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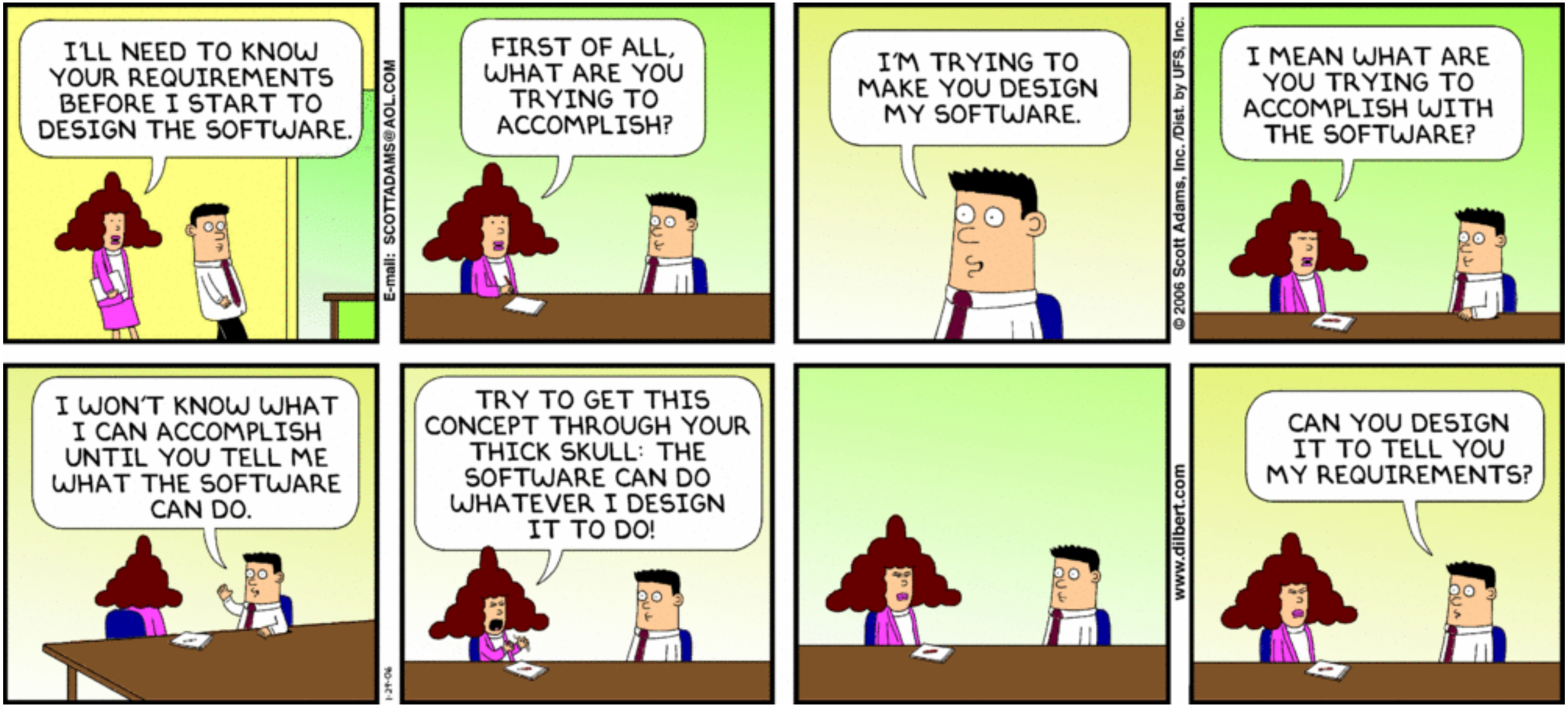
Requirements planning in the DevOps cycle

Software Engineering

2025/2026

Summary

- User stories
  - Good practices
  - Acceptance criteria
  - Epics
  - Initiatives
- Estimation
  - Story points
  - Poker planning
  - Story points vs. hours
- Requirements
  - Functional
  - Non-functional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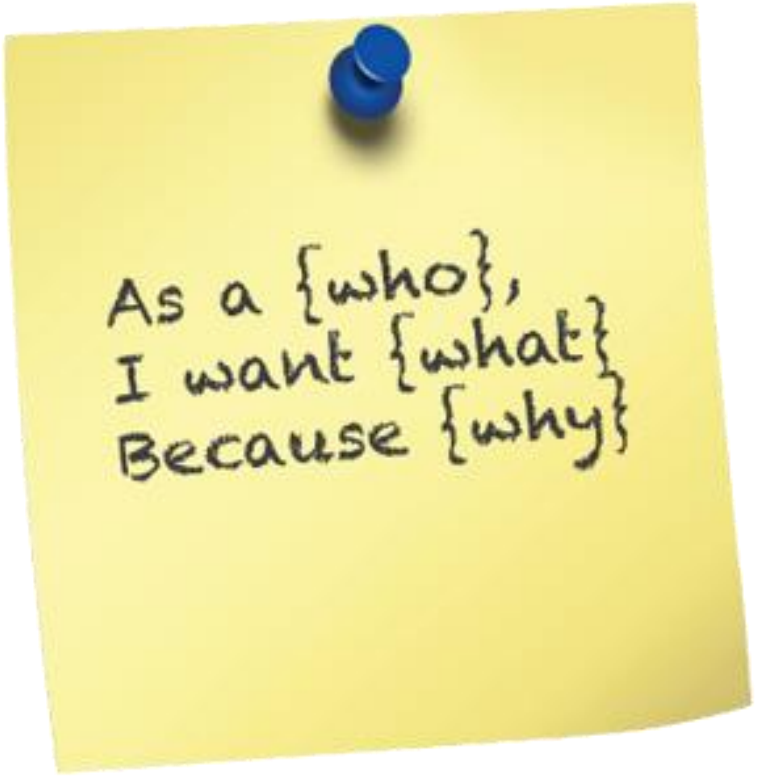
User stories

User story

- A user story is a key tool in agile software development that captures a feature from the end-user's perspective.
- It identifies **who** the user is, **what** they want, and **why** they need it.
- By focusing on the user's needs, a user story provides a clear and simplified description of a requirement.



User story

Definition

- A user story often follows the following “equation”:

  As a ‹type of user>, I want < some feature> so that ‹reason>

- A simple example of this could be:

  As a **customer**, I want **to add an item to my cart**,

  so that **I can purchase it**

User story

Template

WHO are we creating it for? Who is the user?	**As a <type of user>**
WHAT are we creating? What is the intention?	**I want <some objective>**
WHY are we creating it? What is the value for the customer?	**So that <benefits>**

User story

Checklist

- ❑ Keep it short
- ❑ Keep it simple
- ❑ Write from the user's perspective
- ❑ Highlight the value or benefit
- ❑ Focus on a single functionality (split if needed)
- ❑ Write stories collaboratively
- ❑ Define acceptance criteria to outline the MVP

Acceptance criteria

- Acceptance criteria (or "conditions of satisfaction") define the detailed scope of a user's requirements.
  - They clarify the value of the story, align the team on expectations, and establish when the work can be considered complete.

- Goals
  - Clarify what the team should build before starting work
  - Ensure a shared understanding of the problem
  - Define when the story is complete
  - Enable verification through automated tests

Acceptance criteria

Example

- User Story:
  - As a registered user, I want to reset my password so that I can regain access to my account.

- Acceptance Criteria:
  - User receives a password reset link via email
  - The link expires after 24 hours
  - The new password must meet security requirements
  - A confirmation message is shown after successful reset

It can be seen as the "Definition of Done" within Agile methodology.

Acceptance criteria

Template

- Given–When–Then (BDD style)
  - **Given** some initial context
  - **When** the user takes an action
  - **Then** the expected outcome occurs

- Example:
  - Given a registered user requests a password reset,
  - When they submit their email address on the “Forgot Password” page,
  - Then they receive a password reset link via email.

Acceptance criteria

Template

- Given–When–Then (BDD style)
  - **Given** some initial context
  - **When** the user takes an action
  - **Then** the expected outcome occurs

- Checklist style:

  User receives a password reset link via email

VS

- Example:
  - Given a registered user requests a password reset,
  - When they submit their email address on the “Forgot Password” page,
  - Then they receive a password reset link via email.

- The Given–When–Then style works well for automated tests
  - while the **checklist style** is simple and quick for teams.

Acceptance criteria

What your checklist should cover

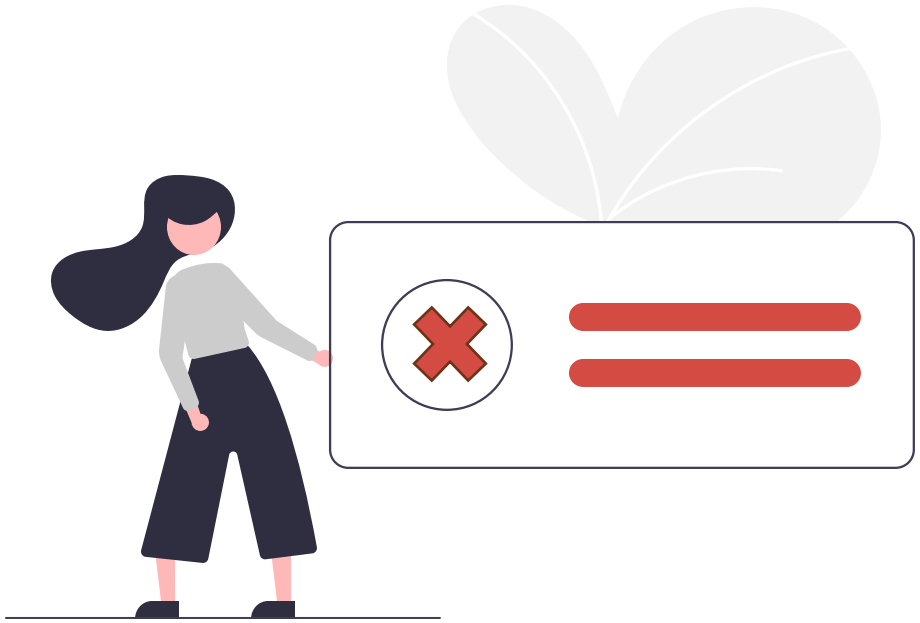
- ❑ Negative scenarios of the functionality
- ❑ Functional and non-functional use cases
- ❑ Performance concerns and guidelines
- ❑ What system/feature intends to do
- ❑ End-to-user flow
- ❑ The impact of a user story to other features
- ❑ UX concerns

Acceptance criteria

What your checklist should not include

- ❑ Code review was done
- ❑ Non-blocker or major issues
- ❑ Performance testing performed
- ❑ Acceptance and functional testing done

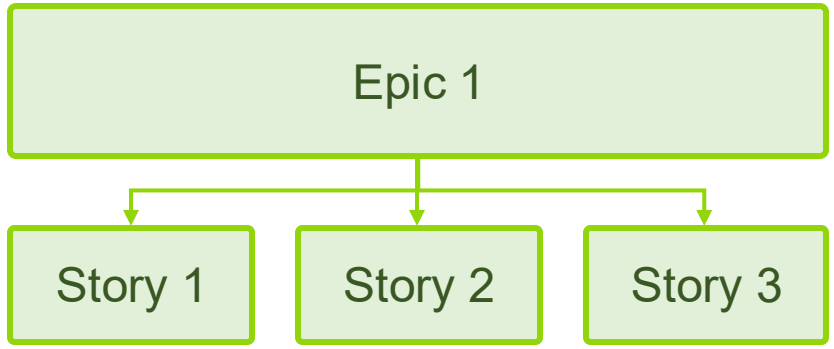
- ➢ The team should already share a clear understanding of the DoD



Epics

Definition

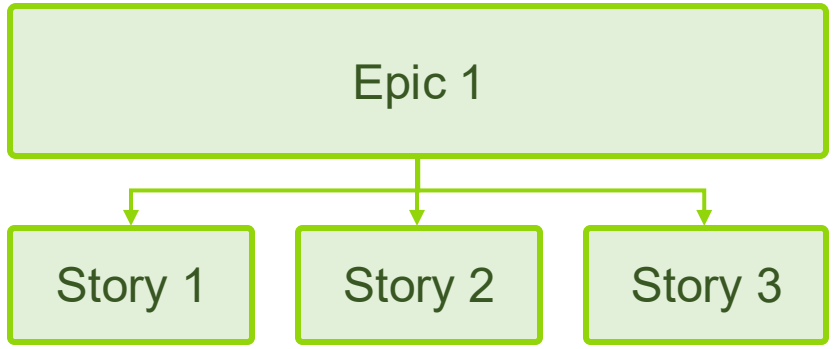
- A large user story that can’t be completed in a single sprint.
- Represents a significant feature or initiative.
- Can be broken down into smaller, manageable user stories.



Epics

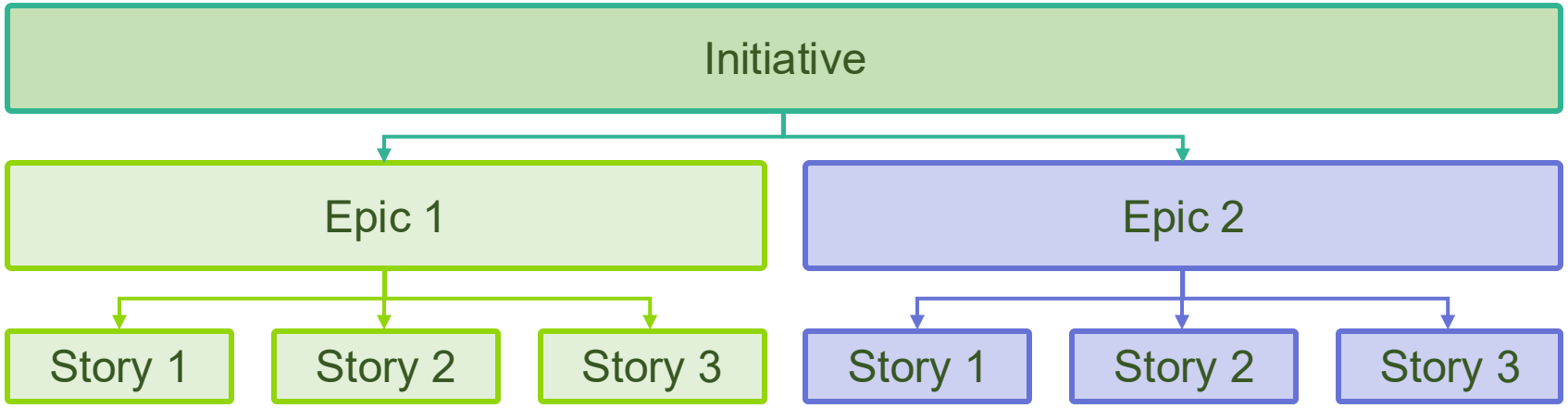
Characteristics

- Covers a broad scope and multiple teams or sprints.
- Focuses on a bigger business goal rather than technical details.
- Serves as a container for related user stories.
- Managing epics
  - Break epics into smaller stories for easier planning.
  - Adjust scope as priorities and requirements evolve.



Initiatives

- A high-level objective that aligns with strategic business goals.
- Larger than an epic and often spans multiple epics.
  - Focuses on outcomes, not just features.
- Drives multiple epics across teams or departments.



Estimation

Estimation

- Estimation is a forecast — much like predicting the weather.
  - It can be right or wrong due to both *known unknowns* and *unknown unknowns*.

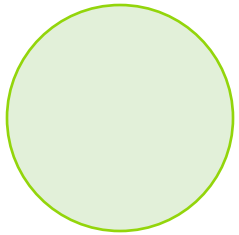
Estimation

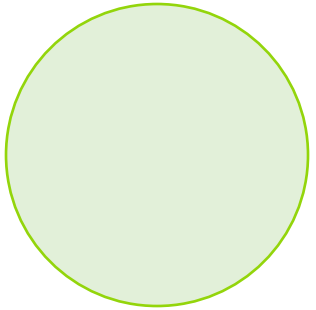
Challenges

- Humans often struggle to accurately estimate values.

- We often confuse an item's proportional worth with its exact worth.
  - While a 50% discount feels significant, the absolute value of the item might still be more than you should pay.

- We struggle to estimate the value of something we have little to no experience with.
  - A seasoned contractor can give a far more accurate estimate for a renovation project than a homeowner who has never done one before.



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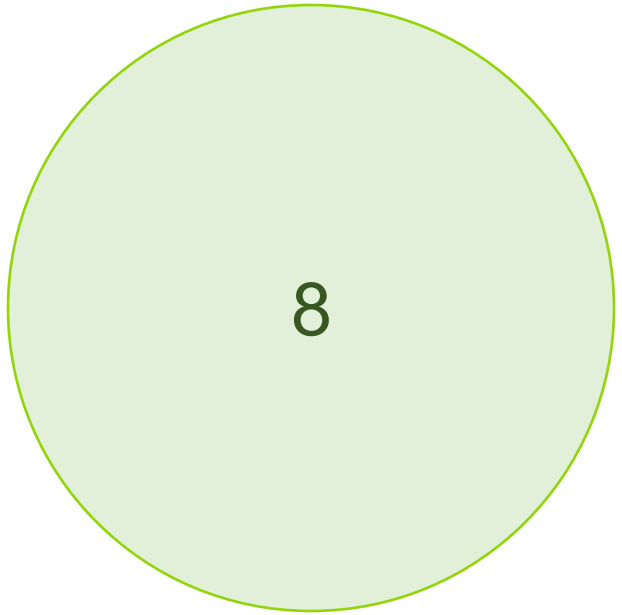
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Story points

- A Story Point (SP) is a relative unit of measure.
  - Used by Scrum teams to estimate the effort required to complete a requirement.
- Estimates are not absolute time but relative comparisons (e.g., one story is twice as complex as another).
  - Teams define their own scale (e.g., Fibonacci sequence: 1, 2, 3, 5, 8, …).
- Helps in planning, forecasting, and measuring team velocity.

Planning poker

- Consensus-based estimating technique used in Agile teams.
  - Can be applied with Story Points, Ideal Days, or any other estimating unit.

- Process:
  1. Product Owner presents the story.
  2. Each team member selects a card privately.
  3. All cards are revealed simultaneously.

Planning poker

- It's crucial that everyone participates in the estimation process.
  - Developers, designers, testers, deployers
  - Estimates are most accurate when made by the people who will actually do the work.
- Discuss differences → repeat until consensus is reached.
- Encourages collaboration, shared understanding, and avoids anchoring bias.

Story points vs. hours

- Developers feel pressure to match the estimated hours exactly.
- Exceeding the estimate may suggest poor performance.
- Finishing under the estimate may indicate a flawed original estimate.
- Advantages of story points:
  - Estimates are independent of the estimator's skills or experience.
  - Team velocity is tracked over time.
  - No need to re-estimate if the team's capacity changes.

Requirements

Requirements

What is a requirement?

- Detailed specifications that describe what the system must do
- Can be functional (features, behaviour) or non-functional (performance, security)
- Serve as input for design, development, and testing
- Stories are important!
  - But they are too high-level for developers to implement directly

Requirements

Requirements of requirements

- Clear and Unambiguous
  - Every requirement should have a single, precise meaning.
- Testable
  - Must be possible to verify through inspection, demonstration, or testing.
- Complete
  - Covers all necessary functionality and constraints.
- Consistent
  - Does not conflict with other requirements.
- Feasible
  - Can realistically be implemented within time, budget, and technology constraints.
- Traceable
  - Linked to its source, e.g., user story, epic, or business objective.

Requirements

Functional Requirements (FR)

- These define specific actions or behaviours of a system.
  - They directly support business processes and user tasks.

- Examples:
  - System logic:
    - The system shall calculate the tax based on the user's location and the current tax rate.
  - User interaction:
    - A user shall be able to log in using a unique email and password.
  - Data handling:
    - The system shall store a complete history of all user orders for a minimum of 7 years.
  - API/Integration:
    - The system shall expose a RESTful API endpoint to retrieve product data.

Requirements

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Requirements

Non-Functional Requirements (NFR)

- Non-Functional Requirements **directly impact architectural decisions**, technology stack choices, and testing strategies.

→ The system shall support scalability

Or

→ The system shall be secure

These are not

Non-Functional Requirements

Requirements

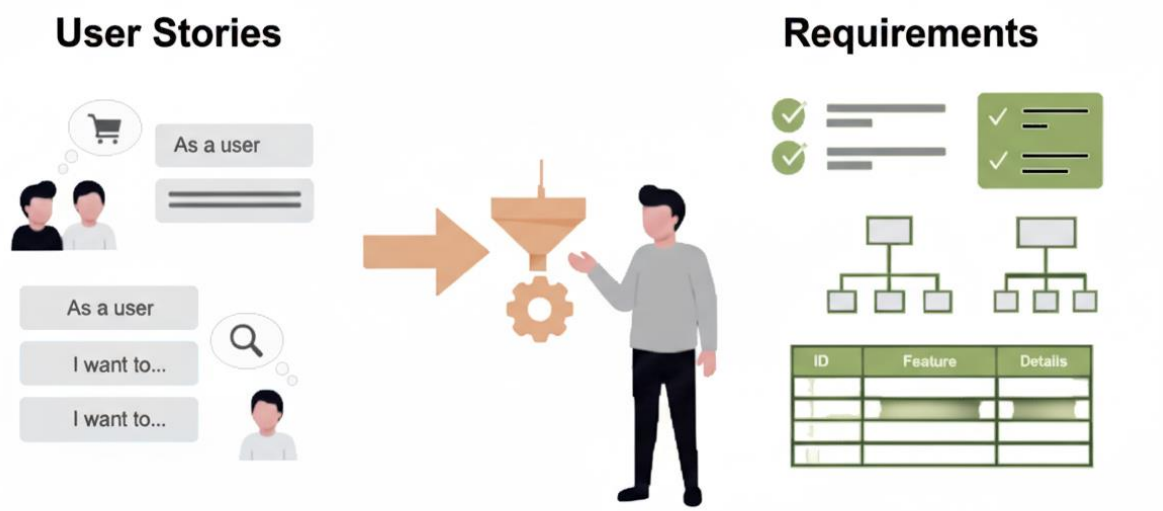
Non-Functional Requirements (NFR)

- Scalability:
  - The system shall support 10,000 concurrent users without a noticeable degradation in performance.
- Performance:
  - The user's dashboard shall load in less than 2 seconds.
- Security:
  - All user authentication data shall be encrypted at rest and in transit using industry-standard protocols.
- Maintainability:
  - The codebase shall adhere to a clean architecture and be easily extensible by new team members.
- Reliability:
  - The system shall have an uptime of 99.99%.
- Usability:
  - The checkout process shall require a maximum of three clicks.

Requirements

Convert user stories into requirements

- Review the user story and its context
- Identify functional needs
  - What the system must do
- Identify non-functional needs
  - Performance, security, usability
- **Define acceptance criteria**
- Document in a testable format



Requirements

Convert user stories into requirements

- User Story:

  As a registered user,
  I want to update my profile information,
  so that my details are always current.

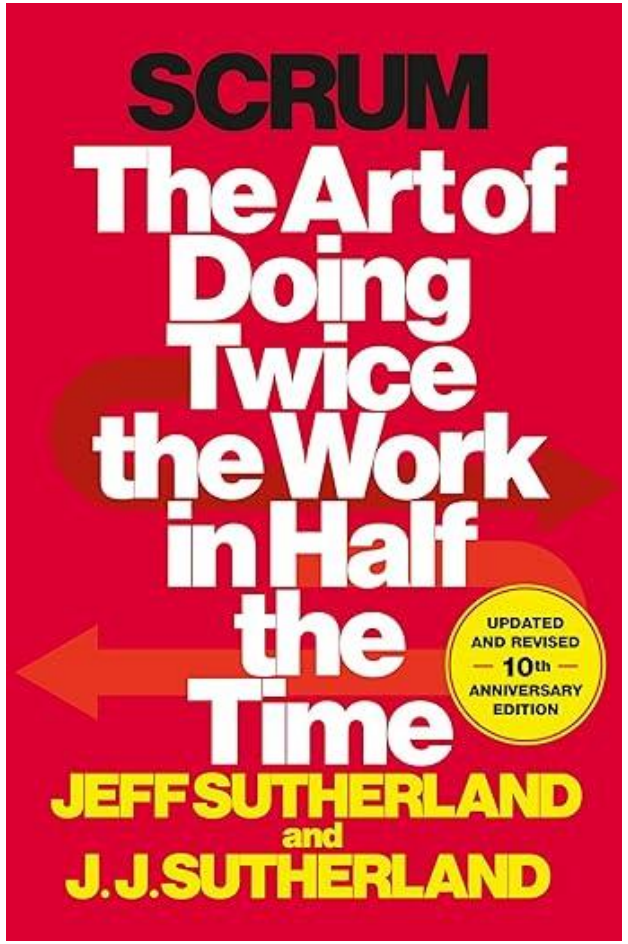
- Step 1: Breakdown into Functional Requirements (FRs)
  - FR-1: The user shall be able to view their current profile information on a dedicated page.
  - FR-2: The system shall provide input fields for the user's name, email, and password.
  - FR-3: The user shall be able to save changes to their profile by clicking a "Save" button.
  - FR-4: The system shall validate all input fields upon submission and display an error message for invalid data.
  - FR-5: The system shall display a success message upon successful update of the profile.

Requirements

Convert user stories into requirements

- Step 2: Identify Non-Functional Requirements (NFRs)
  - NFR-1 (Security): Password updates shall require the user to re-enter their current password for verification.
  - NFR-2 (Performance): The profile page shall load in less than 1 second. The profile update operation shall complete in under 500ms.
  - NFR-3 (Usability): Input fields shall be clearly labelled and provide clear instructions.

References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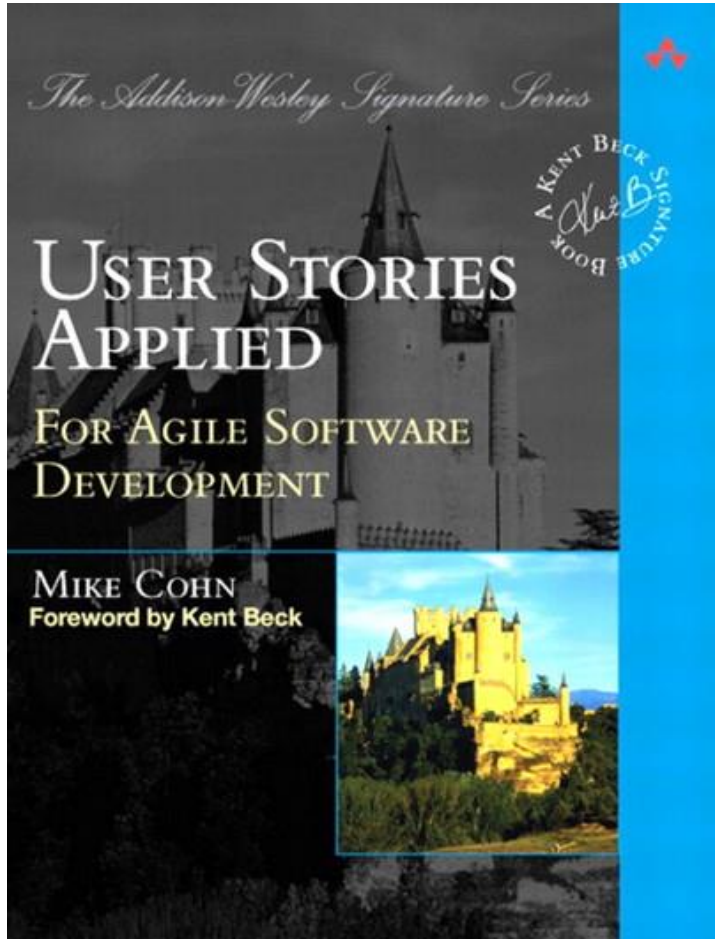
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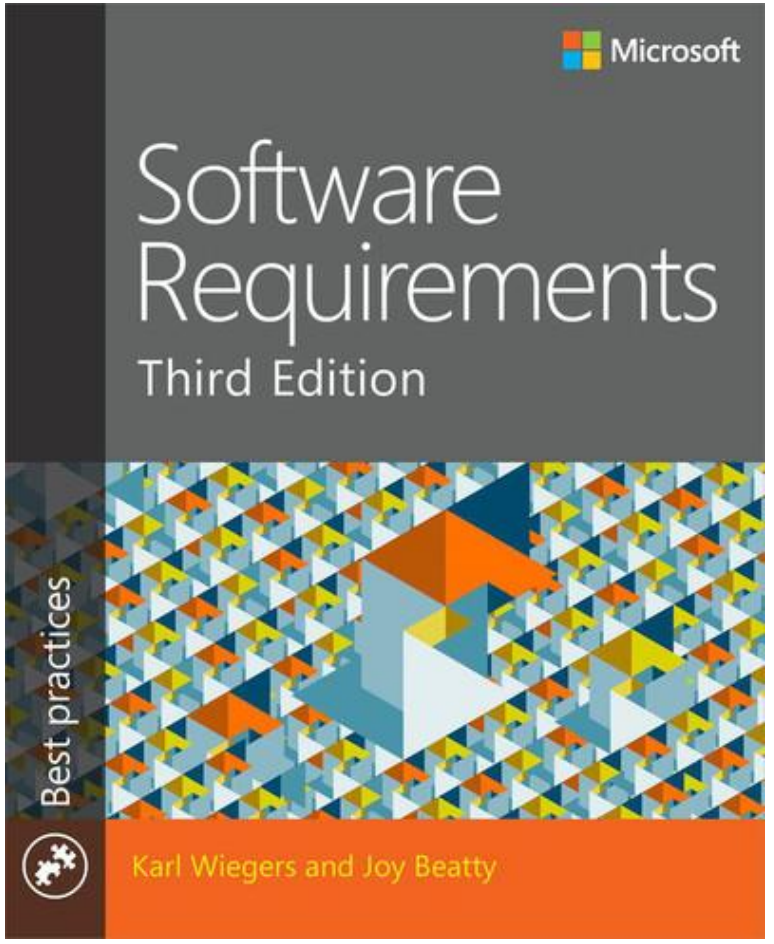
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