Requirements Engineering

Software Engineering Seminar

Author: Eng. Carlos Andrés Sierra, M.Sc.
cavirguezs@udistrital.edu.co

Full-time Adjunct Professor
Computer Engineering Program
School of Engineering
Universidad Distrital Francisco José de Caldas

2025-III

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Outline

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Outline

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Concepts Generation

- **Concepts generation** is the process of creating ideas for a system that meet the needs of its users.
- It involves brainstorming, research, and analysis to generate innovative ideas for a system.
- It is a creative process that encourages innovation and creativity in the design of a system.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Concepts Generation

- **Concepts generation** is the process of creating ideas for a system that meet the needs of its users.
- It involves brainstorming, research, and analysis to generate innovative ideas for a system.
- It is a creative process that encourages innovation and creativity in the design of a system.

Concepts Generation

- **Concepts generation** is the process of creating ideas for a system that meet the needs of its users.
- It involves brainstorming, research, and analysis to generate innovative ideas for a system.
- It is a creative process that encourages innovation and creativity in the design of a system.

Innovation and Creativity

- **Innovation** is the process of creating new ideas and solutions that improve the performance of a system.
- **Creativity** is the ability to generate original and innovative ideas that solve problems and meet the needs of users.
- They are important for ensuring that a system is robust, efficient, and effective.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Innovation and Creativity

- **Innovation** is the process of creating new ideas and solutions that improve the performance of a system.
- **Creativity** is the ability to generate original and innovative ideas that solve problems and meet the needs of users.
- They are important for ensuring that a system is robust, efficient, and effective.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Innovation and Creativity

- **Innovation** is the process of creating new ideas and solutions that improve the performance of a system.
- **Creativity** is the ability to generate original and innovative ideas that solve problems and meet the needs of users.
- They are important for ensuring that a system is robust, efficient, and effective.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Is this Innovation & Creativity?

A real videogames console revolution!

Concepts Selection

- **Concepts selection** is the process of evaluating and choosing the best ideas for a system.
- It involves analysis, comparison, and evaluation of concepts to determine which ones are the most feasible and effective.
- It is a critical process that ensures that the final design of a system meets the needs of its users.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Outline

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Stakeholders Vs. Shareholders

- **Stakeholders** are individuals or groups who have an interest in the success of a project.
- **Stakeholders** can be internal or external to a company. For example, customers, employees, suppliers, and regulators are external stakeholders.
- **Shareholders** are individuals or groups who have an ownership interest in a company.
- **Shareholders** are typically internal to a company. For example, investors, owners, and managers are considered shareholders.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Stakeholders Vs. Shareholders

- **Stakeholders** are individuals or groups who have an interest in the success of a project.
- **Stakeholders** can be internal or external to a company. For example, customers, employees, suppliers, and regulators are external stakeholders.
- **Shareholders** are individuals or groups who have an ownership interest in a company.
- **Shareholders** are typically internal to a company. For example, investors, owners, and managers are considered shareholders.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Requirements

- **Requirements** are statements that describe the features, functions, and constraints of a system.
- **Requirements** are used to communicate the needs of stakeholders to developers.
- **Requirements** are used to guide the design, development, and testing of a system.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Requirements

- **Requirements** are statements that describe the features, functions, and constraints of a system.
- **Requirements** are used to communicate the needs of stakeholders to developers.
- **Requirements** are used to guide the design, development, and testing of a system.

Requirements Types

- **Functional requirements** describe the functions and features of a system.
- **Non-functional requirements** describe the quality attributes of a system, such as performance, reliability, and usability.
- **Constraints** are the limitations or restrictions that a system must satisfy.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Requirements Types

- **Functional requirements** describe the functions and features of a system.
- **Non-functional requirements** describe the quality attributes of a system, such as performance, reliability, and usability.
- **Constraints** are the limitations or restrictions that a system must satisfy.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Requirements Types

- **Functional requirements** describe the functions and features of a system.
- **Non-functional requirements** describe the quality attributes of a system, such as performance, reliability, and usability.
- **Constraints** are the limitations or restrictions that a system must satisfy.

User Stories

- **User stories** are short, simple descriptions of a feature or function of a system.
- They are written from the perspective of the user and describe what the user wants to achieve.
- They are used to capture the requirements of a system in a simple and understandable way.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

User Story Format [Example]

User Story

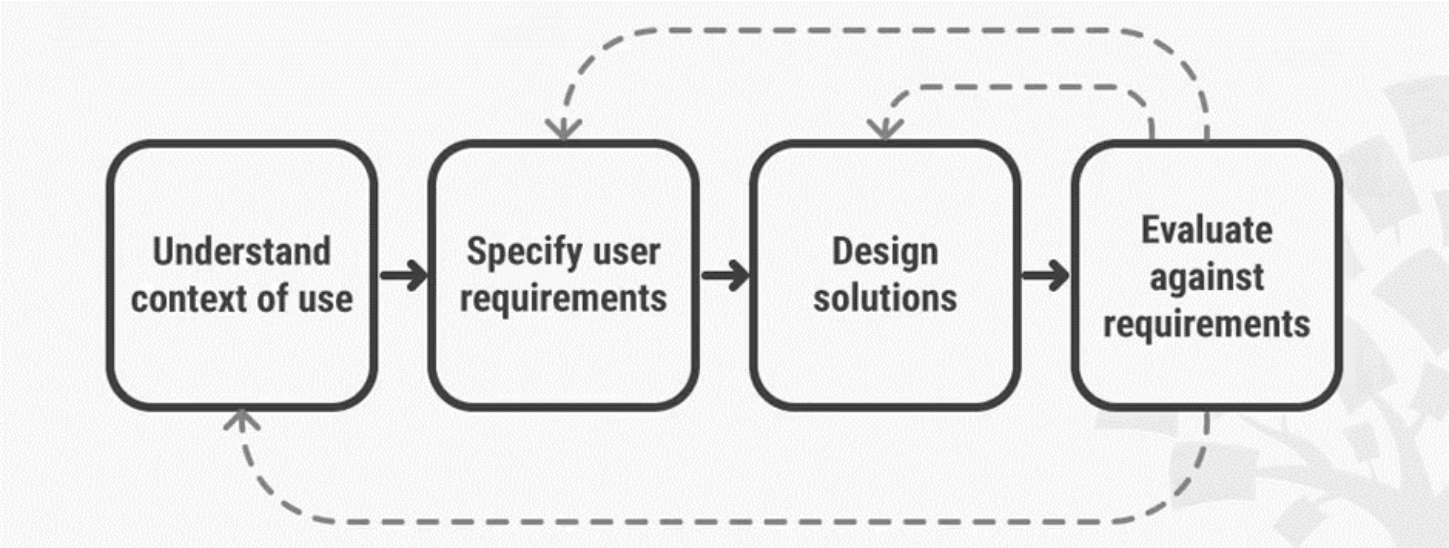
Title:	Priority:	Estimate:
User Story: As a [description of user], I want [functionality] so that [benefit].		
Acceptance Criteria: Given [how things begin] When [action taken] Then [outcome of taking action]		

ProductPlan

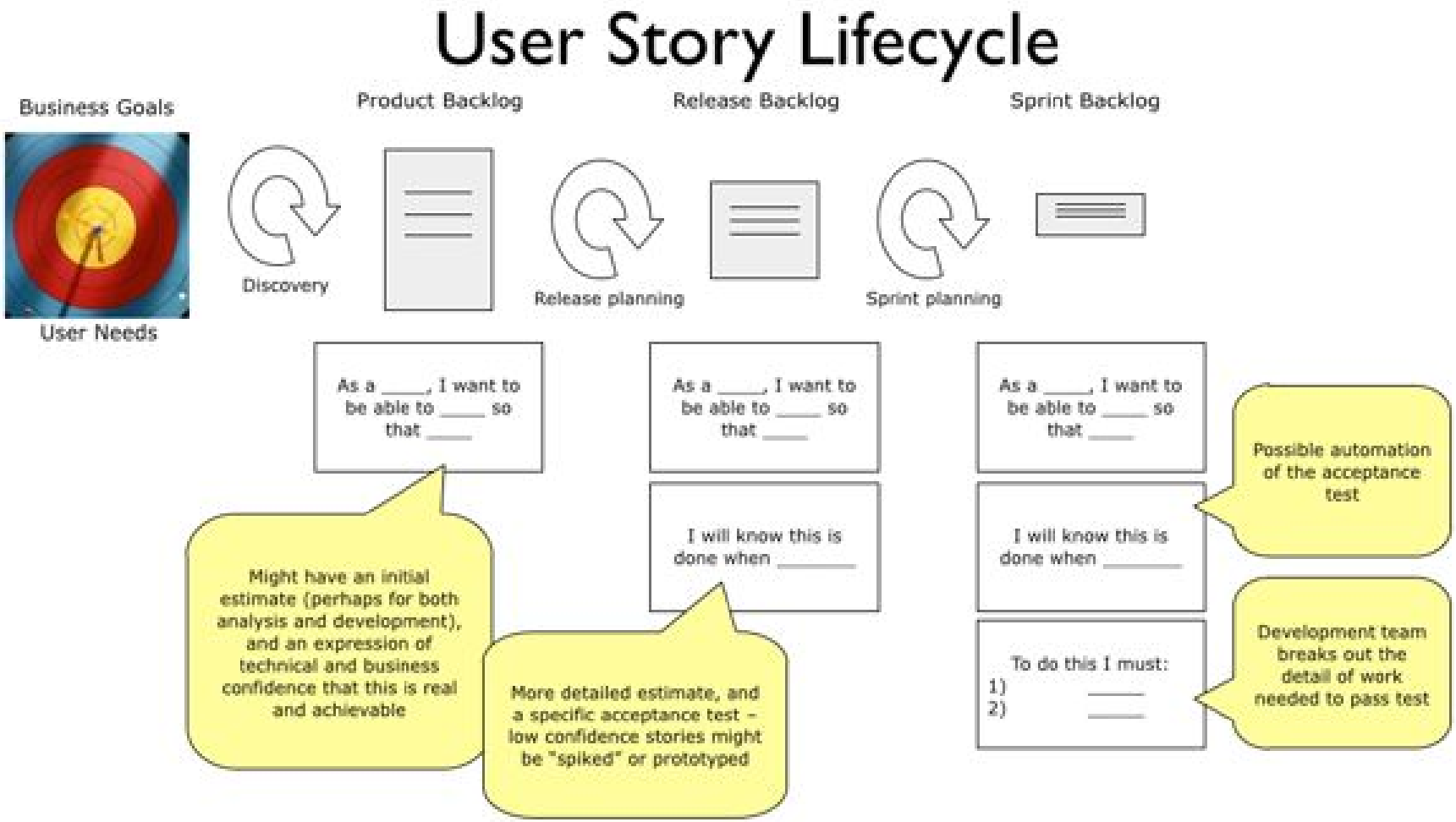
UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

User-Centered Design (UCD)

- **User-centered design** (UCD) is an iterative design process that focuses on understanding the needs, preferences, and behaviors of users.
- UCD is a collaborative process that involves users in the design and development of a system.
- UCD is used to create systems that are usable, efficient, and satisfying to users.



User Story Lifecycle



Outline

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

What is Requirements Engineering?

- **Requirements engineering** is the process of eliciting, analyzing, specifying, validating, and managing the requirements of a system.
- It is a critical activity in the systems development lifecycle that ensures that the system meets the needs of its users.
- It is a collaborative process that involves stakeholders from different backgrounds and perspectives.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

What is Requirements Engineering?

- **Requirements engineering** is the process of eliciting, analyzing, specifying, validating, and managing the requirements of a system.
- It is a critical activity in the systems development lifecycle that ensures that the system meets the needs of its users.
- It is a collaborative process that involves stakeholders from different backgrounds and perspectives.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Requirements Engineering Process

The **requirements engineering** process *consists* of the following activities:

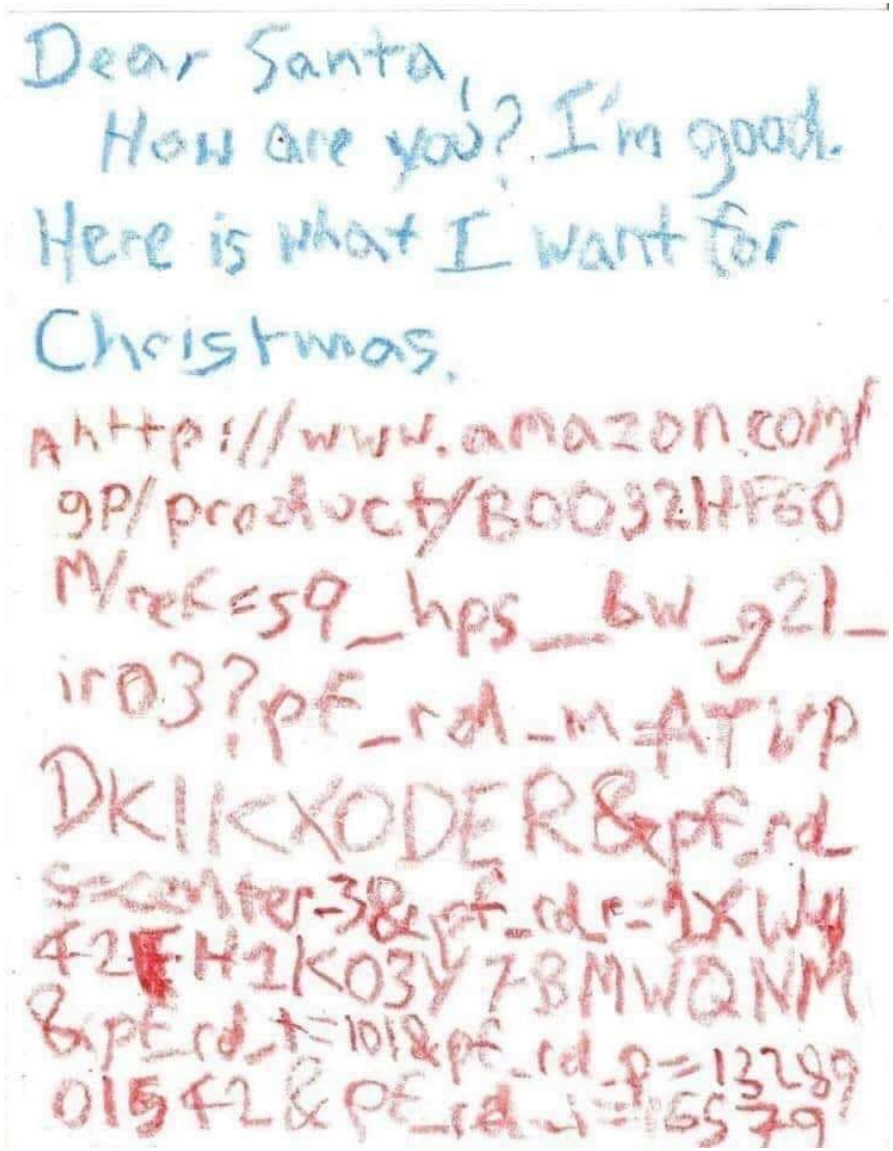
- Gathering requirements.
- Analyzing requirements.
- Validating requirements.
- Documenting requirements.
- Managing requirements.
- Verifying requirements.
- Communicating requirements.

Gathering Requirements

- **Gathering** requirements is the process of collecting and documenting the needs of stakeholders.
- It involves interviewing stakeholders, conducting surveys, and observing users to understand their requirements.
- It is essential to prioritize requirements based on stakeholder feedback and project goals.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Clients Are Not Always Right

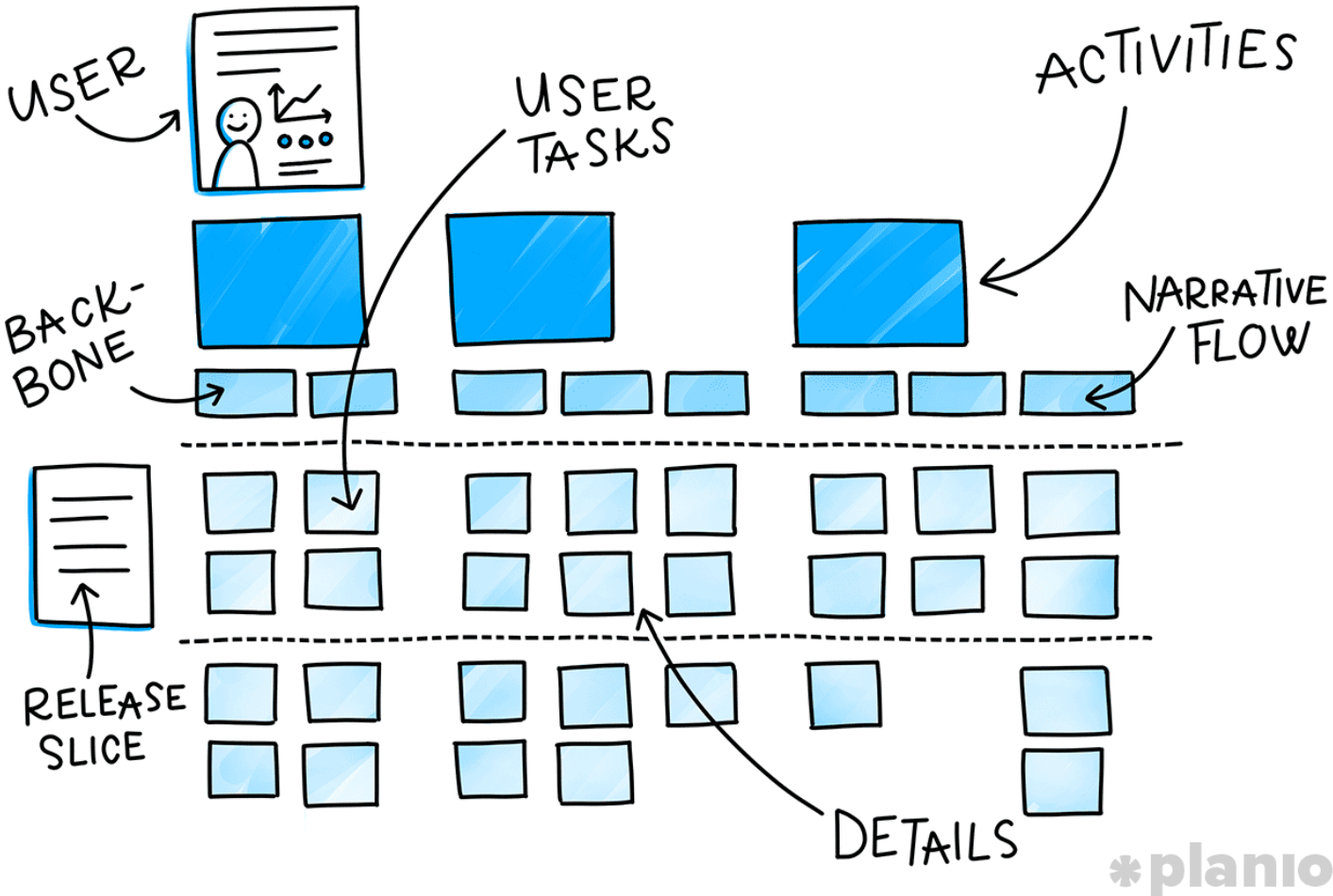


Analyzing Requirements

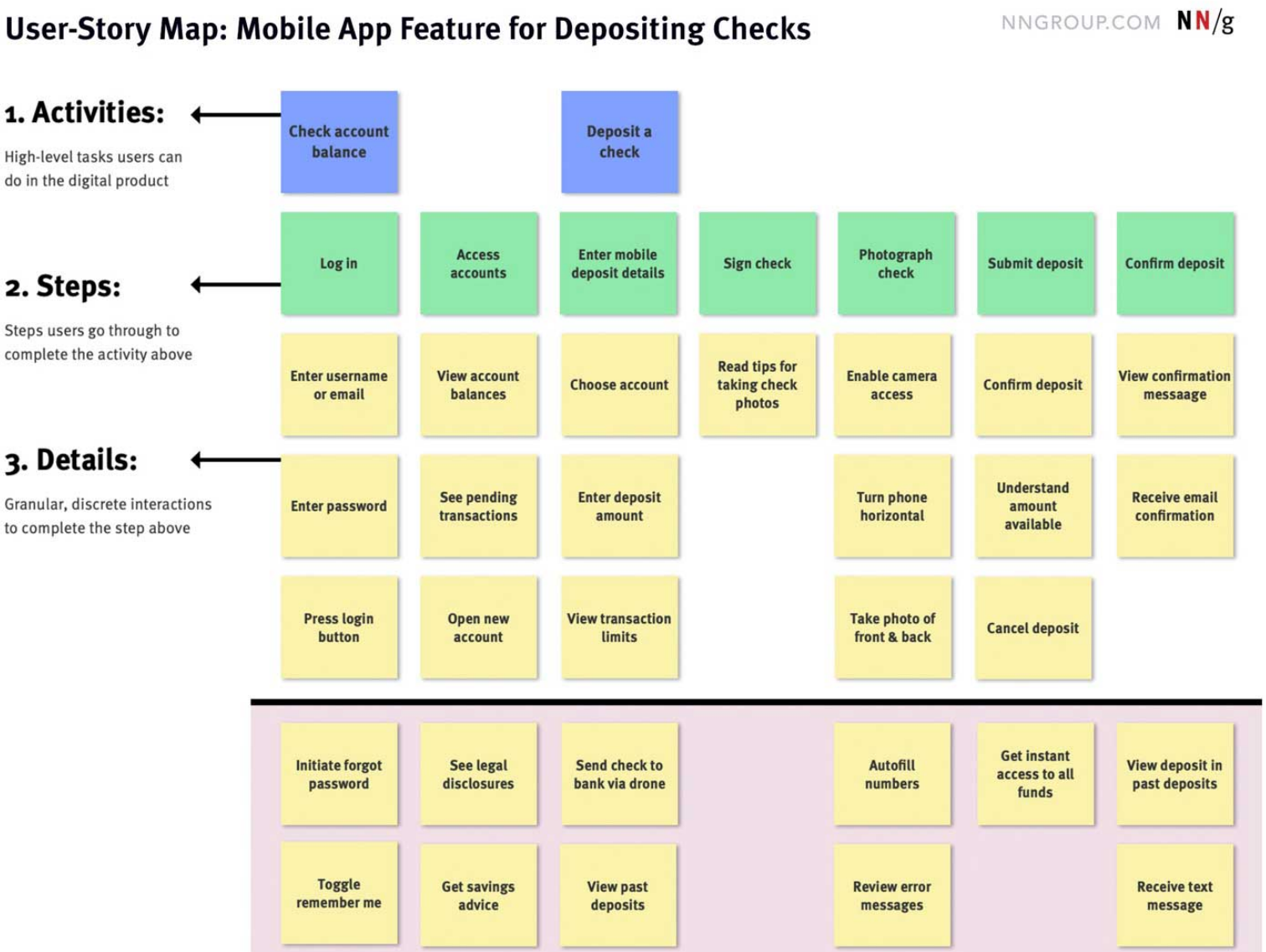
- **Analyzing** requirements is the process of examining and understanding the requirements of a system.
- It involves identifying dependencies, conflicts, and inconsistencies in the requirements.
- It is a critical activity that ensures that the requirements are complete, consistent, and correct.

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

User Story Mapping



USM: Study Case

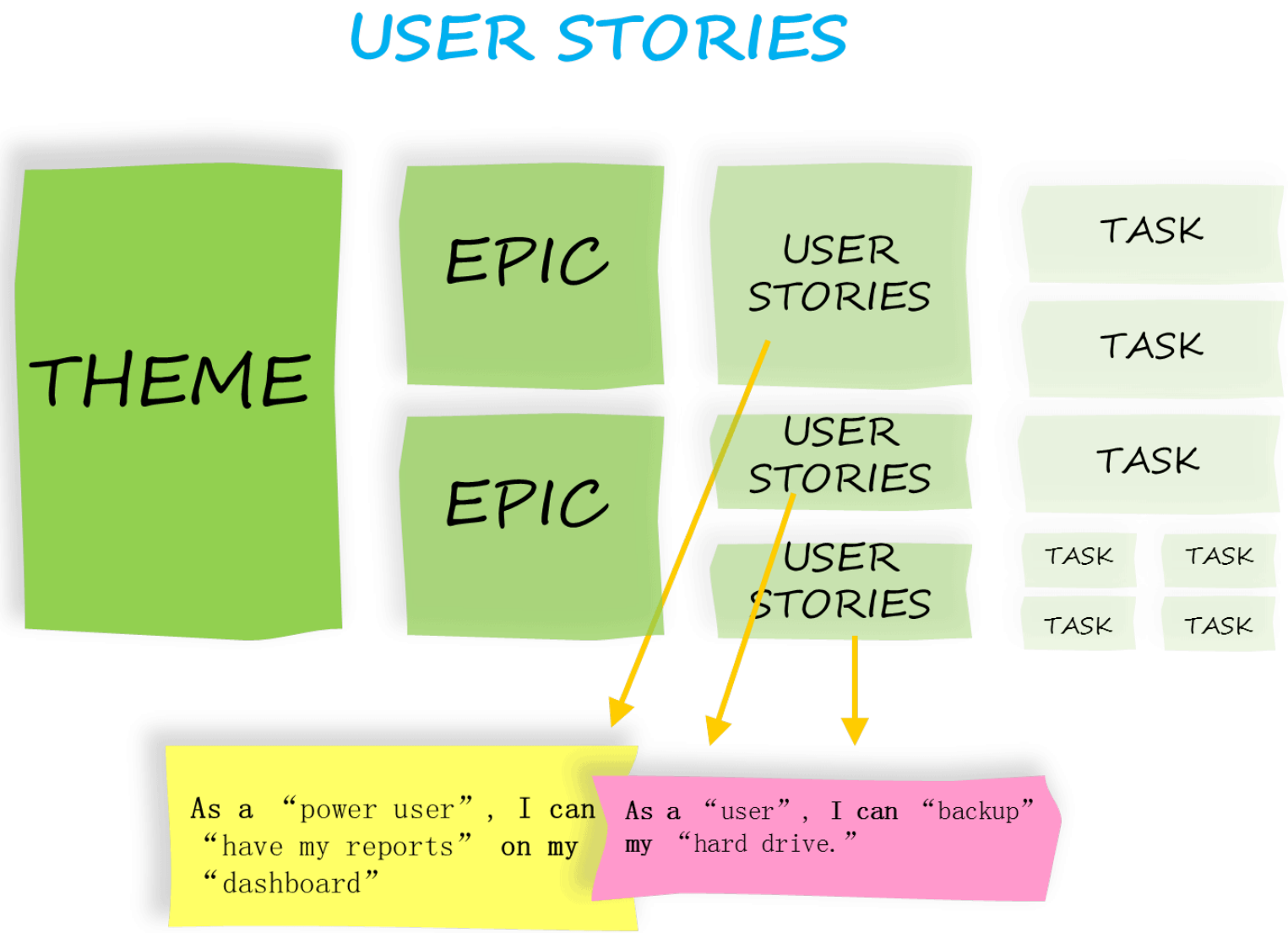


Documenting Requirements

- **Documenting** requirements is the process of writing and organizing the requirements of a system.
- It involves creating documents, diagrams, and models that describe the requirements in a clear and concise way.
- It is a collaborative process that involves stakeholders from different backgrounds and perspectives.

Everyone Hates Writing Documentation

User Stories Hierarchy



Validating Requirements

- **Validating** requirements is the process of ensuring that the requirements are correct and complete.
- It involves reviewing the requirements with stakeholders to verify that they meet their needs.
- It is important to document any changes made during the validation process.
- It is also crucial to review the validation results with stakeholders to ensure alignment with their expectations.

Clients Are Not Always Right

Dad Jokes
@Dadsaysjokes

My dad told me his password is: MickeyMinnieGoofyDonaldPlutoHueyLouieDeweyDublin.

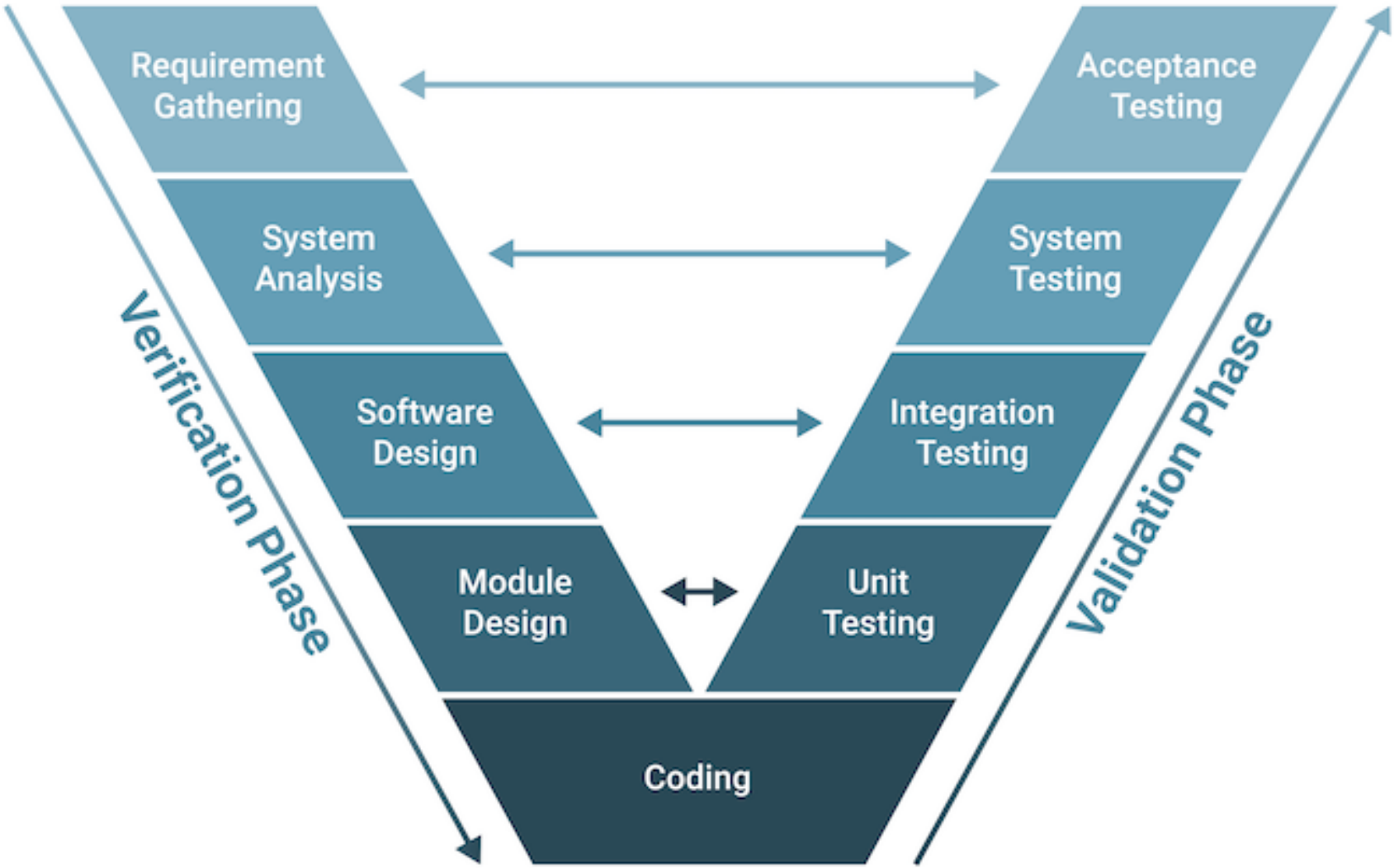
Because he was told his password had to contain 8 characters and at least one Capital.

Verifying Requirements

- **Verifying** requirements is the process of ensuring that the requirements are correctly implemented in the system.
- It involves testing the system to verify that it meets the requirements.
- It is a critical activity that ensures that the system is functional, reliable, and usable.

Typical Mistakes When Testing

V-Model in SDLC



Outline

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

Thanks!

Questions?

Repo: *www.github.com/EngAndres/ud-public/tree/main/courses/software_engineering_seminar*

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS