

REQUIREMENTS ENGINEERING

Software Engineering Seminar

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Outline

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



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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?



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**.
- **Shareholders** are **individuals** or **groups** who have an **ownership** **interest** in a **company**.
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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**.
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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.



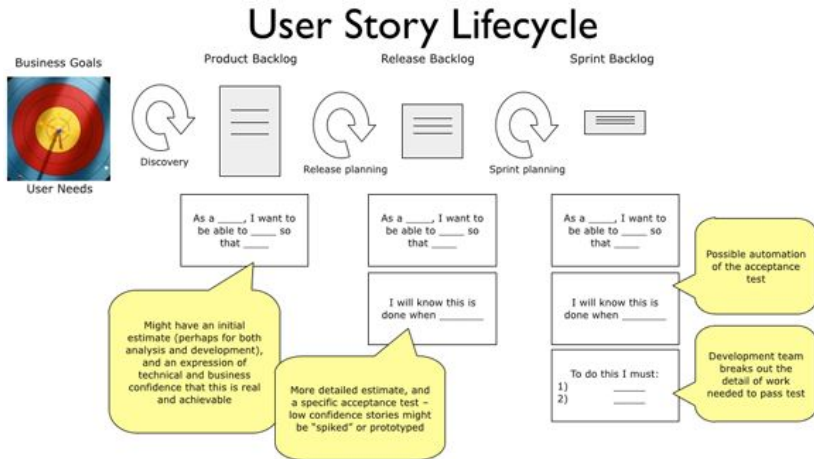
User Story Format [Example]

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]		

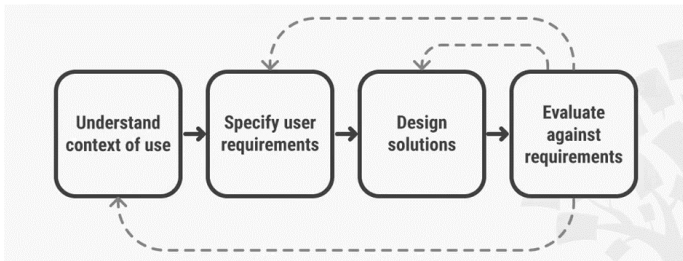
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User Story lifecycle



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.



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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**.



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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.

A http://www.amazon.com/gp/product/B0032HFG0M/ref=ssq_hps_bw_g21-ir03?pf_rd_m=ATVPDKIKXODER&pf_rd_s=center-3&pf_rd_e=gxwy42FH2K03Y7BMWQNM&pf_rd_t=101&pf_rd_p=1328901542&pf_rd_i=165379

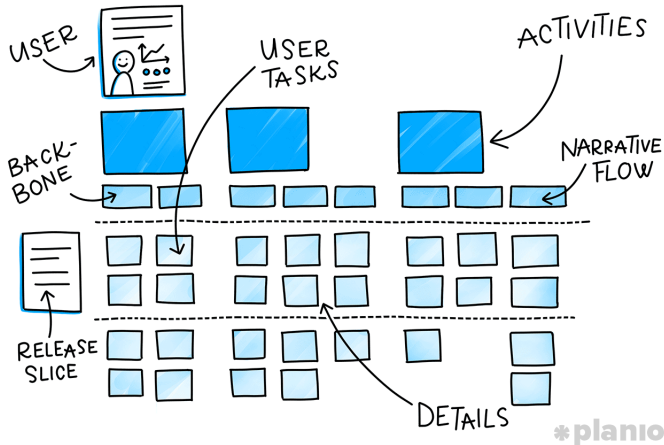


Analyzing Requirements

- **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



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**.
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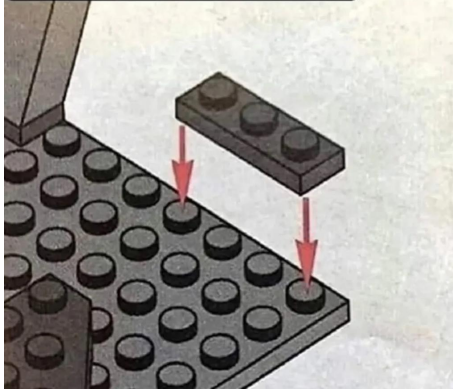
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Everyone hates to write Documentation

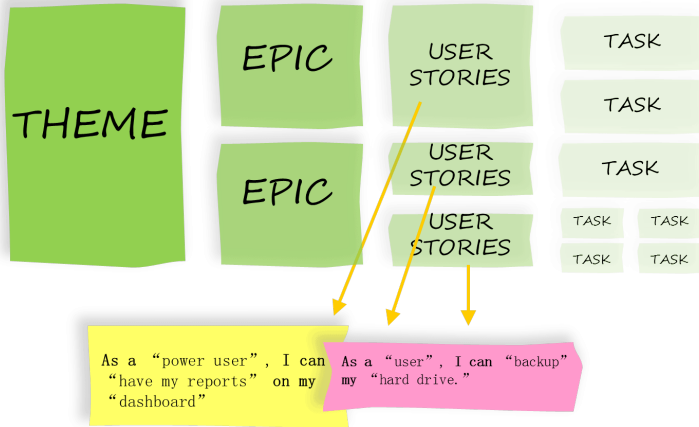
**En la documentación
está todo bien explicado**

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**.



NOT Clear Understanding of Requirements



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

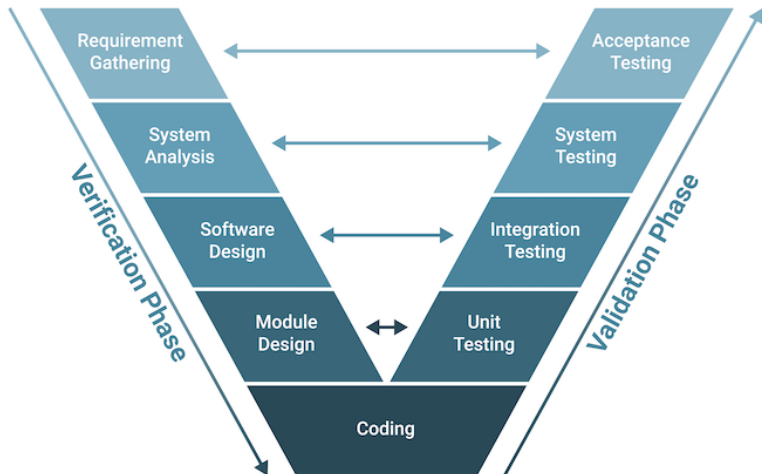
Disturbing Chinese calorie app...



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



V-Model inn SDLC



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Thanks!

Questions?



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