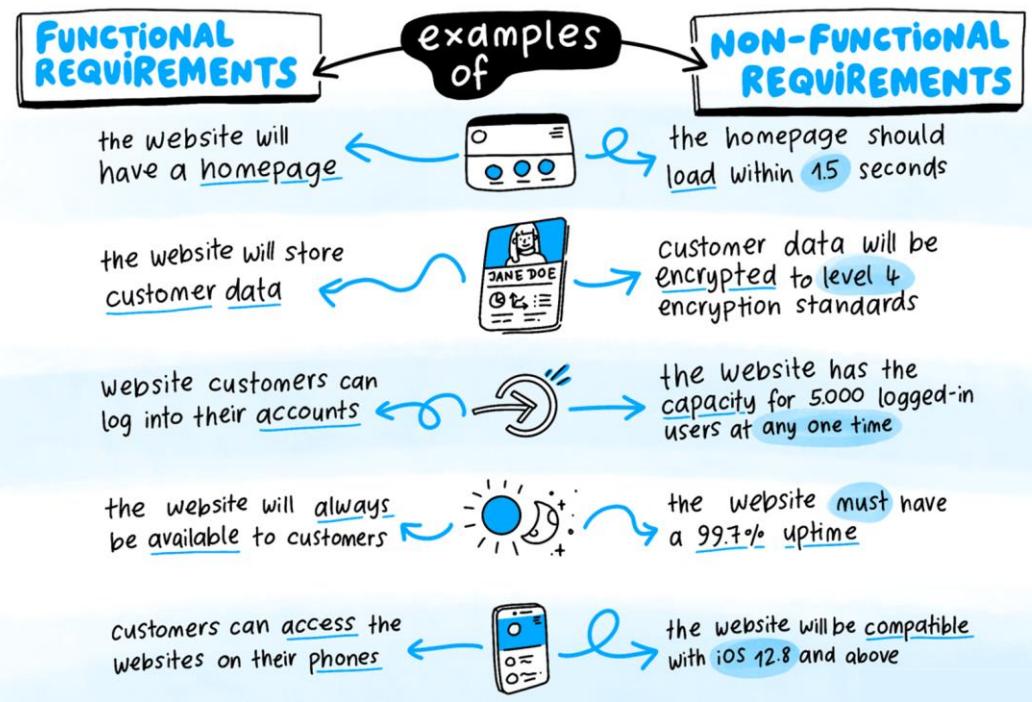
- Interviewing stakeholders
- Holding focus groups and facilitated workshops
- Using group creativity and decision-making techniques
- Utilizing questionnaires and surveys
- Conducting observation studies
- Benchmarking



# Levels of Requirements



# System-Level Requirements

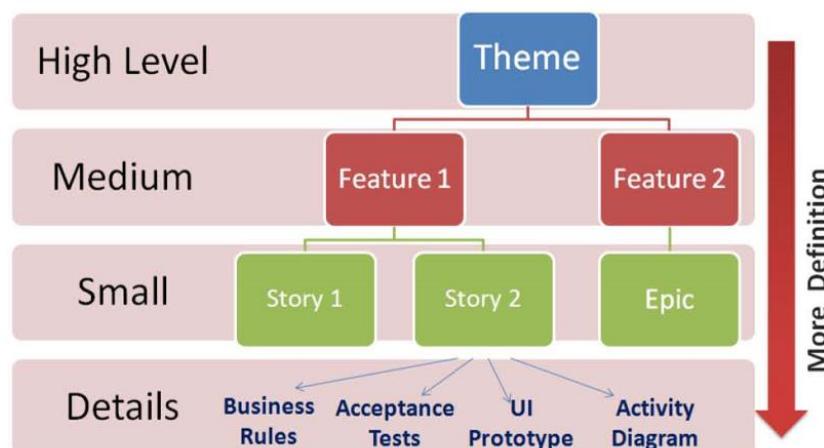
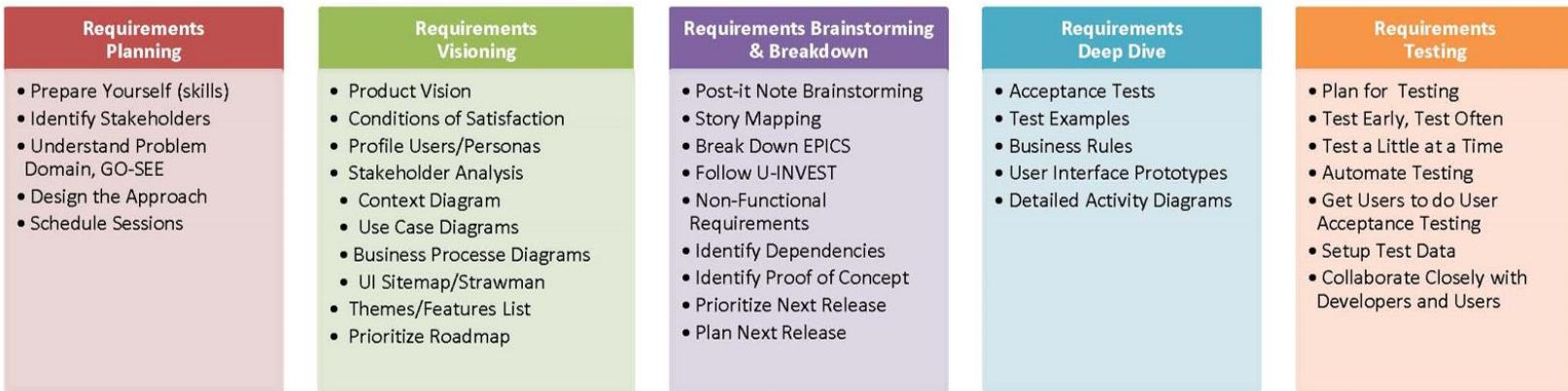


Requirements traceability matrix (RTM):

- A table that lists requirements, various attributes of each requirement, and the status of the requirements to ensure that all requirements are addressed

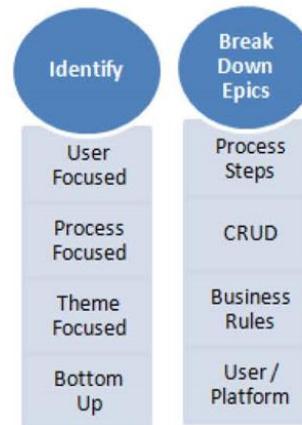
	The What	The How
Objective	Functional requirements	Nonfunctional requirements
End result	Describe what the product does	Describe how the product works
Focus	Define product features	Define product properties
Documentation	Focus on user requirements	Focus on user expectations
Essentiality	Captured in use case	Captured as a quality attribute
Origin type	They are mandatory	They are not mandatory, but desirable
Testing	Usually defined by user	Usually defined by developers or other tech experts
Types	Component, API, UI testing, etc. Tested before nonfunctional testing	Performance, usability, security testing, etc. Tested after functional testing
	External interface, authentication, authorization levels, business rules, etc.	Usability, reliability, scalability, performance, etc.

# Agile Requirements



## Attributes of a Story

- Understandable
- Independent
- Negotiable
- Valuable
- Estimatable
- Small
- Testable



## Requirements Gathering Process



# Define Scope

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# Defining Scope

- Good scope definition helps improve the accuracy of time, cost, and resource estimates
- Defines the baseline for performance measurement and project control
- Aids in communicating clear work responsibilities

## Inputs

- Project Vision
- Project Charter
- Project Management Plan
- Process Assets

## Tools & Techniques

- Expert Judgement
- Data Analysis
- Decision Making
- Interpersonal Skills
- Team Skills
- Product Analysis

## Outputs

- Project Scope Statement
- Updated project plans

## Product Scope Description

Model T is a low-cost electric vehicle with four doors, relatively high mileage, great durability, and a low-priced interior that can be upgraded. Gas-based cars are increasing pollution, and fuel is getting expensive. Low-cost electric cars will solve these problems and help protect the environment.

### Acceptance Criteria

1. The Car should run to 300km on a full charge battery
2. Low service costs
3. Low financing options from all major institutions
4. Upgrade options
5. High durability
6. Two-year warranty for external and internal parts
7. The car should achieve 110 km/hours within 10 seconds

### Deliverables

1. One electric vehicle
2. One full car battery warranty
3. One spare wheel
4. One front airbag
5. Back and front leather seat covers

### Project Exclusions

1. Free spare battery
2. Free charging cables
3. Extra coolant or any spare parts
4. No insurance policies
5. No free service

### Constraints

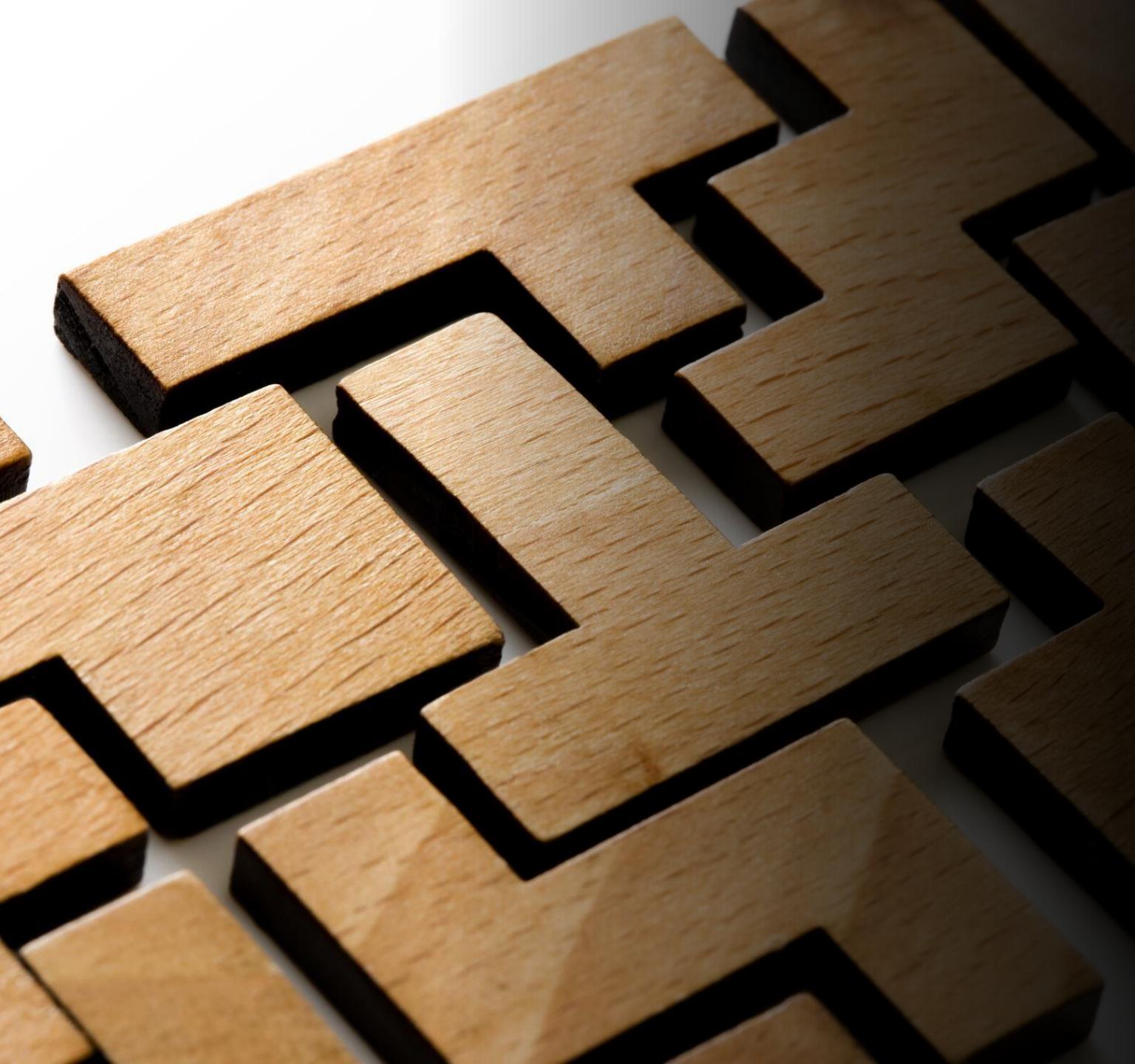
1. COVID-19 may affect demand
2. The car should be launched by fall 2021
3. Budget
4. Time/resources/personnel limitations
5. Project team members will be backfilled as necessary
6. Funding for recommended and approved changes will be provided

### Assumptions

1. All raw materials will be available
2. All semiconductor chips will be available
3. Permanent staff will not be reassigned
4. Funding will be available when required

# Scope Statement

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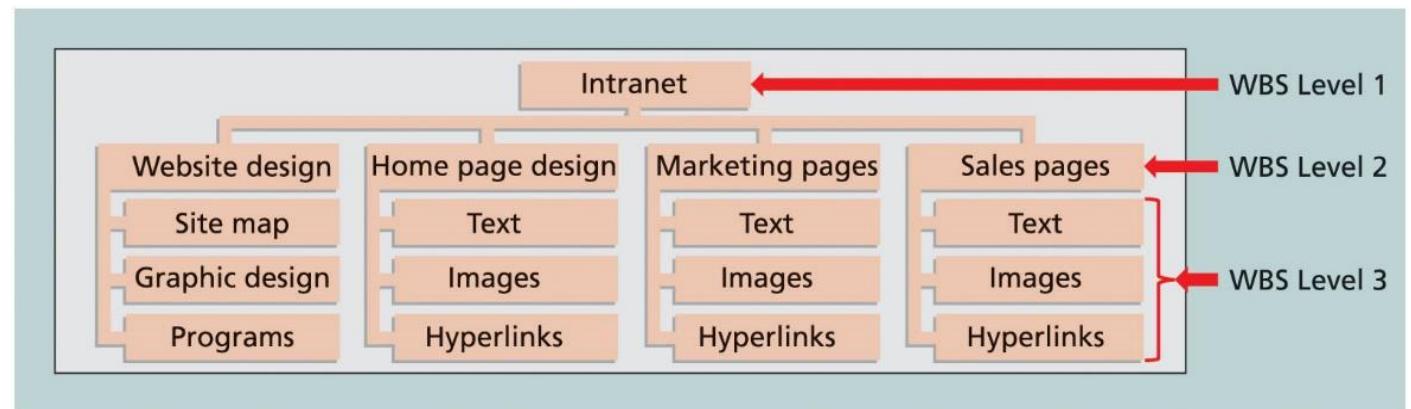
# Work Breakdown Structure

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A deliverable-oriented grouping of the work involved in a project that defines its total scope

# Creating the WBS

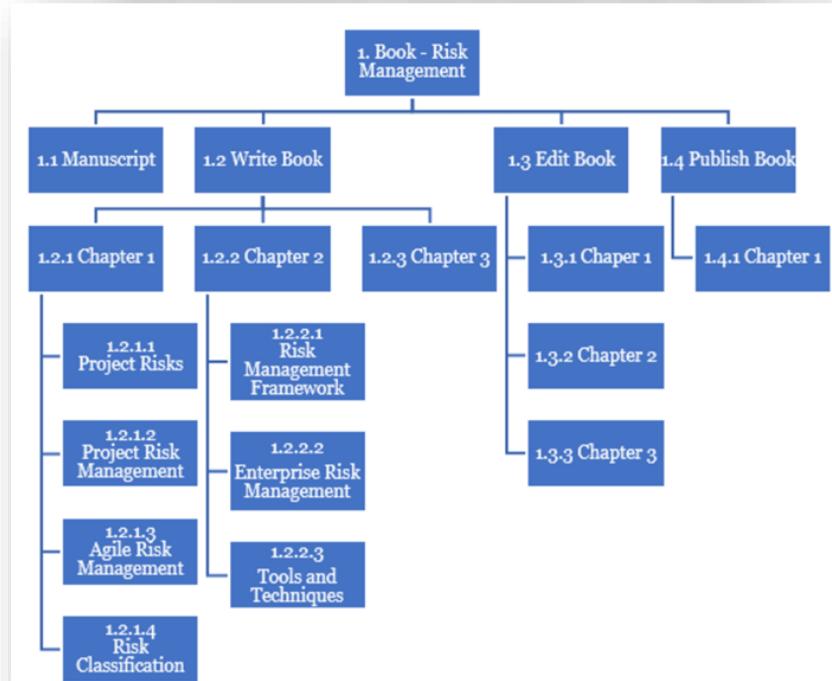
- Work Breakdown Structure (WBS) is a deliverable-oriented grouping of the work involved in a project that defines the total scope of the project
  - Foundation document that provides the basis for planning and managing project schedules, costs, resources, and changes
- Decomposition is the main tool or technique for creating a WBS
  - Subdividing project deliverables into smaller pieces
  - A work package is a task at the lowest level of the WBS
- Outputs of creating the WBS are the scope baseline and project documents updates
  - Scope baseline includes the approved project scope statement and its associated WBS and WBS dictionary



# WBS in Agile Projects

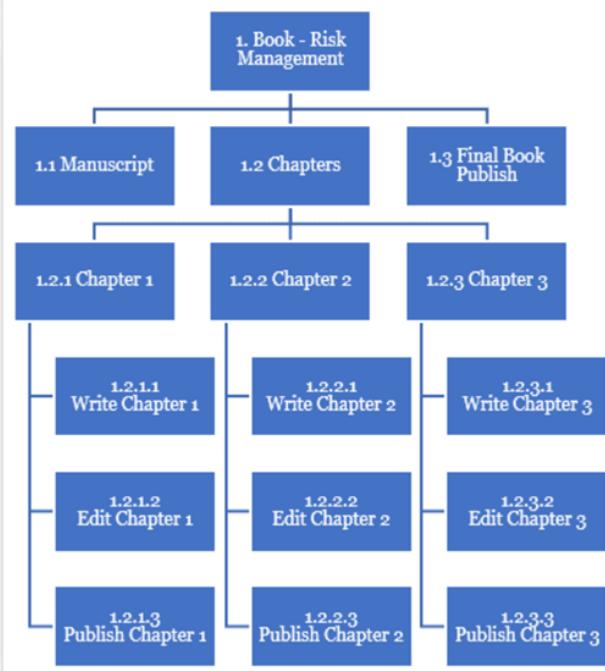
## Predictive:

Work estimated for delivering the entire book



## Iterative:

Work broken down to delivering each chapter

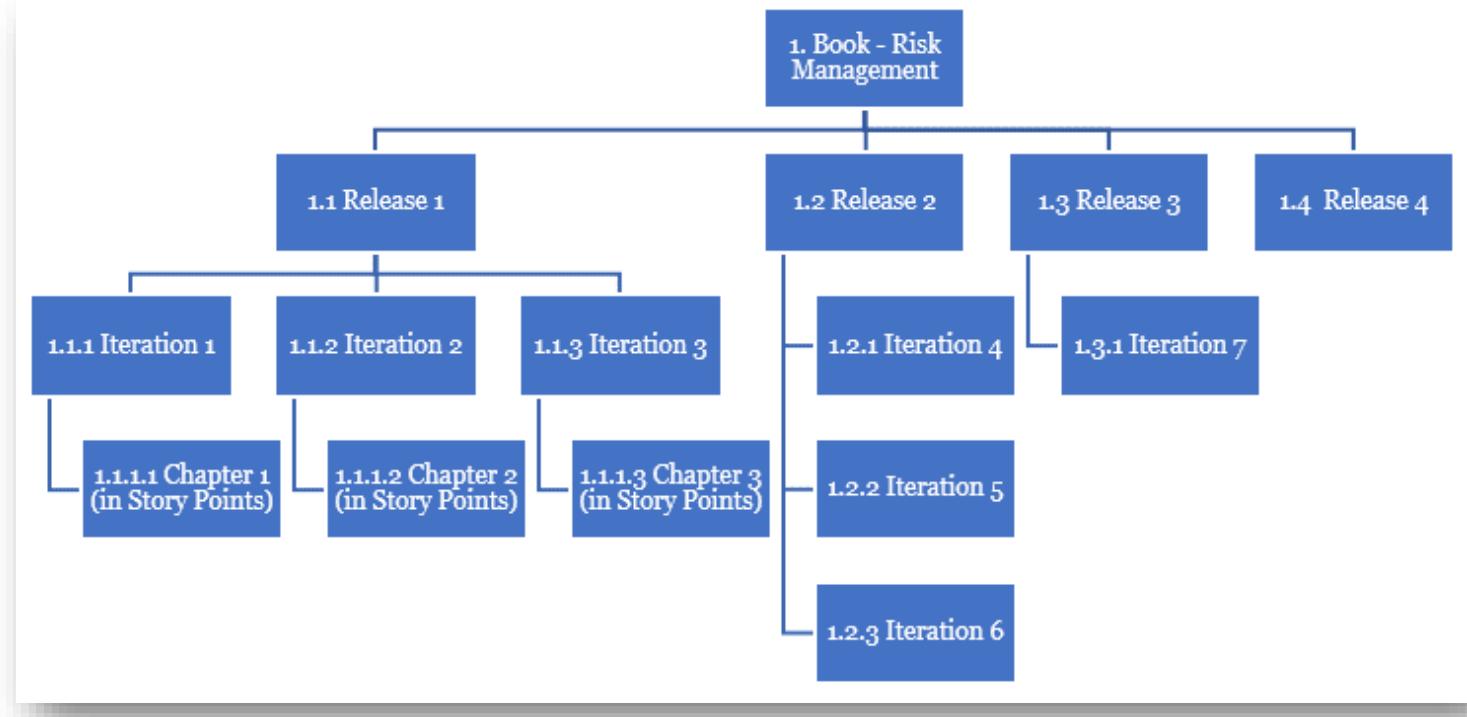


# **WBS for Large Integrated Development**



# Agile Product Backlog

- Each Release can contain all stages of development for that chunk of scope
- Within each iteration, Stories can contain the research, design, and development/coding for each chapter.
- Delivery can be grouped based on MVP
  - E.g., Chapters 1, 2, & 3 can be your MVP delivery to secure a publishing house for the entire book



# WBS Creating Approaches

- Approaches to developing work breakdown structures
  - **Using guidelines:** Some organizations, like the U.S. Department of Defense (DOD), provide guidelines for preparing WBSs
  - **Analogy approach:** Review WBSs of similar projects and tailor to your project
  - **Top-down approach:** Start with the largest items of the project and break them down
  - **Bottom-up approach:** Start with the specific tasks
  - **Mind mapping:** Uses branches radiating out from a core idea to structure thoughts and ideas



# Validating Scope

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# Scope Validation

- It is difficult to create a good project scope statement and WBS for a project
  - Even more difficult, especially on IT projects, to verify the project scope and minimize scope changes
- Even when the project scope is fairly well defined, many IT projects suffer from scope creep
  - Tendency for project scope to keep getting bigger and bigger
- Scope validation involves formal acceptance of the completed project deliverables
  - Acceptance is often achieved by a customer inspection and then sign-off on key deliverables



# Controlling Scope

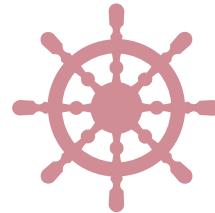
# Scope Control

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**Scope control involves controlling changes to the project scope**

Keeping project goals and business strategy in mind



**Goals of scope control**

Influence the factors that cause scope changes  
Ensure changes are processed according to procedures developed as part of integrated change control  
Manage changes when they occur



**Variance is the difference between planned and actual performance**

# Improving User Inputs

- Develop a good project selection process and insist that sponsors are from the user organization
- Place users on the project team
- Conduct regular meetings with defined agendas
- Deliver something to users and sponsors on a regular basis
- Do not promise to deliver what the team cannot deliver in a particular time frame
- Locate users with the developers



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# Improving Requirements Management

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- Develop and follow a requirements management process
- Employ techniques such as prototyping, use case modeling, and JAD to get more user involvement
- Put requirements in writing and keep them current
- Create a requirements management database for documenting and controlling requirements
- Provide adequate testing and conduct it throughout the project life cycle
- Review changes from a systems perspective
- Emphasize completion dates to help focus on what's most important
- Allocate resources specifically for handling change requests

# In-Class Group Exercise



# Create a WBS for your Project

1. Identify your deliverables
2. Map out your Functions, Features, Requirements, & Activities
3. Fill out the template provided (table & chart)
4. For this exercise, only breakdown for 2-3 Features up to 2-3 iterations (small chunk out of overall scope)
5. Submit on Discussion Board associated with Module 4

Project Name:		xyz example	
Deliverable:		User-Friendly Website	
Unique ID	WBS Level	Breakdown	
1	Release 1	User friendly landing Page	
1.1	Feature 1	Headline Section	
1.1.1	Story/Task 1	Create Content for Heading and Body	
1.1.2	Story/Task 2	Add image from approved image library	
1.2	Feature 2	Filtered Search	
1.2.1	Story/Task 1	Add pop-up search bar on to	
1.2.2	Story/Task 2	Display filter icons on the search bar	
1.3	Feature 3	Social Media Links	
1.3.1	Story/Task 1	Create social media icons	
1.3.2	Story/Task 2	Add links to social media accounts	
2	Release 2	About Us Page	
2.1	Feature 1	Introduction Section	
2.1.1	Story/Task 1		



# Assignment





# ASSN#3

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- ASSN#3: Chapter 5, Exercise 1, Page 236
- You are working on a project to develop a new or enhanced system to help people at your college, university, or organization to find jobs.
- The system must be tailored to your student or work population and be very easy to use.
- Write a short paper describing how you would collect requirements for this system and include at least five requirements in a requirements traceability matrix.