FILKOM

Requirement Engineering

Dasar Pengembangan Sistem Informasi

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Learning Outcomes

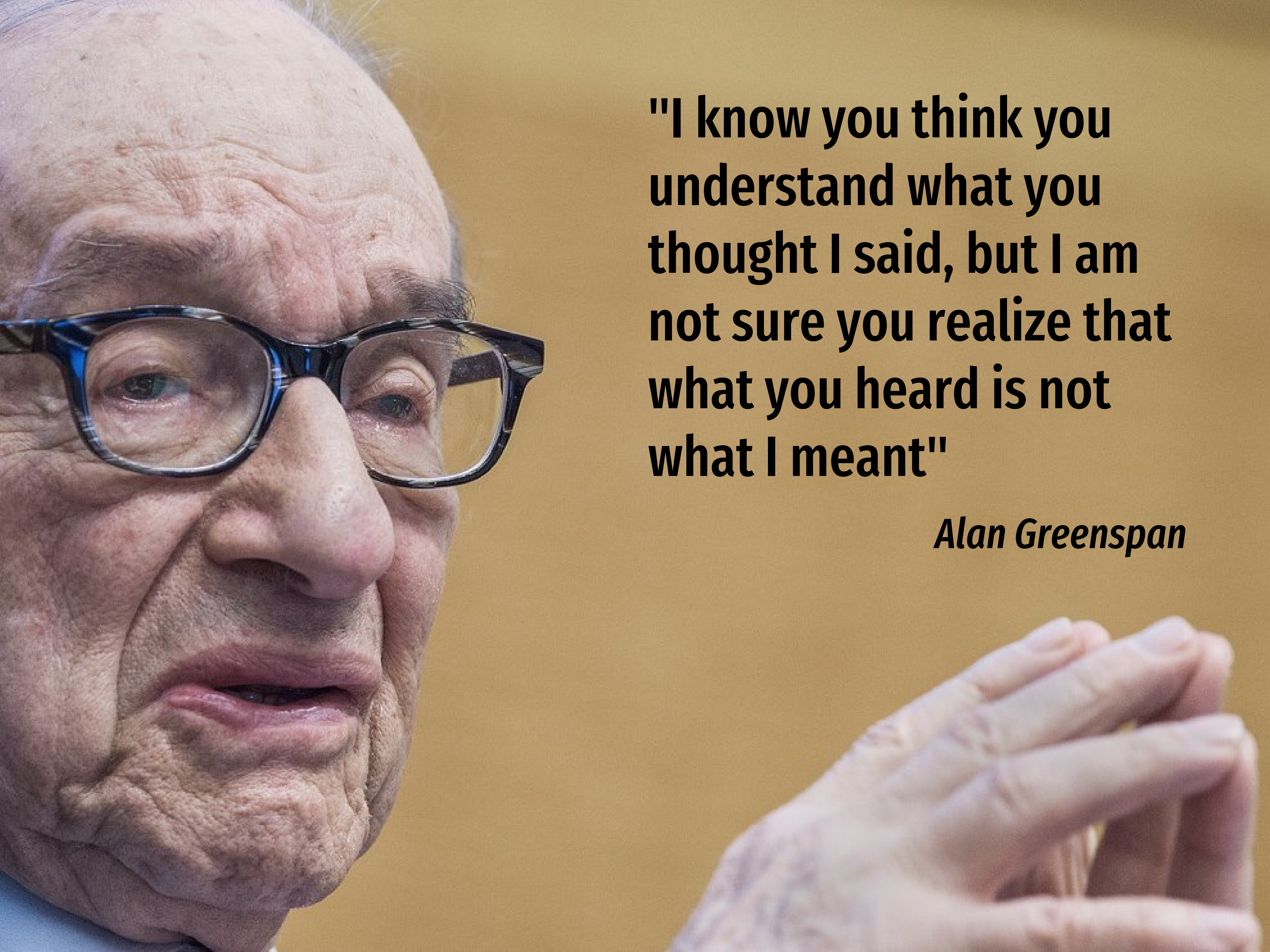
- Understand the definition and urgency of requirement engineering
- Understand the process of requirement engineering
- Understand problems related to requirement engineering

Contents

- Concept of Requirement Engineering
- Process of Requirement Engineering

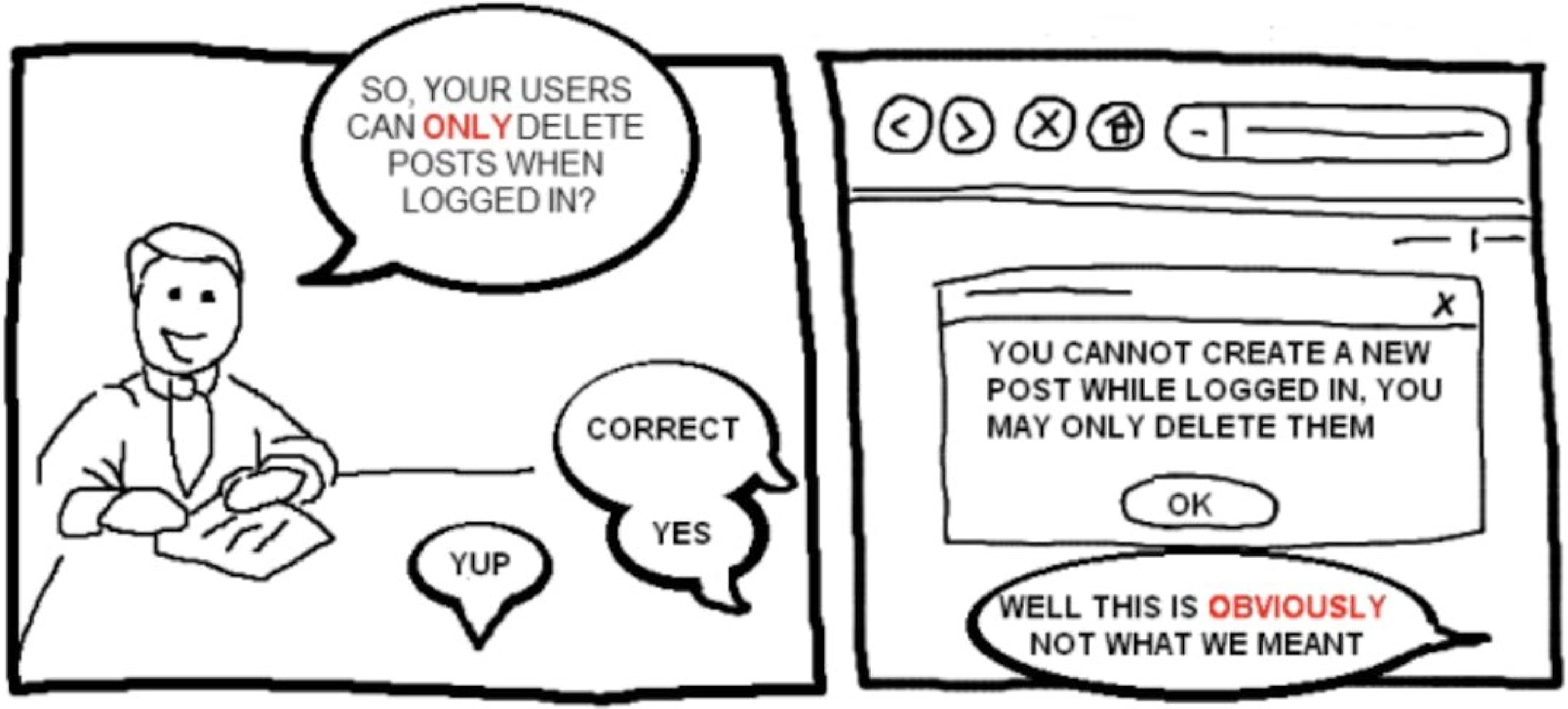
Background

- Software no longer relevant to customer needs
- By requirement analysis, software could adapt to what customers' actual needs.



"I know you think you understand what you thought I said, but I am not sure you realize that what you heard is not what I meant"

Alan Greenspan


SO, YOUR USERS CAN ONLY DELETE POSTS WHEN LOGGED IN?
CORRECT
YES
YUP
X
YOU CANNOT CREATE A NEW POST WHILE LOGGED IN, YOU MAY ONLY DELETE THEM
OK
WELL THIS IS OBVIOUSLY NOT WHAT WE MEANT

Requirement Engineering

- The process of establishing the services that the customer requires from a system and the constraints under which it operates and is developed

Ian Sommerville

- The broad spectrum of tasks and techniques that lead to an understanding of requirements

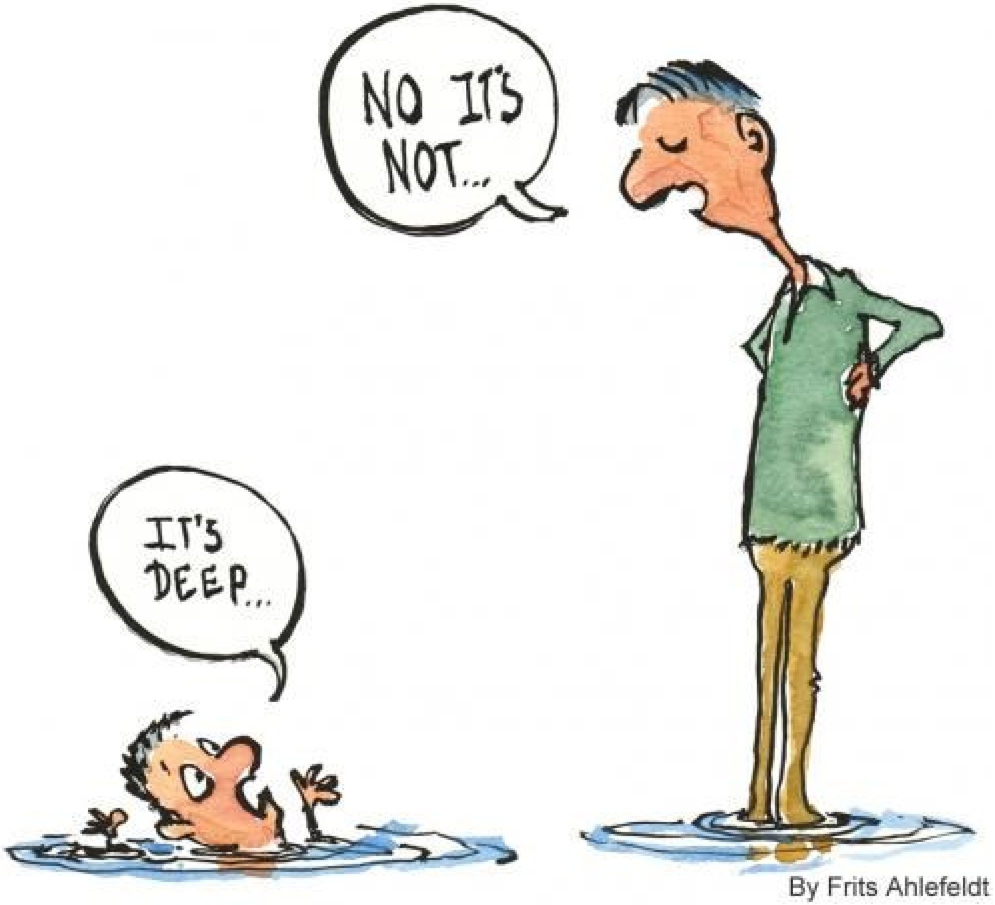
Roger S. Pressman

Requirements Engineering

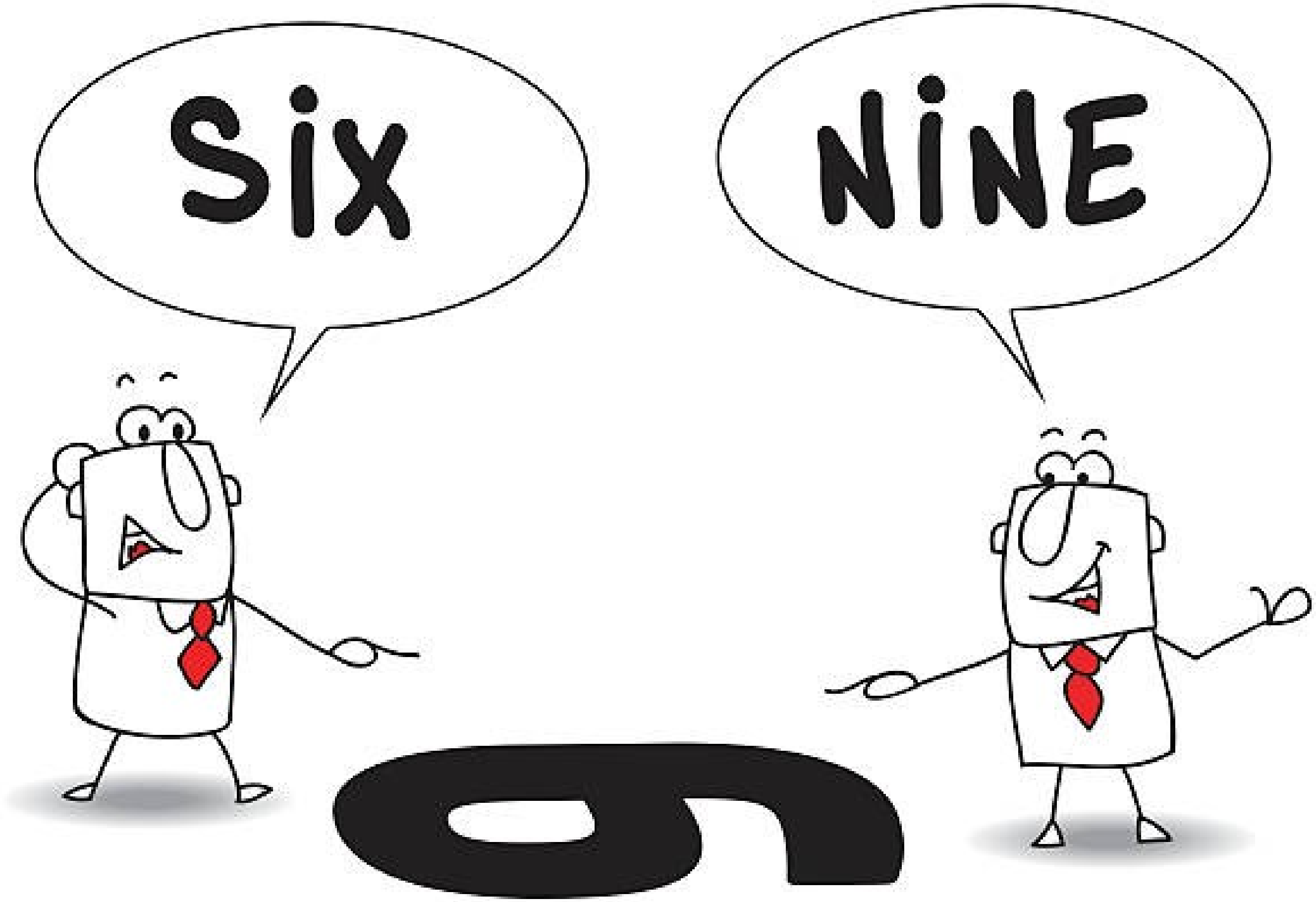
- Requirements engineering provides the appropriate mechanism for understanding what the customer wants, analyzing need, assessing feasibility, negotiating a reasonable solution, specifying the solution unambiguously, validating the specification, and managing the requirements as they are transformed into an operational system.

Thayer, R.H. and M. Dorfman

Different Perspective



Different Perspective



Requirement Engineering Categories

- Functional
  - What a system does
  - Process description, input, output
- Non-functional
  - Constraint or quality of a system
  - Performance, availability, security, reliability, implementation, design constraints, storage size
- Usability
  - Constraint to use
  - Acceptance criteria, end-user characteristics, system environments

Levels of Requirements

Normal requirement

- The objectives and goals that are stated for a product or system during meetings with the customer
- e.g., requested types of graphical displays, specific system functions, and defined levels of performance

Levels of Requirements

Expected requirement

- These requirements are implicit to the product or system and may be so fundamental that the customer does not explicitly state them.
- Their absence will be a cause for significant dissatisfaction.
- e.g., ease of human/machine interaction, overall operational correctness and reliability, and ease of software installation

Levels of Requirements

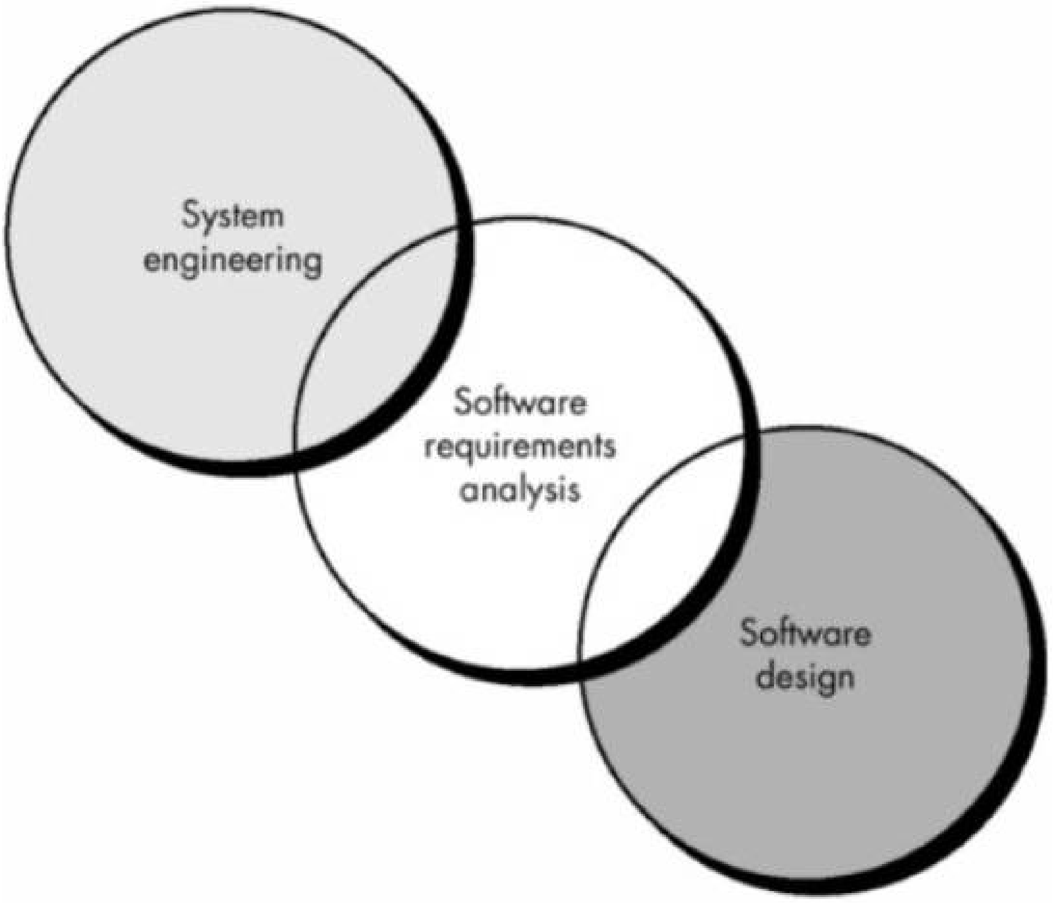
Exciting requirement

- These features go beyond the customer’s expectations and prove to be very satisfying when present
- e.g., smart or intelligent features that promote ease of use and productivity

Requirements Engineering

- RE is a software engineering task that bridges the gap between system level requirements engineering and software design
- Requirements analysis provides the software designer with a representation of information, function, and behavior that can be translated to data, architectural, interface, and component-level designs
- The requirements specification provides the developer and the customer with the means to assess quality once software is built.

Requirements Engineering



Process

- Requirement elicitation and analysis
- Requirement specification
- Requirement validation and verification
- Requirement management

Elicitation and Analysis

- Ask the customer, the users, and others
  - what the objectives for the system or product are,
  - what is to be accomplished,
  - how the system or product fits into the needs of the business, and finally,
  - how the system or product is to be used on a day-to-day basis.

Elicitation and Analysis

Problems that help us understand why requirements elicitation is difficult:

- Problem of scope
- Problem of understanding
- Problems of volatility

Christel and Kang

Requirement Elicitation Guidelines

- Assess the business and technical feasibility for the proposed system.
- Identify the people who will help specify requirements and understand theirorganizational bias.
- Define the technical environment placed.
- Identify “domain constraints”

Sommerville and Sawyer, 1997

Requirement Elicitation Guidelines

- Define one or more requirements elicitation methods (e.g., interviews, focus groups, team meetings).
- Solicit participation from many people so that requirements are defined from different points of view; be sure to identify the rationale for each requirement that is recorded.
- Identify ambiguous requirements as candidates for prototyping.

Sommerville and Sawyer, 1997

Work Products

- A statement of need and feasibility.
- A bounded statement of scope for the system or product.
- A list of customers, users, and other stakeholders who participated in the requirements elicitation activity.
- A description of the system’s technical environment.
- A list of requirements (preferably organized by function) and the domain constraints that apply to each.
- A set of usage scenarios that provide insight into the use of the system or product under different operating conditions.
- Any prototypes developed to better define requirements.

Example of Question

The first set of context-free questions focuses on the customer, the overall goals, and the benefits:

- Who is behind the request for this work?
- Who will use the solution?
- What will be the economic benefit of a successful solution?
- Is there another source for the solution that you need, overall goals, and the benefits

Example of Questions (2)

The next set of questions gain a better understanding of the problem and elicits customer' voice his or her perceptions:

- How would you characterize "good" output that would be generated by a successful solution?
- What problem(s) will this solution address?
- Can you show me (or describe) the environment in which the solution will be used?
- Will special performance issues or constraints affect the way the solution is approached?

Example of Questions (3)

The final set of questions focuses on the effectiveness of the meeting (meta-questions):

- Are you the right person to answer these questions? Are your answers "official"?
- Are my questions relevant to the problem that you have?
- Am I asking too many questions?
- Can anyone else provide additional information?
- Should I be asking you anything else?

Requirement Specification

- The final work product produced by the system and requirements engineer.
- It serves as the foundation for hardware engineering, software engineering, database engineering, and human engineering.
- It describes the function and performance of a computer-based system and the constraints that will govern its development

Requirement Specification (2)

- Requirement Definition
  - 1. Software should be able to provide ways to show and access files made by other tools. (SRS_PRJ_100)
- Requirement Specification
  - 1.1 Users should be provided means to define file type. (SRS_PRJ_101)
  - 1.2 Every file type is represented by a specific icon on user's screen. (SRS_PRJ_102)

Validation and Verification

- Examines the specification to ensure that all system requirements have been stated unambiguously;
- That inconsistencies, omissions, and errors have been detected and corrected
- The review team includes system engineers, customers, users, and other stakeholders

Validation and Verification (2)

- Validation:
  - Do we make the right product?
- Verification:
  - Do we make the product right?

- Methods:
  - Review: Software Specification Review (SSR)
  - Prototyping: Executable model of the system/software

Validation Parameter

Validation

- Validity: Does the system provide the functions which best support the customer’s needs?
- Consistency: Are there any requirements conflicts?
- Comprehensibility: Are all functions required by the customer included ?

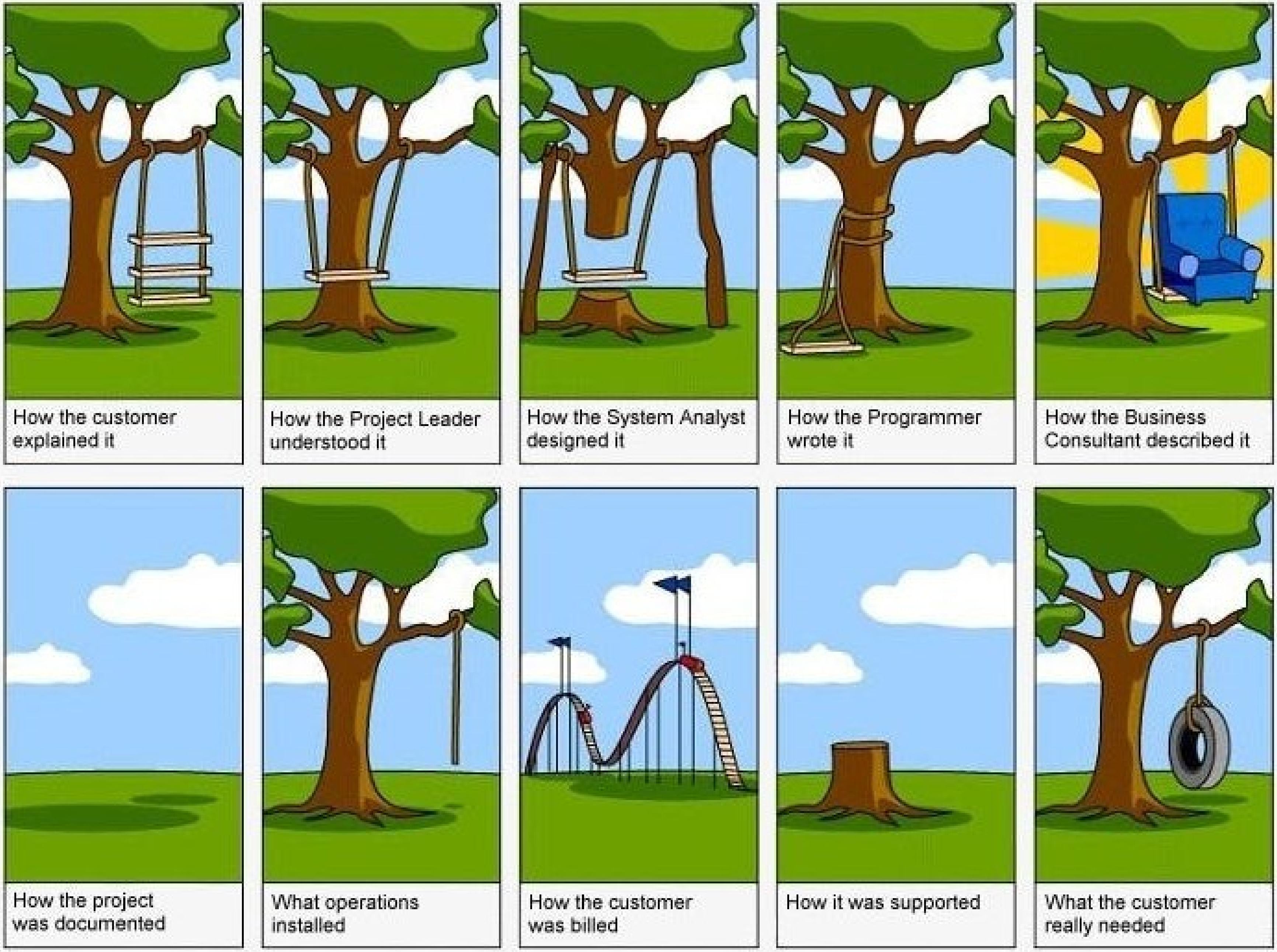
Verification Parameter

- Readability
- Testability
- Completeness
- Identifiability
- Ambiguity

Requirement Management

- Identification
- Change Management
- Documentation
- Tracking and Traceability

Challenges in Requirement Engineering


How the customer explained it
How the Project Leader understood it
How the System Analyst designed it
How the Programmer wrote it
How the Business Consultant described it
How the project was documented
What operations installed
How the customer was billed
How it was supported
What the customer really needed

Kit-Building Activity

mgm.ub.ac.id/index.php/kb

Username Format: NIM-Kelas

Contoh: 23241234567890-D

Kit ID: `kitre`

Questions?