

REQUIREMENTS ENGINEERING

Software Engineering Seminar

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Outline

- 1 Concepts Generation & Selection
- 2 Basic Concepts
- 3 Requirements Engineering



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2 Basic Concepts

3 Requirements Engineering



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**.



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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**.



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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**.



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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.



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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**.



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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**.



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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.



User Story Format [Example]

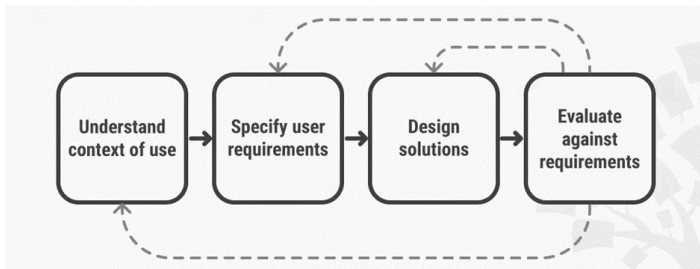
User Story

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]		

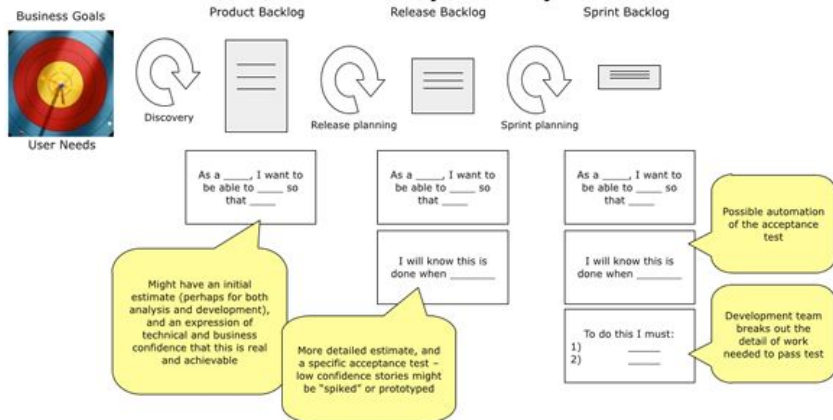
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User-Centered Design (UCD)

- **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



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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**.



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.



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.



Clients Are Not Always Right

Dear Santa,
 How are you? I'm good.
 Here is what I want for
 Christmas.

http://www.amazon.com/gp/product/B0032HFG0M/ref=ssq_hps_bw_g21-ir03?pf_rd_m=ATVPDKIKX0DER&pf_rd_s=center-3&pf_rd_e=gxwy42FH2K03Y7BMWQNM&pf_rd_t=101&pf_rd_p=1328901542&pf_rd_i=16579

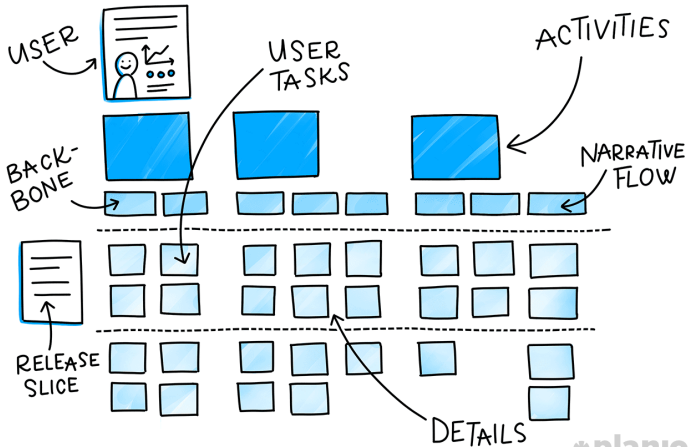


Analyzing Requirements

- **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**.



User Story Mapping



*planio



USM: Study Case

User-Story Map: Mobile App Feature for Depositing Checks

NNGROUP.COM NN/g

1. Activities:

High-level tasks users can do in the digital product

Check account balance

Deposit a check

2. Steps:

Steps users go through to complete the activity above

Log in

Access accounts

Enter mobile deposit details

Sign check

Photograph check

Submit deposit

Confirm deposit

Enter username or email

View account balances

Choose account

Read tips for taking check photos

Enable camera access

Confirm deposit

View confirmation message

3. Details:

Granular, discrete interactions to complete the step above

Enter password

See pending transactions

Enter deposit amount

Turn phone horizontal

Understand amount available

Receive email confirmation

Press login button

Open new account

View transaction limits

Take photo of front & back

Cancel deposit

Initiate forgot password

See legal disclosures

Send check to bank via drone

Autofill numbers

Get instant access to all funds

View deposit in past deposits

Toggle remember me

Get savings advice

View past deposits

Review error messages

Receive text message



Documenting Requirements

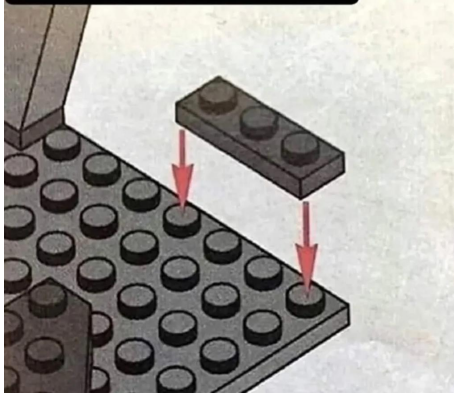
- **Documenting** requirements is the **process** of **writing** and **organizing** the **requirements** of a **system**.
- It involves **creating documents**, **diagrams**, and **models** that **describe** the **requirements** in a **clear** and **concise** way.
- It is a **collaborative process** that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



Everyone Hates Writing Documentation

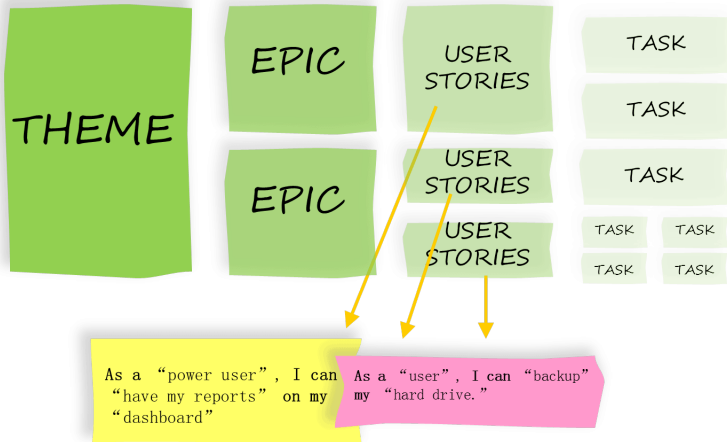
**En la documentación
está todo bien explicado**

La documentación:



User Stories Hierarchy

USER STORIES



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:
MickeyMinnieGoofyDonaldPlutoHuey
LouieDeweyDublin.

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

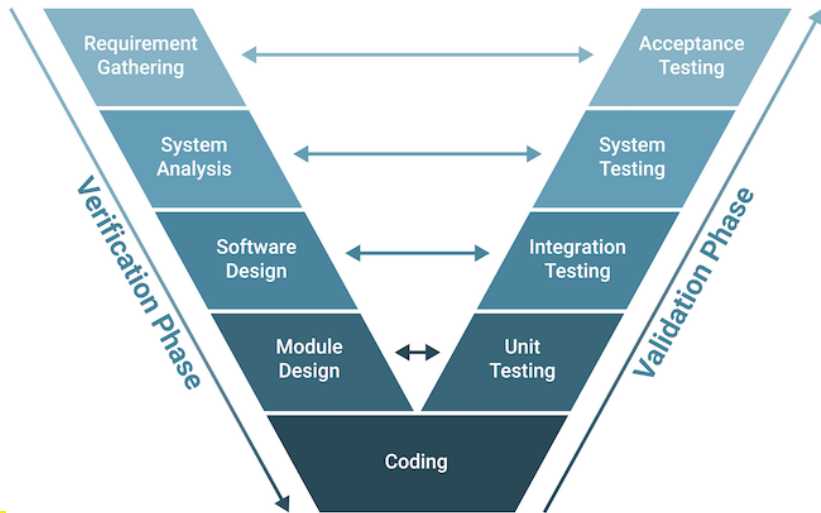
Disturbing Chinese calorie app...



	カシューナッツ (cashew)	1粒	9 kcal
	ジャムパン (Pomeranian)	1個	327 kcal



V-Model in SDLC



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Thanks!

Questions?



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

