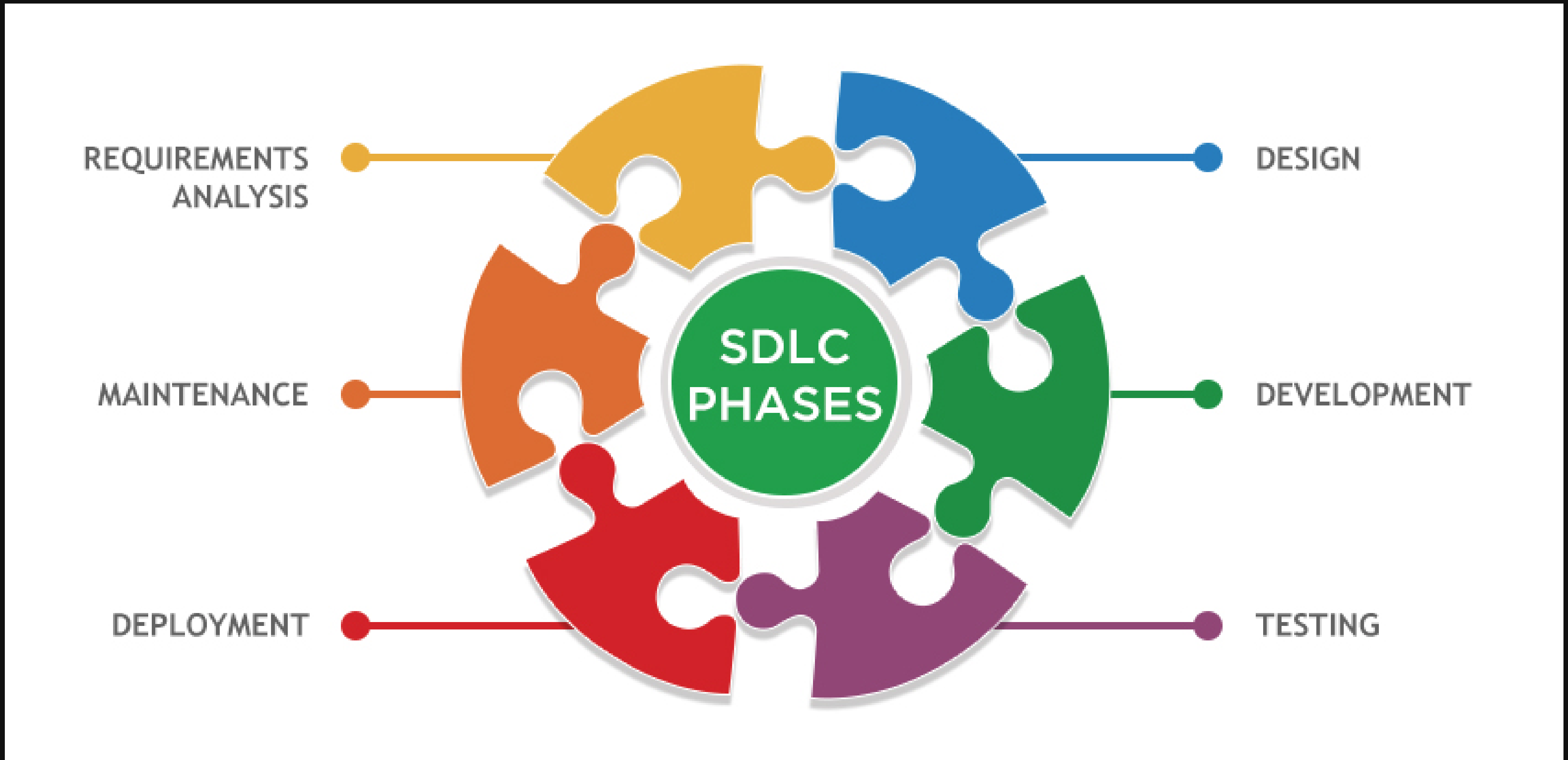
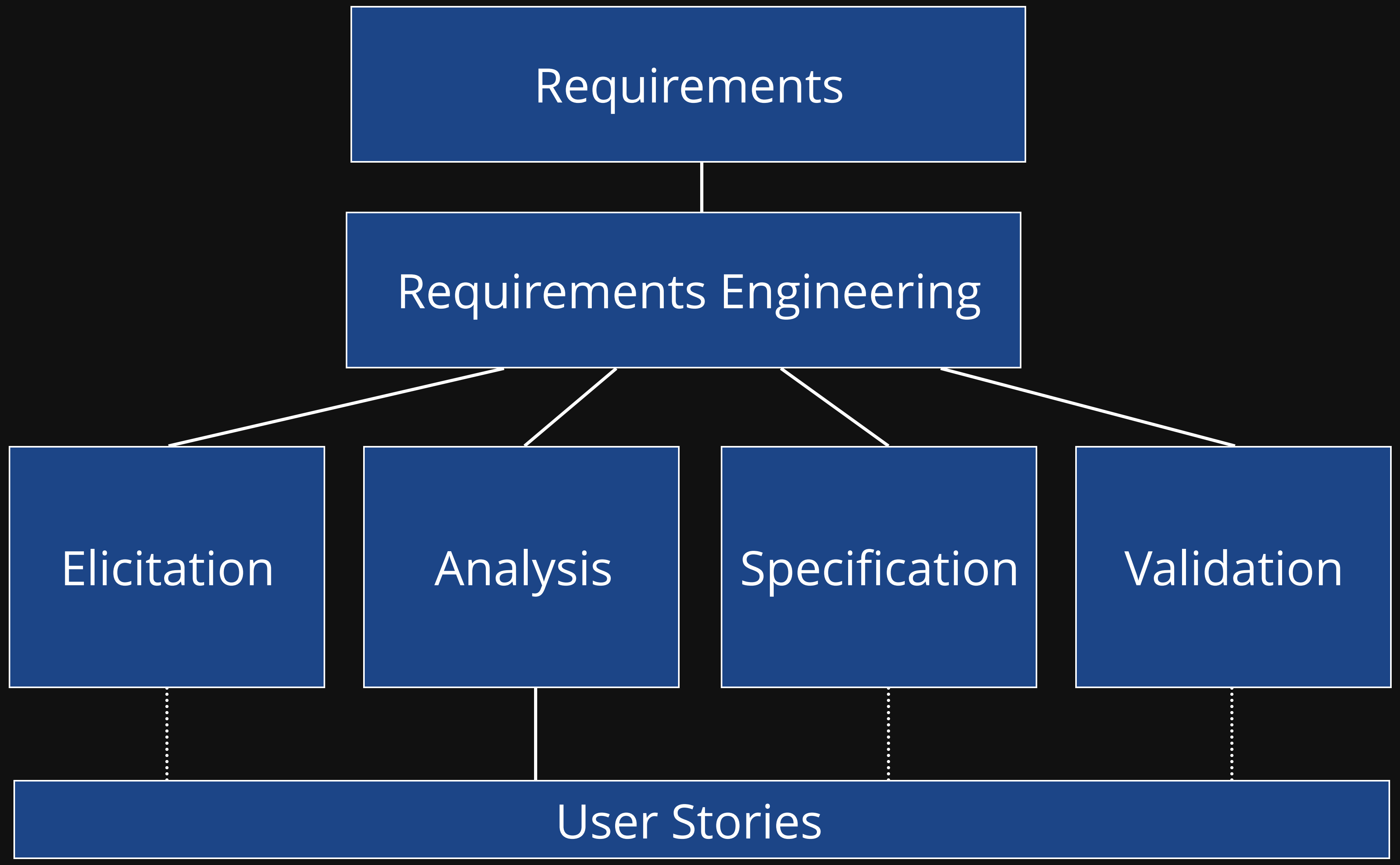
COMP1531

7.1 - SDLC Requirements - Overview

SDLC


SDLC PHASES
REQUIREMENTS ANALYSIS
DESIGN
MAINTENANCE
DEVELOPMENT
DEPLOYMENT
TESTING

Requirements



Requirements

Requirements Engineering

Elicitation

Analysis

Specification

Validation

User Stories

Requirements

IEEE defines a requirement as:

A condition or capability needed by a user to solve a problem or achieve an objective

We would also describe requirements as:

- Agreement of work to be completed by all stakeholders
- Descriptions and constraints of a proposed system

Functional v Non-Functional

Functional requirements specify a specific capability/service that the system should provide. It's *what* the system does.

Non-functional requirements place a constraint on *how* the system can achieve that. Typically this is a performance characteristic.

Great reading on the topic

Functional v Non-Functional

For example:

Functional: The system must send a notification to all users whenever there is a new post, or someone comments on an existing post

Non-functional: The system must send emails no later than 30 minutes after from such an activity

Requirements Engineering

We need a durable process to determine requirements

“The hardest single part of building a software system is deciding what to build. No part of the work so cripples the resulting systems if done wrong” (Brooks, 1987)

Requirements Engineering

Requirements Engineering is:

- A **set of activities** focused on identifying the purpose and goal of a software system
- A **negotiation process** where stakeholders agree on what they want. Stakeholders include:
  - End user(s)
  - Client(s) (often businesses)
  - Design team(s)

Requirements Engineering

Requirements engineering often follows a logical process across 4 steps:

1. Elicitation of raw requirements from stakeholders
2. Analysis of requirements
3. Formal specification of requirements
4. Validation of requirements

RE | Step 1 | Elicitation

Questions and discovery

- Market Research
- Interviews with Stakeholders
- Focus groups
- Asking questions "What if? What is?"

RE | Step 2 | Analysis

Building the picture

- Identify dependencies, conflicts, risks
- Establish relative priorities
- Usually done through:
  - User stories (discussed today)
  - Use cases (discussed next week)

RE | Step 3 | Specification

Refining the picture

- Establishing the right sense of granularity
  - There is no perfect way to granulate
- Often the stage of breaking up into functional and non-functional
- E.G. Try and granulate "The system shall keep the door locked at all times, unless instructed otherwise by an authorised user. When the lock is disarmed, a countdown shall be initiated at the end of which the lock shall be automatically armed (if still disarmed)"

RE | Step 4 | Validation

Going back to stakeholders and
ensuring requirements are correct

Challenges during RE?

What are some challenges we may face while engaging in Requirements engineering?

- Requirements sometimes only understood after design/build has begun
- Clients/customers sometimes don't know what they want
- Clients/customers sometimes change their mind
- Developers might not understand the subject domain
- Limited access to stake holders
- Jumping into details or solutions too early (XY problem)

Let's step through an example