SE202
Introduction to Software Engineering

Lecture 4-1
Requirement Engineering

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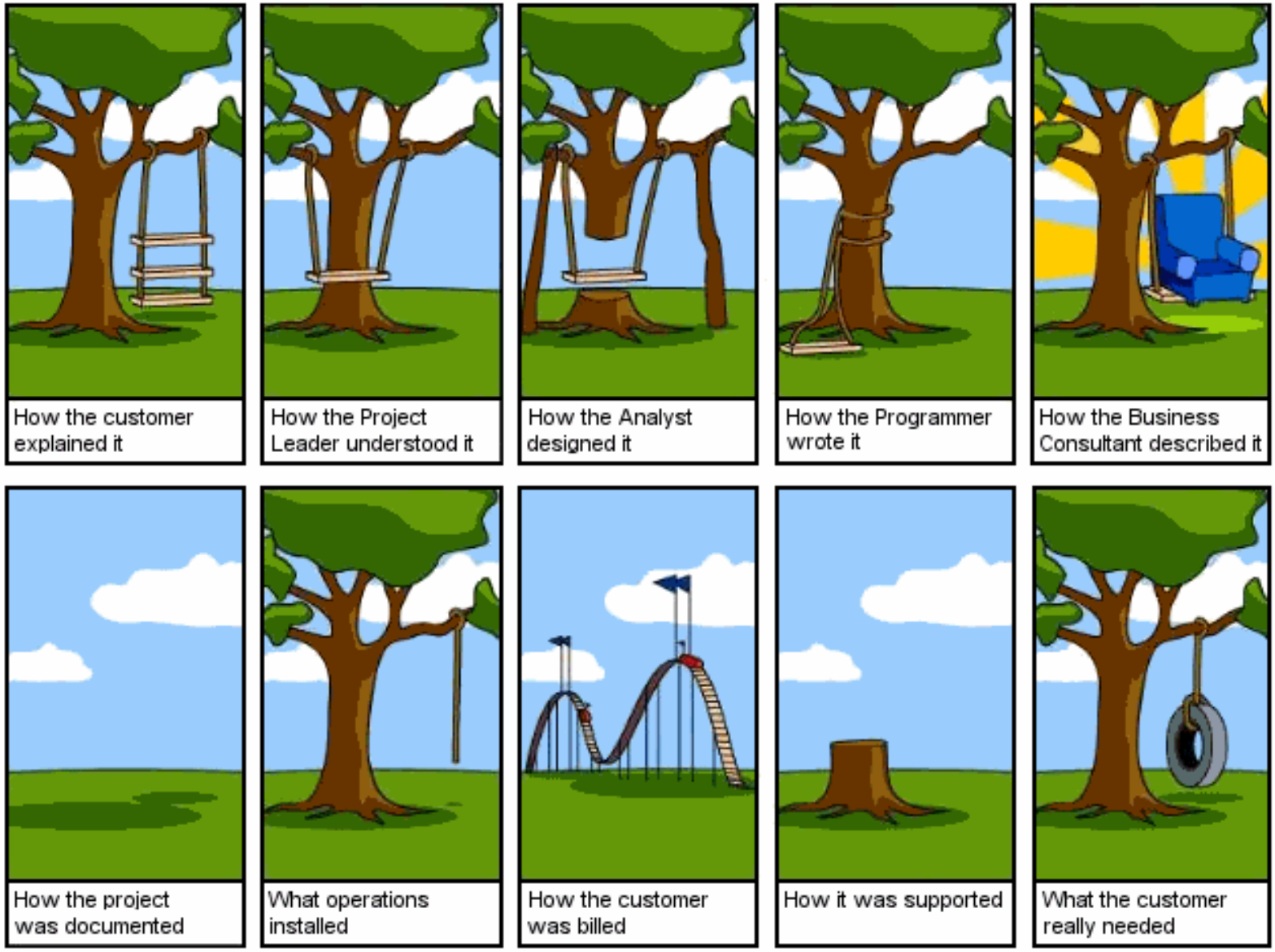
Last Lecture

- Project Management

Today’s topics

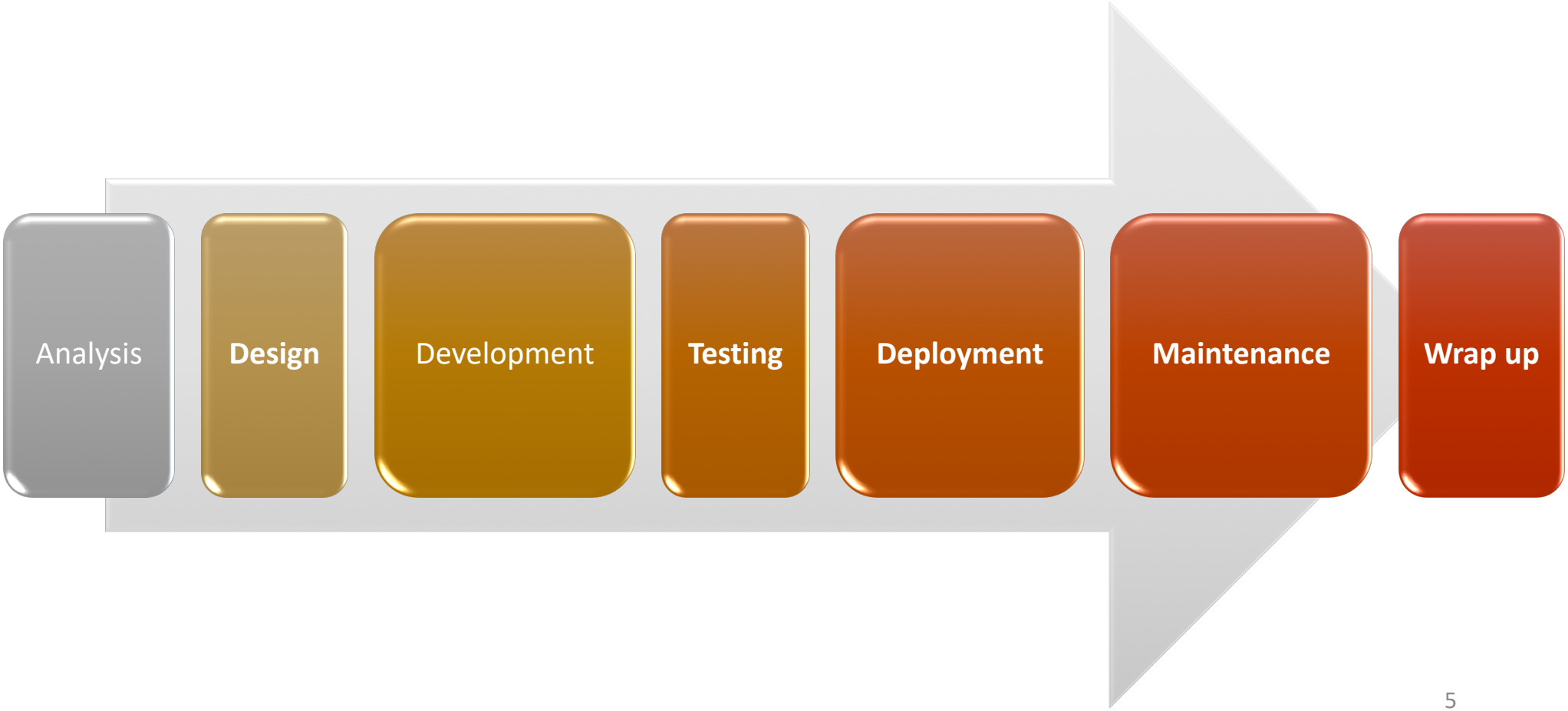
- Requirement Engineering Process
- Requirement elicitation



Software requirements - Description of features and functionalities of the target system.

Many projects are delayed (or fail completely) because development begins before anyone on the project team really understands how the software should behave.

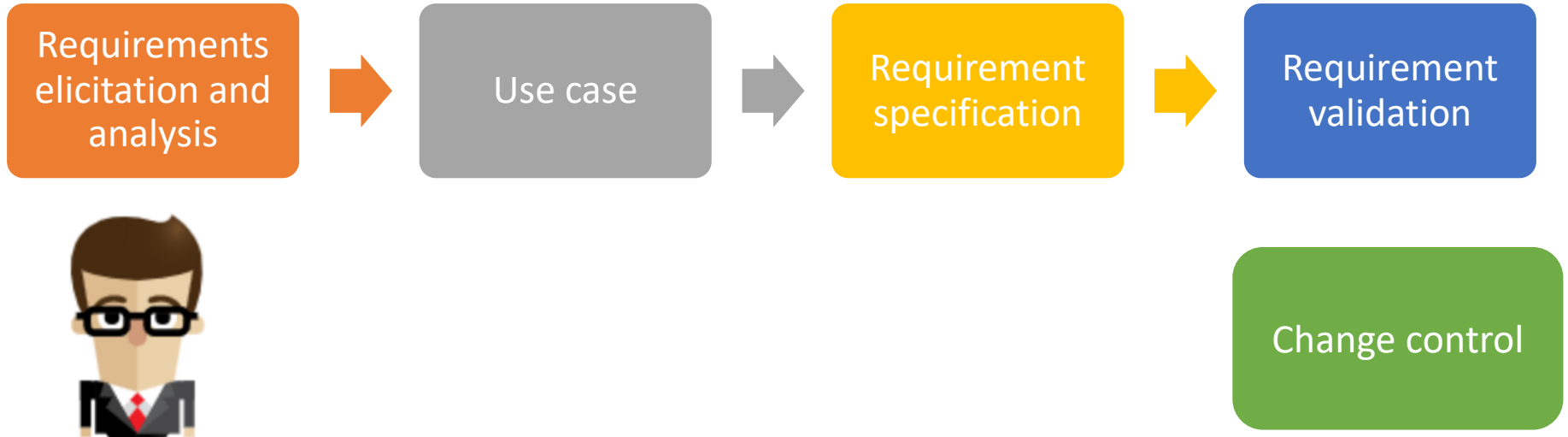
*S*oftware *D*evelopment *L*ife *C*ycle (SDLC)



Softwre Requirements Engineering

Software requirements engineering

- The art and science of developing an accurate and complete definition of the behavior of software that can serve as the basis for software development.



Requirements analyst or business systems analyst

Sub-Processes of RE

- **Elicitation and analysis**: discovering requirements to define problems and scope
- **Specification**: converting the requirements into standard form
- **Validation**: checking if the requirements actually define the system that is needed
- **Change control**: handling changes that happen all over the project

Requirements elicitation and analysis

- The process of gathering, understanding, analyzing, reviewing, and articulating the needs of the software project's stakeholders and users.
- Elicitation involves fact-finding, validating one's understanding of the information gathered, and communicating open issues for resolution.
- Goal
  - To create a complete list of what the users believe are important requirements.

Requirement Gathering Techniques

- Interviews
- Focus group
- Document analysis
- Observation
- Prototyping
- Workshops
- Surveys

The requirements analyst must figure out how to get that information out of each user, stakeholder, expert, and anyone else who has information that may impact the project.

Interviews

- Formal or informal
- Individual or group
- Face-to-face or phone
- Open ended questions to find information and gaps
  - What does the current system look like?
  - What are the challenges?
  - How do you see the solution?
- Closed ended questions to confirm and validate
  - Are you satisfied with this product? → *Yes/No/Mostly/Not quite*

Note: Interviews are not a good way to reach consensus.

Focus group

- Elicit information from a select group via facilitator
- Very formal process
- Usually has 6-12 attendees
- Engage all members
- Remain neutral
- Promote discussion

Note: Focus groups save time and cost by not having to conduct many individual interviews.

Documents analysis

- Existing documentation
- Stakeholders and experts are not available
- Examples
  - Business plan
  - Project charter (project definition)
  - Contracts
  - Statement of work
  - Memos
  - Email
  - Etc

Observation

- Study a stakeholder's work environment
- Explore a user's workflow and problems that the user encounters with the current system
- Identify ways to enhance and streamline the behavior of the software
- Maybe time consuming
- Passive
  - Do not ask questions and take notes
- Active
  - Dialog with the users while performing their work

Prototype

- Prototype is an early sample, model, or release of a product built to test a concept or process.
- Valuable for stakeholders with no technical background
- Visually represents UI
- Tools: paper, board, gomockingbird.com
- Stakeholders often find prototyping to be a concreate mean of identifying, describing and validating their interface needs.

Aims to obtain early feedback of stakeholders' ideas

Survey/Questionnaire

- Quickly gathering data from a large group of participate
- Create a set of questions and send them to the appropriate stakeholders
- Use tools (e.g. google form)
- ++ Very useful for quickly gathering data from a large group of participants
- ++ Inexpensive way to gather input from customers or potential end users
- -- they preclude the opportunity for in-person and hoc conversation
- -- Sometimes you won’t get many responses

Use a Discussion Summary

- Discussion summary is a single document that summarize the requirement analyst’s notes.
- Use discussion summary template (next slide)
- Review the discussion summary document by the lead users and stakeholders

Discussion summary template

A guide for a novice requirements analyst in leading interviews and meetings.

1. Project background
   a. Purpose of project
   b. Scope of project
   c. Other background information
2. Perspectives
   a. Who will use the system?
   b. Who can provide input about the system?
3. Project objectives
   a. Known business rules
   b. System information and/or diagrams
   c. Assumptions and dependencies
   d. Design and implementation constraints
4. Risks
5. Known future enhancements
6. References
7. Open, unresolved, or TBD issues

In class assignment

- Form your team of 4 people
- Learn Interview - Gather Requirements from the following clip
  - https://www.youtube.com/watch?v=I1RIhmf0IlI&t=2s
  - The clip covers
    - a case study
    - 3 phases of interview process
    - Example of Interview session (at 10:06)
    - Requirement gathering interview cheat sheet
- Complete a discussion summary of the interview session on a given template
  - P.s You may skip some topics on the template.