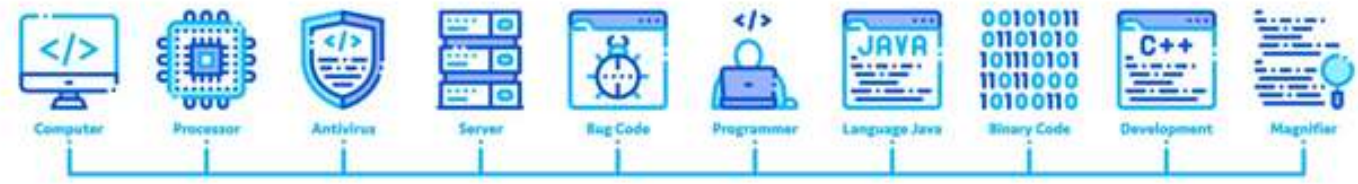
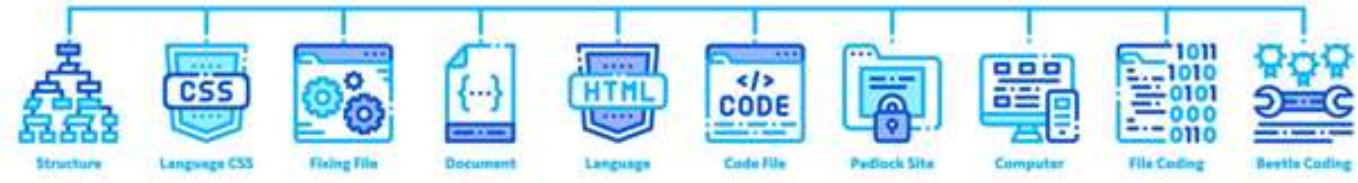


MODULE 2

SYSTEM DESIGN

CPE314



MODULE FOR SYSTEM DESIGN

Credits: **3 Units** (3 Hours Laboratory, 2 Hours Lecture)

Lesson Title:

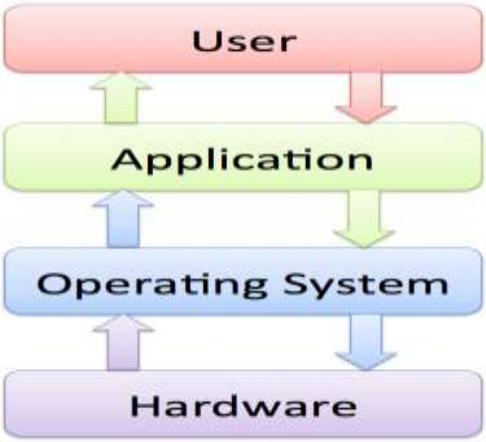
Lesson 2 – SOFTWARE DEVELOPMENT

- Challenges
- Software systems
- Documentation

References:

Hans -Petter Halvorse (2020)n Software Development A Practical Approach!
Dooley, J. F. (2017b). Software Development, Design and Coding. In Software Development, Design and Coding.
Featured, T. (2020). Approaches to software development
Gardner, T. (2015). Software development. In Historical Methods

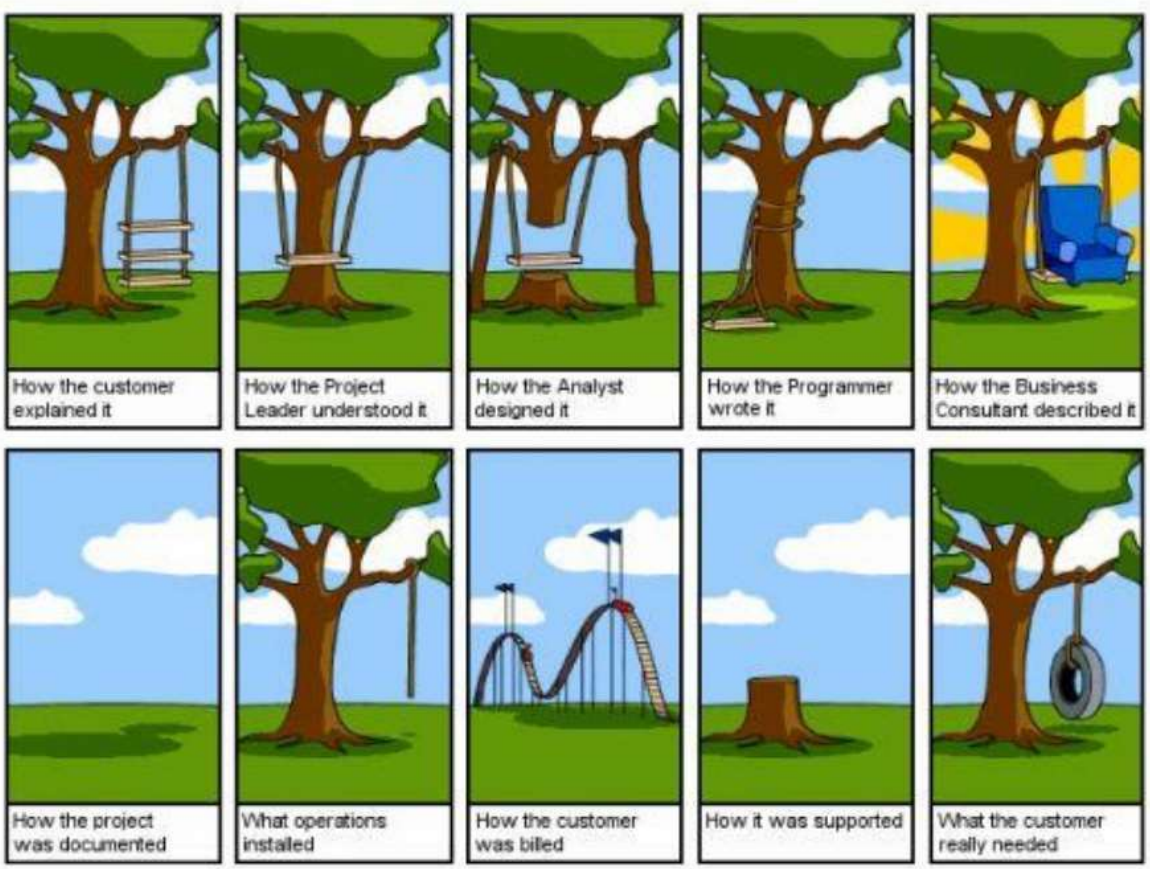
SOFTWARE DEVELOPMENT



Software Interaction with Hardware and Users

Challenges

Challenges can refer to a wide range of difficulties or obstacles that individuals, organizations, or societies face. These challenges can be in various domains and can vary greatly in nature and complexity.



Collaboration and communication within the team and with stakeholders, etc. is crucial when it comes to creating good software. Creating software is complicated. It is important to understand the customer's needs! In some way, you need to find out what the customer needs. Market research, etc. is a good start, but in the end, you need to go much deeper to understand the customer. Most of the time the customer doesn't even know what they need.

Software Systems

A software system, often simply referred to as software, is a collection of computer programs, data, and instructions that work together to perform specific tasks or provide particular functionalities. These systems are designed and developed to serve various purposes, from running applications on personal computers to managing complex operations in large organizations.

In software development we have different kinds of systems, such as:

Stand-alone application

These are application systems that run on a local computer, such as a PC. They include all necessary functionality and do not need to be connected to a network.

Interactive transaction-based applications

Applications that execute on a remote computer and are accessed by users from their own PCs or terminals. These include web applications such as e-commerce applications.

Embedded control systems

These are software control systems that control and manage hardware devices. Numerically, there are probably more embedded systems than any other type of system.

Batch processing systems

These are business systems that are designed to process data in large batches. They process large numbers of individual inputs to create corresponding outputs.

Entertainment systems

These are systems that are primarily for personal use and which are intended to entertain the user.

Systems for modeling and simulation

These are systems that are developed by scientists and engineers to model physical processes or situations, which include many, separate, interacting objects.

Data collection systems

These are systems that collect data from their environment using a set of sensors and send that data to other systems for processing.

Systems of systems

These are systems that are composed of several other software systems.

We can split the software systems in 2 main categories:

Generic products

Stand-alone systems that are marketed and sold to any customer who wishes to buy them.

Examples – PC software such as graphics programs, project management tools; CAD software; software for specific markets such as appointments systems for dentists

Examples: Microsoft Office, Operating Systems, Web browsers

Customized products
Software that is commissioned by a specific customer to meet their own needs.

Examples – embedded control systems, air traffic control software, traffic monitoring systems., Inventory management systems.

Documentation

In software management, documentation refers to the process of creating, organizing, and maintaining written or digital records that describe various aspects of a software project, its development, and its ongoing maintenance.

Some important documents are:

• SRS – Software Requirements Specifications

o A document stating what an application must accomplish

• SDD – Software Design Document

o A document describing the design of a software application

• STP - Software Test Plan

o Documentation stating what parts of an application will be tested, and the schedule of when the testing is to be performed

• STD - Software Test Documentation

o Contents: Introduction, Test Plan, Test Design, Test Cases, Test procedures, Test Log, …, Summary